

CHAPTER 5

Natural resources: use, access, tenure and management

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The significance of gathered or hunted resources to African livelihoods has received increasing attention in recent years. These are here defined as plant and animal resources, generally indigenous as opposed to introduced or 'alien' species, that are hunted, gathered or otherwise procured from the wider landscape rather than cultivated or husbanded close to homesteads and settlements. Although called 'natural' or 'wild', most have been influenced over millennia by African peoples utilising and inhabiting the continent's diverse landscapes.

Such resources are now recognised as conferring important benefits to their users and, for some, may be the primary sources of subsistence and welfare. Food security, for example, may be enhanced in several ways: through direct consumption of accessible 'wild' foods which, even in small quantities, may provide essential nutrients and diversify otherwise monotonous diets; through the sale or exchange of gathered products which increases purchasing power and the ability to obtain alternative foods (de Merode *et al.* forthcoming, a); and through holding trees as a form of 'savings bank', to be converted into income in response to unexpected contingencies (e.g. Chambers and Leach 1989; Barrow 1990: 168). Gendered dimensions of resource use mean that gathering may provide a source of independence and extra income for women who are often the primary collectors and processors of specific products. On the other hand, gendered associations between animal wildlife and men as hunters mean that the current plethora of schemes to increase local access to wildlife resources may focus on men as the recipients and obscure women's knowledge about the wider environment (e.g. Sullivan 2000). Infusing these utilitarian dimensions of resource-gathering are less tangible aspects of cultural identity and symbolism bound up with enacting resource-use practice, and

through which culture, tradition and identity are renewed and revisited (cf. Bourdieu 1990; Posey 1999).

This chapter discusses current issues pertinent to the use and management of indigenous biotic (i.e. biological or living) resources in East and southern Africa. We do not cover soil, water and mineral resources, or debates over farming systems and soil mining, rangeland management, or environmental 'degradation': for these see Chapters 6, 7 and 8 of this volume.

'Wild' plant and animal resources: biophysical determinants of availability

Land and habitat types in southern and eastern Africa are dominated by arid, semi-arid and subhumid vegetation types with varying degrees of woody vegetation cover. They include grasslands and savannas, wetland and riverine habitats, and forests ranging from dry deciduous woodlands to tropical montane, coastal and riverine forests. In contrast to the rest of the region covered by this volume, the Democratic Republic of Congo (DRC) is largely rain, riverine or swamp forest.

Patterns of occurrence and changes in these habitat or vegetation types are best predicted through three interlinked biophysical factors: soil nutrient and water availability; climate and seasonality; and biogeographical influences on the distribution of species. Fire and herbivory are also important in moulding and maintaining species assemblages and structural formations, particularly those with significant grass cover (i.e. grasslands and savannas).

Plant available moisture and nutrients (PAM and PAN)

The availability of soil moisture and nutrients for uptake by plants constrains the possibilities for productivity. In the drier areas water is the main determinant (Solbrig 1991). High moisture and nutrient availability (due to rapid nutrient cycling) make possible the forests of the DRC. At the other extreme, limited soil moisture and nutrients permit the dominance of ephemeral grasslands and shrublands, the species of which display a disjunct (i.e. discontinuous) distribution between the drylands of north-east and south-west Africa. Table 5.1 illustrates the interacting effects of these two variables.

Climate: effects of seasonality and aridity

Climate characteristics in eastern and southern Africa are discussed in Chapters 6 and 8 where the extreme significance of the amount of rainfall – and its seasonality and unpredictability – as a determinant of vegetation, agricultural and hydrological patterns is emphasised. Use of natural resources is one means of coping with this variability, whether as the basis

Table 5.1 Soil and water availability, and influence on vegetation types

	High water availability	Low water availability
High soil nutrient availability	High potential land. Mosaic of forest and other vegetation depending on land-use. Examples occur in the East African Rift Valley (fertile volcanic soils with orographic rainfall)	Seasonal pulse of very high primary production during rains allows seasonal influx of temporarily very high densities of migratory or transhumant grazers. For example the Serengeti short grass plains (on fertile volcanic soils in rainshadow area)
Low soil nutrient availability	Abundant water but poor soil nutrient supply means dense growth but low quality forage, hence low herbivore density. Dry season fires sweep through the mass of dry matter left standing, resulting in a fire-dominated ecosystem with fire-resistant grasses and trees. Examples include the <i>miombo</i> and <i>mopane</i> woodlands of Tanzania, Zambia, Malawi, Zimbabwe and Botswana, and the wooded 'elephant' grass stands of deforested interfluvial parts of the Congo Basin	Limited soil nutrients allow limited but nutritious forage growth during brief rainy season. Ephemeral and seasonal primary productivity allows limited seasonal influx of wild and domestic herds. Examples include the arid and semi-arid lands of the East African Sahel (e.g. north Kenya, southern Sudan, southern Ethiopia), Namibian <i>thornveld</i> , and northern Cape and Namibian succulent-dominated shrublands

Source: After Bell (1982).

of major production systems, or as irregular but proactive practices which capitalise on variable productivity to promote livelihood reliability (Roe *et al.* 1998). As such, natural resources constitute complementary elements in flexible and resilient networks of livelihood strategies. Understanding the ways that seasonality and the unpredictability of rainfall affect productivity and therefore resource availability in different parts of East and southern Africa is important for understanding patterns of human use of wild plants and animals.

Biogeography and biodiversity

Vegetation structure may be dictated largely by local soil and water conditions together with land-use patterns. Species composition of local vegetation, however, also depends on biogeographic factors. Following White (1983) and Davis *et al.* (1994), East and southern Africa incorporate seven major plant biogeographic zones or regional centres of endemism (RCE) and a further seven transition zones between these RCEs (see Table 5.2 and Figure 5.1). These affect the availability of resources useful to people. The species composition at particular locations is further affected by: species-area relationships, with larger areas normally having a richer species complement, all other things being equal) (Rodgers *et al.* 1982;

Table 5.2 Eastern and southern African phytochorological regions

<i>Phytochorological region (RCE) Regional Centre of Endemism</i>	<i>Dominant habitat</i>	<i>Total area (‘000 km²)</i>	<i>Total no. of plant species</i>	<i>No. of endemic species</i>
I Guineo-Congolian RCE	Evergreen and semi-evergreen rainforest	2,800	8,000	6,400
II Zambezian RCE	>95% savanna	3,770	8,500	4,590 (54%)
III Sudanian RCE	>95% savanna	3,731	2,750	910
IV Somalia–Masai RCE	90% savanna	1,873	4,500*	1,250 (31%, incl. 2 families and 50 genera)
V Cape RCE	Sclerophyllous thicket (fynbos)	71	7,000	1,250
VI Karoo–Namib RCE	Desert; the most extensive and distinctive shrubland assemblage	661	>7,000*	35–50% (incl. 1 family and 160 genera)
VIII and IX Afromontane and Afroalpine archipelago-like RCE	Montane grassland interspersed with forest patches	715	4,000	3,000 (75%, incl. 2 families and 200 genera)
X Guinea–Congolia/Zambezian regional transition zone	Forest with 20% savanna	705	2,000	Few
XI Guinea–Congolia/Sudania regional transition zone	Forest with 30% savanna	1,165	2,000	Few
XII Lake Victoria regional mosaic	Forest with 30% savanna	224	3,000	Few
XIII Zanzibar–Inhambane regional (coastal) mosaic	50% savanna	2,482	1,200	40
XIV Kalahari–Highveld regional transition zone	75% savanna	1,223	3,000	200
XV Tongaland–Pondoland regional mosaic	50% savanna	148	3,000	200
XVI Sahel regional transition zone	50% savanna	2,482	1,200	40

Note: Numbers of species and endemics are continually being revised as more research is undertaken, particularly in remote areas or in areas that have experienced protracted periods of conflict. Also, note that an alternative system is used in the IUCN *Directory of Afrotropical Protected Areas* (1987b): we have chosen to use the system established by White as this is probably more generic and widely acknowledged. *Source:* Derived from information on physiognomy or form, floristics or species assemblages, and physical environment, to designate major biogeographic zones (after White 1978, 1983; Scholes and Walker 1993: 12; Davis *et al.* 1994). Where figures in Davis *et al.* (1994) differ from White (1978, 1983) the former, as the more recent publication, are used and marked with an asterisk.

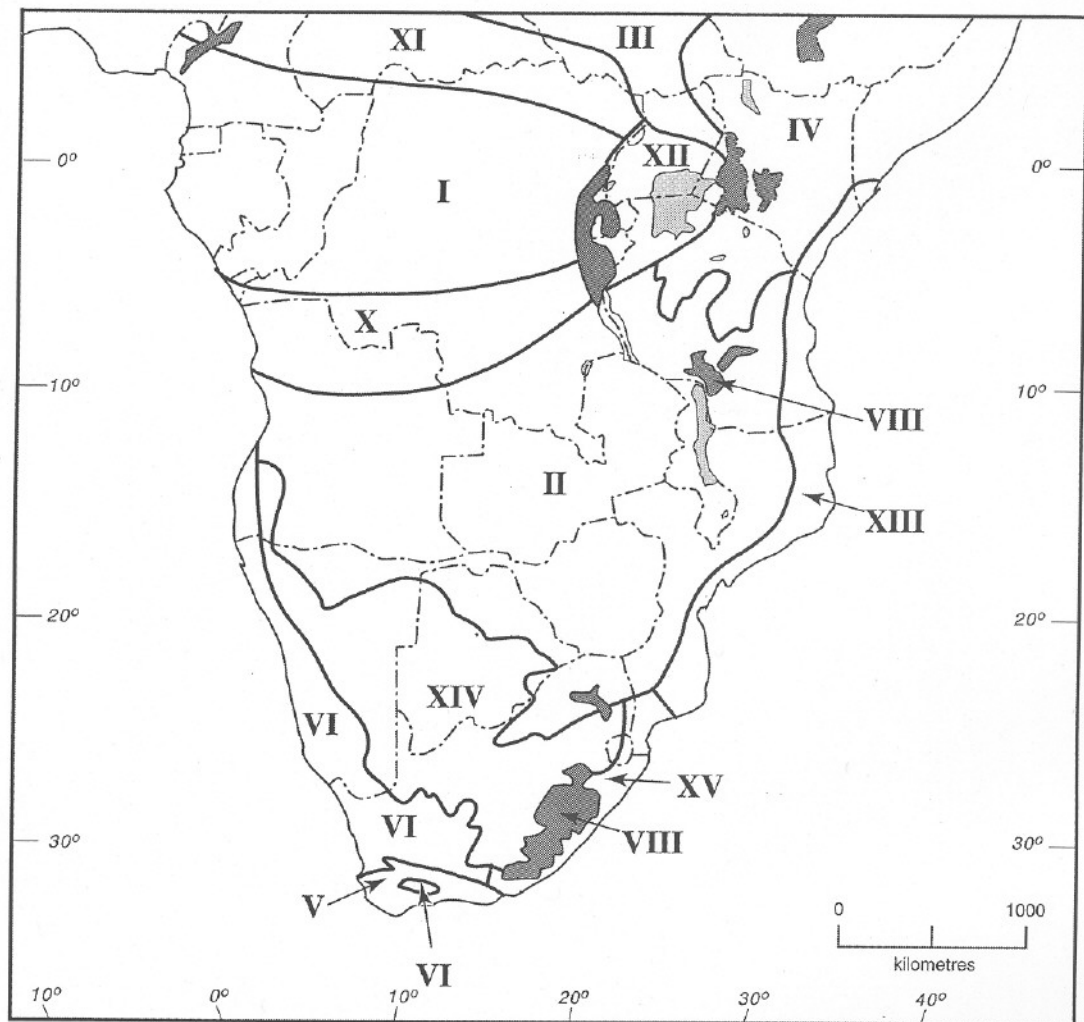


Figure 5.1 Main phytchoria of eastern and southern Africa
Source: White (1983: 38). For key refer to Table 5.2

Western and Ssemakula 1981); topographic and substrate diversity (e.g. Sullivan 1999a); and climate. In southern Africa, for example, the richness of woody edible plant species is strongly correlated with higher rainfall and lower evapotranspiration (O'Brien 1988).

As can be seen from Table 5.2, RCE zones II, III and IV with, to a lesser extent, zone VI, are dominated by a variety of savanna vegetation types. Savanna species of all taxa are generally widely distributed in contrast to their forest counterparts (Davis *et al.* 1994; Stattersfield *et al.* 1998). This means that, despite their considerable regional endemism, savannas are less likely to host site-endemic animal species than are forests. For example, of 23 African endemic bird areas, only the Juba-Shebelle valley, Somalia, is savanna (Stattersfield *et al.* 1998). For their individual and cumulative areas, therefore, forests represent sites of outstanding species richness and endemism and thus are of high conservation value. This is particularly true of the long-established forests associated with the Congo refuge in

the DRC¹ and of the block-faulted mountains of East Africa formed over 20 million years BP, including the Eastern Arc forests of the Usambaras, Ulugurus and Udzungwas ranges in northern Tanzania (Rodgers and Homewood 1982; Rodgers *et al.* 1982; Lovett and Wasser 1993; Myers *et al.* 2000). Forests on recent volcanic mountains in savanna areas, e.g. Mts Kilimanjaro, Kenya and Meru, tend to be less rich in terms of both species numbers and endemics. These patterns apply to a wide range of plant, vertebrate and invertebrate taxa and exist despite the considerable species richness of East African savannas.

Common uses of 'natural resources' and relevance for livelihoods

Several peoples conventionally classified as 'hunter-gatherers', including the 'Bushmen' of southern Africa, the Hadza, Dorobo and Ik of East Africa, and the Twa and Mbuti 'pygmies' of the Zaire Basin, retain a high dependence on, and knowledge of, natural resources, but also rely to varying extents on alternative sources of livelihood. 'Hunter-gatherers' have generally fared rather badly from movement into 'their' territories by cultivators and pastoralists, the imposition of colonial rule and the setting aside of conservation areas (e.g. Turnbull 1972; Wilmsen 1992; Lewis and Knight 1995; Hitchcock 1996; Simpson 1997; Gordon and Sholto Douglas 2000). It is important not to perpetuate popular representations which may romanticise their 'hunter-gatherer' lifestyle and present these people as 'in harmony' with, and dependent on, their immediate environment, when in many (if not all) cases their natural resource use practices have been extremely circumscribed. Furthermore, automatic presumptions that social and economic 'development' for these peoples should revolve around 'hunting and gathering' can be problematic – such decisions preferably should lie within communities themselves.

More generally, the hunting and gathering of wild resources, including specialist resource extraction such as honey-harvesting and charcoal production, are elements of many major production systems in the region which are normally classified as agriculture or pastoralism and/or agropastoralism. Commercial use of natural resources, particularly wild-life hunting and/or wildlife viewing based enterprises, are also significant in the African context. The uses of different natural resources are often intertwined, either as they are procured and/or consumed, or because the resource can fulfil many functions (e.g. nutritional, curative, cosmetic, symbolic). This makes it difficult to construct an effective typology of resources or their uses without excluding the complexities of the roles

¹. 'Refugia' are areas that act as core and continuous habitat 'islands' for species when environmental change causes extinctions to occur through the contraction of surrounding habitats.

they play in people's livelihoods (see Box 5.1). Below we introduce some resources and their uses under the broad categories of 'non-timber plant products', 'timber' and 'animals', our logic being that these categories are broadly different ecologically, affecting both the type and impacts of harvest practices, as well as embodying some coherence regarding uses within these categories.

Box 5.1 Categories and complexities in the uses of gathered plants by Damara herders in north-west Namibia

The following examples of plant use by Damara herders in north-west Namibia (see Figure 5.2) indicate how simple classifications may overlook much that is significant concerning natural resources.

1. Many items apparently consumed as food or beverages are considered to have other beneficial values, making their categorisation problematic and frequently misleading. For example, the flowers, leaves and stems of the herb *Thamnosma africana* (*khanab*) may be consumed as a herbal tea, but a stronger brew (or decoction) is used to treat a variety of complaints, from coughs to menstrual problems. This herb also is a component of perfume or *sâi*, a fine powder of aromatic plants which is made, used and traded by women and which has complex symbolic as well as cosmetic values. Similarly, stems of the succulent plant *Hoodia* spp. are consumed as food but also are considered to lower blood pressure and to prevent mosquito bites, while *Stipagrostis* spp. grass seeds are consumed as a nutritious porridge-like food but are also used in the production of beer and liquor, which provide an important source of cash income for many women.
2. Complications also arise over the categorisation of gathered items as 'wild', a label that frequently obscures the investment that people make in controlling or otherwise ensuring the future productivity of such resources. For example, many leafy species are left growing as weeds in cultivated fields because their leaves provide a nutritious source of 'relish' to add to starchy staples. In the settlement of Sesfontein, north-west Namibia, seeds of the wild spinach *Amaranthus* sp. have been planted in people's gardens, having been brought to the settlement by Owambo men from the wetter areas of north-central Namibia who have married into Damara families. *Amaranthus* spp. also grow 'in the wild' in the environs around Sesfontein. Both sources of spinach are harvested and consumed by people in the settlement. Similarly, although the consumption of stems of the spectacular and near-endemic succulent *Hoodia* spp. (see above) is the cause of some concern among conservationists, Damara people also frequently plant this species around their homesteads and in their gardens. They can be seen, therefore, as propagating, as well as harvesting, this valued species.

Source: Sullivan (2000).

Non-timber plant products

Of the range of natural resources utilised, non-timber plant products, i.e. fruits, nuts, seeds, leaves, flowers, stems, gums, and underground plant parts such as bulbs, corms and tubers, are frequently the dominant sources of 'wild' foods and medicines, both in terms of quantity of product and diversity of species consumed.² While it may be rare today to find people relying solely on gathered plants for food and/or medicine, non-timber plant products are frequently important complements to foods and medicines procured from elsewhere (i.e. cultivated crops, husbanded animals or shop-bought).

Gathered foods, for example, are not often consumed as staples.³ Instead they contribute essential nutrients and diversity to frequently starchy and monotonous diets. They may also confer nutritional success under circumstances where food provision is unpredictable (Grivetti 1978). This is the case for many indigenous fruit species, which often contain greater quantities of vitamin C than domesticated species (e.g. Wehmeyer 1986: 8). These are often consumed when encountered on common land in rural areas (e.g. Maundu 1987), which means that their dietary contribution may be missed by household diet surveys. Similarly, wild spinaches (e.g. *Amaranthus* spp.), which grow as weeds in cultivated plots, are high in proteins, minerals and vitamin A and are consumed throughout East and southern Africa (e.g. Fleuret 1979; Zmarlicki *et al.* 1984; Ogle and Grivetti 1985; Kiwasila and Homewood 1998). Underground plant parts, on the other hand, may have high energy quantities and are particularly important dry season foods for people inhabiting drier areas of the subcontinent (e.g. Heinz and Maguire 1974; Grivetti 1979). Herbs consumed as teas also may contain important minerals (e.g. Wehmeyer 1986: 29).

Plant products frequently form the basis for indigenous medical treatments, particularly for household remedies for common illnesses but also for medical practices based on the sympathetic or magical properties of plant items (Maundu 1987; Maundu *et al.* 2001). The use of plant products in the treatment of livestock diseases is particularly important among pastoralist societies (e.g. Malan and Owen-Smith 1974; Fratkin 1996). Many medicinal plants contain active chemical compounds which also make these plants aromatic and popular for use as perfumes and cosmetics (e.g. Sullivan 2000).

Finally, as rainfed cultivation is unreliable in some two-thirds of southern and East Africa there is a strong dependence across extensive areas

² For general references documenting uses of non-timber plant products in various regions of East and southern Africa see, for example, Getahun (1974); Brokensha and Riley (1980, 1986); Benefice *et al.* (1984: 241–2); le Floc *et al.* (1985); Storey (1985); Becker (1986: 61); Campbell (1986); FAO (1986); Gura (1986); Malaisse and Parent (1985); Stiles and Kassam (1991); Sullivan (1998, 2000, forthcoming 2003).

³ Although see Lee (1973, 1979), Bieseke *et al.* (1979), Peters (1987) and Widlok (1999) for documentation of the continuing importance of the staple food *mangetti* – nuts from the tree *Schinziophyton* (formerly *Ricinodendron*) *rautanenii* – among 'Bushmen' populations in Botswana and Namibia.

on animal production (domestic livestock and/or wildlife) using natural forage. Unlike commercial ranches, where beef production under private ownership on the western European model tends to be the goal, African pastoralists employ a number of strategies in order to capitalise on the vagaries of rainfall-driven primary productivity and which make use of a wide range of indigenous plant resources as forage for domestic livestock. These strategies include mobility (trans-humance and nomadism), in order to utilise pastures when and where they become available and to avoid seasonal disease outbreaks, and the utilisation of browse (e.g. leaves and pods from woody plants) as well as grassy pastures (e.g. Sandford 1983; Homewood and Rodgers 1991; Scoones 1994; Niamir-Fuller 1999).

Timber

The majority of people in rural Africa rely on timber for fuelwood and building materials: for example, over 90 per cent of Malawi's energy needs are met by fuelwood (Moyo *et al.* 1993: 98; also see Bradley 1991). The utilisation of indigenous woody species for these purposes has evoked concern among foresters and the conservation fraternity, although in some areas of West Africa it appears that local uses of woody plants have actually promoted secondary growth and the expansion of forested areas (e.g. Fairhead and Leach 1996, 1998). Frequently, negative impacts on woody species in rural areas are associated with requirements for fuel and charcoal for commercial purposes (e.g. Box 5.2; see also Ribot 1998) or in urban areas. In rural areas, and particularly drylands where woody biomass is low, measured fuelwood and building timber consumption tends to be rather conservative and is often lower than estimated rates of use (e.g. Barnes *et al.* 1984). For example, a small survey of Damara households in arid north-west Namibia in 1996 found that only 0.105 m³ of wood per capita per year was used (Sullivan 1998), well below the average rate of 0.5 m³ per capita per year for 'arid and sub-arid' areas of Africa (FAO 1981 cited in deLucia 1983: 9). Timber is also important for the production of household utensils such as mortars and pestles. In recent decades this has generated concern regarding the sustainability of an increasing use of high-quality and slow-growing hardwoods for the production of carved curios for tourists.

Animals

The consumption of 'bushmeat' – the meat from wild animals – has commonly been viewed as driven by a nutritional need for protein (e.g. Eltringham 1984), although this may be somewhat misleading as human daily protein requirements are surprisingly low and relatively easily met from alternative sources (e.g. plant proteins, invertebrates, fish). Where the tsetse fly challenge is endemic (causing trypanosomiasis in cattle and sleeping sickness in people), domestic livestock (and thus the protein from their milk and meat) have been limited until recently.⁴ The consumption of animal protein from hunted wildlife has thus been particularly

Box 5.2 Fuelwood extraction and canopy loss in Lake Malawi National Park

Tropical dry woodlands throughout the world are thought to be declining due to human activity, particularly domestic requirements for fuelwood and building poles. In a recent study of vegetation changes in Lake Malawi National Park during 1982–90, aerial photograph analysis showed measurable conversion of closed canopy *miombo* to sparse woodland. This study used a multidisciplinary approach to investigate possible contributions to these changes by the domestic use of fuelwood and construction poles, and by the requirements of fuelwood in fish-smoking for commercial sale.

Domestic fuelwood use was measured in 30 households in each of 2 enclave villages over 12 and 5 months respectively. Domestic fuelwood use consumes a large biomass of mainly dead wood and small branches with a wide species range. Mean total annual domestic fuelwood consumption by the total enclave population was less than half the mean annual deadwood biomass production in the park, estimated from three quadrats harvested monthly over a year. In other words, the domestic consumption of fuelwood was low compared to the availability of this resource.

Construction poles were mostly small, have extended durability and come from a broad species range. Fencing poles commonly take root to form live hedges and *Eucalyptus* trees are grown for poles. Construction pole use thus appeared sustainable and also showed signs of substitution for indigenous species.

The 305 commercial fish-smoking stations in the enclaves used a relatively lower mean annual fuelwood biomass than domestic fuelwood consumption, but targeted large branches and logs from a narrow species range and therefore involve destructive felling of canopy species. Unlike domestic fuelwood collectors (normally women), 95 per cent of men collecting fuel for fish-smoking used cutting tools and three-quarters transport the wood by boat or bicycle.

The scale, size classes and species involved in commercial fish-smoking suggest that it is this activity which is driving vegetation changes from closed canopy to sparse woodland and *not* domestic uses of fuelwood as is generally assumed. Traditional local fishing previously focused on small fish species sundried for preservation. Commercial fish-smoking, introduced relatively recently by in-migrants and utilising gill nets which harvest larger fish, requires smoking for preservation. Seventy per cent of commercial fish-smoking stations were owned by northern in-migrants. At the same time the increasing demand for fish by a growing urban population underpins the continuing growth of the fish-smoking industry.

The disaggregation of different wood-use practices should allow informed management policy for the park. At the time of the study management targets and penalises domestic fuelwood collectors. While seeking to reduce demand and provide alternative fuelwood sources, law enforcement and forestry extension should be reoriented to address the extraction of fuelwood for fish-smoking.

Source: Abbot and Homewood (1999).

important in these areas (e.g. Child 1970; Butyinski and Von Richter 1974; de Merode *et al.*, forthcoming a and b; see Box 5.3). Under recent and contemporary circumstances, however, it has been rather difficult to ascertain the continuing significance of animal wildlife products for local livelihoods. This is because local people's hunting of wildlife was largely criminalised under colonial regimes throughout East and southern Africa through the institution of game laws and the establishment of protected areas from which local people were excluded.

Despite the criminalisation of wildlife hunting, studies of bushmeat consumption indicate that bushmeat can constitute an extremely high-value commodity, underpinning local livelihoods but also moving through far-reaching commodity chains to be sold to urban elites, sometimes across international borders (see Box 5.3). The monetary value of bushmeat tends to vary according to species (e.g. generally small-bodied species are of low value and vice versa), cultural preferences and whether the meat has been procured legally or not. Put simply, there are two extremes of illegal hunting practice (commonly known as poaching). First, there is hunting carried out by local people for their own consumption or local trade and exchange, using low-tech methods (e.g. snares) which target smaller-bodied species, and producing relatively low returns with low impacts on the animal resource (e.g. Butyinski and Von Richter 1974). Second, is hunting for commercial profit by highly organised operators, frequently outsiders using high-tech weapons (e.g. automatic rifles), who pursue large-bodied species with high commercial and conservation values (e.g. elephant), and transport the products of their hunt to locations far from the source of species. One of the main challenges for conservation practice in the wildlife-rich areas of Africa is to find a way of policing and preventing the latter, while accommodating the legitimate needs of the former (e.g. Child 1970, 1984; Chabwela 1990).

Wildlife-based enterprises have also remained attractive to European settlers in East and southern Africa for both economic and cultural reasons. Economic, because in circumstances where settlers have inalienable rights to large tracts of land (i.e. freehold tenure) and to many of the wildlife resources on that land, the possibilities exist for profit-making through game cropping, trophy hunting and/or non-consumptive tourism based on game viewing and the provision of accommodation in game lodges. Cultural, because constructions of an expatriate and usually masculine identity linked economically and psychologically to hunting tend to be inextricably bound up with the spectacular wildlife of large mammals for which East and southern Africa are famed (e.g. MacKenzie 1987; Ellis 1994; Carruthers 1995; Skidmore-Hess 1999; Wels 1999).

⁴ Although note that pastoralism – the herding of domestic livestock – has been significant in Africa for millennia. At the onset of colonial rule towards the end of the nineteenth century, livestock herds were generally much smaller than they had been previously, and the tsetse-infested areas larger. This was due to the rinderpest epidemic of the 1890s (among other factors) which decimated livestock herds by 90 per cent in many areas, and also reduced wildlife populations substantially. In other words, the limited extent of livestock herding and the extended areas of tsetse observed during the twentieth century until recently may be partly an artefact of this disease event (e.g. Bell 1987).

Box 5.3 Wild resource use among the Zande in Kiliwa, Democratic Republic of Congo

In 1996, a 24-hour dietary recall survey of 128 households giving 1,245 'diet-days' over a 5-month period showed that gathered plants, fish and wild meat or 'bushmeat' made up 15–20 per cent of the total market value of Zande household diets in Kiliwa. Analysis of wild food use with respect to wealth indicated the following patterns:

- while plant foods are important in the diet of poor households, these families eat little bushmeat;
- wealthy families consume more wild meat as well as most of the fish recorded during the survey;
- the bushmeat eaten by the rich generally is purchased or received as gifts from poorer households, although in some cases it is derived from recreational hunting.

In the collapsing DRC economy, therefore, wild meat seems to represent a source of income for the poor and a source of prestige protein for the wealthy.

Bushmeat is a high-value commodity, extracted by both local farmers and hunters and by commercial hunters who supply a strong urban and even international demand. The commodity chain of which it is a part is regulated by various networks of power and control, i.e. through: local chiefs; local, regional and national government officials; the military; and, importantly, wealthy patrons who bankroll hunters' firearms and ammunition, as well as giving middlemen and women traders a degree of protection and/or 'official' licence to trade.

Some wild meat consists of legally hunted prey (e.g. cane-rats or duikers) apparently harvested sustainably from *domaines de chasse* (i.e. buffer zones surrounding protected areas where hunting of non-restricted species is allowed), or snared on farmers' plots. Large quantities of commercially marketed meat, however, come from officially protected species (e.g. elephant) which are harvested illegally from protected areas (such as Garamba National Park in the north-east of the country, see Figure 5.2). Severe penalties, including shoot-to-kill conservation policies, have little impact because people's livelihoods are so precarious and income-earning possibilities so few. Enforcement is hampered by the lack of a legal framework of any relevance to rural resource users. Given both the prestige attached to various wild foods, and the role that these can play in supporting the livelihoods of the poor, this study suggests that the consumption of wild food and particularly of bushmeat is unlikely to decline in the DRC, whether future economic change is positive or negative, both nationally and for local people.

Source: de Merode (1998).

Trophy hunting and wildlife viewing by tourists have become major sources of foreign exchange for governments and entrepreneurs in eastern and southern Africa (Cumming 1990; Hulme and Murphree 1999). Although demand fluctuates because of political, security and health scares, the market for wildlife viewing and hunting is surprisingly lucrative (e.g. Leader-Williams *et al.* 1996). Returns to local communities, however, tend to remain rather low, as discussed below. Wildlife cropping, ranching and domestication have been less successful enterprises (Eltringham 1984). Commercial cropping, which involves culling wild animals from 'natural' environments, appears attractive because it seems as though one can make money from an essentially 'free' good. In fact, because there is frequently little infrastructure in areas suitable for wildlife (e.g. roads, water provision, storage facilities, abattoirs), there are serious logistical problems in producing meat of commercially acceptable quality. The use of fixed facilities is also problematic due to the fact that wildlife tends to be mobile and seasonally migratory. Experience shows such commercial enterprises are unprofitable unless: they take trophy animals; operate in national parks or on ranches where access is easy; hygiene restrictions are waived; and/or hunting is subsidised. If the motivation driving commercial hunting is to provide local people with more animal protein, then arguably it makes more economic sense to allow them to hunt for themselves (e.g. Eltringham 1984; also Box 5.3). Game ranching and the domestication of wild animals (e.g. Carles *et al.* 1981) involve substantial inputs for fencing, supplying forage, water, mineral licks, veterinary care and for removing predators. Recent animal health problems have also meant products face major restrictions on export to European Union and other countries. In other words, the associated costs mean that often there are few economic advantages to keeping wildlife as opposed to livestock.

Invertebrates

Invertebrates are usually little mentioned when the consumption of animals is discussed in the literature. This reflects not only cultural preferences but, frequently, also distaste on the part of donors (who often dictate the direction of research) (Speight *et al.* 1999: iii) and other 'outsiders'. Insects, however, often comprise an important nutritional contribution to local diets in terms of energy, minerals and vitamins. Caterpillars, for example, primarily the larval stages of various emperor moth species (Saturniidae), are 'the most commonly utilised food insects in Southern Africa' (Marais 1996: 1–2; also Grivetti 1979; Silbauer 1981: 217; Mkanda and Munthali 1994; Sullivan, forthcoming 2003). Nutritionally they are extremely valuable: for example, 100 g of dried mopane worm (*Imbrasia belina* Lepidoptera: Saturniidae) provides 76 per cent of an average person's daily protein requirement and 100 per cent of the daily requirements for many vitamins and minerals (Speight *et al.* 1999: 21). As such significant food items they form the basis for a lucrative informal trade.⁵ The products of insects also may be significant, as with the harvesting of honey from wild

⁵ Analysis of data in Marais (1996: 8) suggests a mean return of US\$4.19/kg for primarily *Imbrasia belina* (Lepidoptera: Saturniidae) caterpillars traded in Windhoek, Namibia, in May 1996.

and/or set hives of the honey-bee (*Apis mellifera*) (Brokensha *et al.* 1972; Grivetti 1979; Ntenga and Mugongo 1991; Cunningham 1996; Kiwasila and Homewood 1998; Sullivan 1999b). To give some idea of the potential scale of this resource, it has been estimated that in 1997 there were 52 hives per hectare in Ethiopia, 43 in Kenya and 28 in Tanzania (Speight *et al.* 1999: 15). Income derived from honey is also significant in Malawi for both commercial and subsistence farmers (Mkanda and Munthali 1994).

Fish

As suggested by the livelihoods explored in Boxes 5.2 and 5.3, fish are also important for both direct consumption and income generation. For example, although landlocked, about 6 per cent of Zambia's surface area is under water with more than 150 species of fish supporting both commercial and subsistence fisheries (IUCN 1987a). Frequently, fisheries interact with uses of other natural resources, as illustrated for Malawi in Box 5.2 where fuelwood is important for fish smoking. In some places (e.g. Zambia and Malawi) the introduction of alien fish species to increase productivity and support trophy fishing unfortunately had serious adverse effects on native fish populations (Stuart *et al.* 1990: 134, 232). Coastal marine fish resources similarly are known to have constituted significant food resources for millennia. Coastal archaeological sites focused around shellfish middens suggest that shellfish was a staple food, at least for particular periods (e.g. Kinahan 1991). These resources remain important today (e.g. Hockey *et al.* 1988).

Tenure and access rights

Tenurial arrangements in the region include both indigenous and introduced forms. Indigenous, or customary, tenure and resource access rights in eastern and southern Africa encompass a wide range of rights. These include strict controls approximating private and individual ownership; collectively managed resources known as 'common property'; 'open access' resources with little or no control over access or use; and state-owned property where individuals are liable to prosecution should they transgress legal guidelines determining access and use. These categories are not static, either geographically or historically, but they comprise a useful typology for discussion of the different types of tenure influencing the way in which African natural resources are used (Toulmin and Quan 2000).

Private ownership

In general, the higher and more predictable the productive potential of land and/or specific natural resources, the more likely they are to come under strict control over access and use. These sorts of resources and access rights would include:

- Land that is vested in, maintained and inherited by individual families, households or lineages, usually delineated as fields under cultivation

or fallow. This type of tenure is characteristic of farmland under forms of rainfed arable cultivation in much of southern and East Africa. Examples are delineated fields cultivated by farmers in the mountainous areas of Meru and Arusha in Tanzania (Spear 1997) and delineated and inherited fields on Swazi Nation Land in Swaziland (Dlamini 1989). In these contexts, ultimate customary ownership of land and resources rests with the collective group associated with an area, under the control of the traditional leadership: thus the individual farmer or household is not in a position to alienate land from the group in the long term, even where land may be inherited over more than one generation (e.g. Dlamini 1989).

- Individual ownership of trees with both commercial and subsistence values. Examples include gum arabic acacias (*Acacia senegal*) in north-east Africa or fruit trees left standing on land otherwise cleared for cultivation (Wilson 1989).
- Personally constructed wells for the provision of water (Lewis 1961).
- Beehives: these may be constructed and set by harvesters – for example, Pare farmers living around Mkomazi Game Reserve in northern Tanzania (Kiwasila and Homewood 1998) – or may occur in the ‘wild’ but be considered ‘owned’ by individual harvesters, generally men (Sullivan 1999b).
- Other ‘patches’ of valued resources. In north-west Namibia, for example, harvester ant nests, from which large quantities of grass seeds can be collected, may be thought of as the property of individual harvesters, usually women (Sullivan 1999b).

The idea of resources as completely private property is generally associated with the imposition of European concepts of ownership and tenure as recognised under Roman or formal law. This was instituted under colonial, or white settler, rule in most countries. This frequently led to the expropriation of large areas of high potential land for private ownership, particularly where settler populations were significant, as in South Africa, Namibia, Zimbabwe and Kenya. Such expropriation was based on denial of the proprietary character of ‘common land’ under African management and ownership (Okoth-Ogendo 2000). In the remaining areas where residence and use by Africans were permitted, usually the land was, and largely remains, legally owned by the state but is utilised and allocated under communal (i.e. locally administered) forms of tenure. In higher rainfall regions, for example KwaZulu-Natal in South Africa, many of these areas are under smallholder arable farming with farm plots being passed down through the family. Under these circumstances, resources occurring outside of farm plots (such as grazing land and other plant and animal resources) tend to be used and managed as common property resources (see below). Following independence and transition to African rule, some of the land expropriated by Europeans has reverted through land reform to land-poor Africans (for example, in Zimbabwe and Namibia). More commonly, however, private ownership of such estates has been either retained by settler farmers or passed to a new generation of elite, African landowners (e.g. Galaty 1999a; see Box 5.4).

Box 5.4 Land tenure and subdivision on Maasai group ranches, Kenya

Lemek group ranch near the Maasai Mara (see Figure 5.2) in Kenya (745 km²) was established in 1969. The group ranch chairman and land adjudication committee allocated land to educated or influential Maasai in a belt along the western portion of the group ranch boundary bordering the Mara River. These allocations were cemented under private ownership with the issuing of title deeds, the process being facilitated by the local administrative chief and land registry staff. Ostensibly to guard against the continued westward movement of non-Maasai cultivating groups onto Maasai lands, beneficiaries included Maasai administration chiefs, MPs, councillors, county council officials and a police inspector. Ironically, many of these new landowners rapidly sold land on a piecemeal basis to the same in-migrant cultivating groups apparently causing concern to Maasai pastoralists.

On the northern portions of Lemek, outside entrepreneurs, since 1984, have been approaching the administration chief and group ranch chairman to cultivate wheat on leases of upwards from 2,000 to 4,000 acres per contractor. In addition to arranging these leases for their own benefit, the administration chiefs and chairmen have been giving responsibility to other group ranch committee members, councillors and associates to arrange leases with contractors. On subdivided land on Lemek, each registered member was supposed to be entitled to receive 100 acres of land (in fertile places) or 128 acres on steeply sloping or marshy areas. The process of registering involves all circumcised men deemed to have been resident on the group ranch by the land adjudication committee prior to the closing of the register in 1993. According to the Narok County Council there were 1,021 registered members on Lemek. Initial attempts by local elites to allocate larger shares to themselves were thwarted in 1995 when, under the supervision of the district commissioner, a revised survey was undertaken to ensure plots were of equal size.

Despite this, locally influential people (with access to the register and map providing the location of the plots) have still been able to exercise control for personal benefit of the land subdivision process. Examples include:

- Those previously involved in leasing land for wheat cultivation using the considerable sums generated to buy the permanent/modern houses constructed by contractors. Once owners of the permanent housing, their stake to the land on which the house is located is secure, thus ensuring a position in the lucrative wheat-leasing belt.
 - Those involved in leasing out the land for wheat farming use the money accrued to buy out poorer neighbours' shares in land. Once agreement has been reached (usually a handwritten confirmation signed or marked with a fingerprint) the position of the selling party's land is changed to ensure it is located on the wheat belt.
 - Influential people registering their younger (uncircumcised) sons and ensuring that the shares are located adjacent to each other in the wheat belt.
- In this way, farms of up to 1,000 acres in extent are established.

All of these facilitate the further consolidation of land in the hands of the wealthy, while excluding poorer land-users whom the subdivision process is ostensibly intended to benefit.

Source: Thompson and Homewood (2002).

Common property resources (CPRs)

Indigenous or customary land and resource tenure throughout Africa often involves various forms of collective ownership. In these circumstances a clearly defined group collectively own, manage and have access to a specific resource, with the group establishing and enforcing rules of access and use. In CPR systems, a leader, chief or elite group such as a committee of elders, commonly acts as custodian(s) of the land or other CPRs, in the sense of presiding over allocation, regulating access and resolving disputes that may arise. Sometimes these allocative powers are exercised, at least in theory, by elected 'committees' of some sort (e.g. in Zimbabwe although here the powers of the chiefs were strengthened again in the 1990s). Local hotspots of productive potential (for example, wetlands in drylands, or highland drought refuges), while being common property, may fall under the control of a dominant group with the power to exclude others or exact payment for use of the resource.

As mentioned above, areas of uncultivated land between villages or fields are often held and used on a common property basis. For example, seasonally waterlogged grasslands, (known as *vleis* in some parts of southern Africa and as *dambos* in, for example, Malawi and parts of Zambia) are areas that sustain grasses collected for thatching, and which often play an important role as dry season grazing resources (Scoones 1991). In contexts where land is relatively abundant, fields and plots also may be allocated as a CPR such that plots are designated to be worked by particular individuals or households for one or more farming seasons, or until the household head has died, after which it reverts to the pool of common land for reallocation (Birley 1982).

As a general rule, the more arid and infertile the land, and the more seasonally and annually variable its productivity and ensuing use, the more likely it is that the area and its resources will be under communal control rather than individual tenure. This makes common property regimes typical of the tenure system of indigenous pastoralists in East and southern Africa, for whom movement with livestock herds is essential in order to access forage and other resources. Common components of CPR management by pastoralists include:

- Management of a dry season grazing area, often with a committee of elders who decide when and where to reserve, or allow access to, dry season grazing. This system has been well documented for the Tanzanian Maasai (e.g. see Potkanski 1994; Brockington and Homewood 1998).
- Sophisticated collaborative management, of both the timing of herd access and the coordination of labour, to enable group access to shared water sources. A good example can be found among the Borana pastoralists of southern Ethiopia (see Cossins and Upton 1987).
- Negotiation of group access to other 'key resources' – local 'hotspots' of productive potential. For example, access to and inheritance of riverine tree resources for dry season forage is managed by Turkana pastoralists in north Kenya (Barrow 1988, 1990, 1992).

The mobility practices of both pastoralist and hunter-gatherer peoples, and the consequent apparent 'vacancy' of 'their' land when they are elsewhere, leaves them open to land dispossession due to pressures from elsewhere. This was a common mode of land loss to European settlers during the colonial period. A more recent case occurred when Barabaig pastoralists in Tanzania were displaced from communally held pastures and ancestral grave sites to accommodate a vast wheat-growing programme sponsored by Canada. The assumption on the part of donors was that the land had been standing 'idle' (Lane and Pretty 1990: 7). For so-called 'hunter-gatherers', and despite conventional stereotypes of their relentless mobility and their inability to recognise land and natural resources as belonging to any individual or group, a number of anthropological studies indicate complex conceptualisations of access and tenure rights. Like cultivators and pastoralists, these are mediated via kin relations and rules guiding inheritance (see Box 5.5). Relating this point back to the issue of how their use of natural resources in their livelihoods has been circumscribed by encroachment on their lands, a priority for 'hunter-gatherer' livelihood and security today is the development of very clear, and legally enforceable, rights over their land and resources. Often this means the reinstatement of theoretically existing rights conveniently ignored by other, encroaching groups. Other policies relating to natural resources involving indigenous knowledge or sustainable offtakes, while evidently fashionable, are actually less important. In any case, they are unlikely to be effective if hunter-gatherer rights are generally being sidelined.

A second and related source of pressure for those requiring access to spatially and temporally dispersed resources is the imposition of private forms of land tenure, usually accompanied by the delineation of land areas using fencing. In extremely broad terms, this may occur in two contexts. First, due to formal land tenure reform at the level of national policy, based on assumptions guiding farming practices for commercial markets (e.g. Birley 1982; Rohde *et al.* 2001). In this case, land enclosure is associated with capital-intensive, commercialised production for export markets and, as such, has usually been associated with European settler farmers producing items for single product markets. In the livestock sector, for example, the production of meat for export markets becomes a primary objective and is based on low stocking rates per unit area of land and the regular harvest of a surplus 'crop' of young cattle for meat. An assumption here is that inalienable title to land will increase investment in agriculture and thereby increase commercial productivity, although this is not necessarily what ensues (cf. Haugerud 1989; Platteau 2000). Second, land enclosure may occur as a result of the fencing off and *de facto* 'privatisation' of land *in situ* by wealthy herders (Graham 1988; Behnke 1988; Hitchcock 1990; Prior 1994). Importantly, as capitalist relations of production and the demands of a global 'free' market increasingly penetrate African farming sectors, a land-privatising trajectory becomes ever more likely, even in contexts where land redistribution to poorer farmers on communal land is a stated objective (as, for example, in the post-apartheid contexts of Zimbabwe, South Africa and Namibia).

Box 5.5 Traditional concepts of landownership among Ju'/hoansi 'Bushmen'

Although conventionally thought to have little concept of land tenure or resource ownership, a consideration which has undermined their formal claims to land throughout southern and East Africa, 'hunter-gatherer' populations conceptualise land and natural resources in terms of socially defined access rights determined through kin relatedness and inheritance. Here we review categories of land among the Ju'/hoansi, speakers of a central !Kung language who inhabit the Nyae Nyae area of western Botswana and eastern Namibia (see Figure 5.2). Ju'/hoansi recognise two types of communal land; the broad category of *gxa/kxo* and the named places of *n!oresi*. These are discussed separately below.

1. Gxa/kxo

This term translates literally as 'face of the earth' and refers to all the land and its resources in Nyae Nyae, to which all Ju'/hoansi have use and habitation rights as individual members by descent. The *gxa/kxo* thus is not the property of any corporate body within the Ju'/hoansi. The rights of individuals within the *gxa/kho* include the following:

- the right to use major plant-food resources such as the *tsi* or *morama* bean (*Tylosema esculentum*) and *g/kaa* or *mangetti* nuts (*Schinziophyton rautanenii*, formerly *Ricinodendron rautanenii*);
- the right to hunt and track animal wildlife, such that a hunted animal belongs to the hunter who strikes it, and not to the owners of the recognised territory or *n!ore* (see below) in which it was hit or in which it dies from the effects of arrow poison;
- the freedom to travel;
- the right to live at a permanent source of water during drought periods.

2. N!oresi

The *n!oresi* are named territories without fixed boundaries, usually with important focal resources such as permanent or semi-permanent waterholes and concentrations of valued plant-food species. Individual rights to residence within a *n!ore*, and to use its resources, are inherited directly from both parents and ownership of a *n!ore* is only recognised if this traceable descent can be demonstrated. As such, 'ownership' of a *n!ore* is exclusive to a group related through kin alliances who manage its resources communally. 'Ownership' cannot be conferred on outsiders, even though they may reside within a *n!ore* for a prolonged period of time with permission of its recognised owners. An individual chooses in adulthood which of their parents' *n!ore* they wish to claim as their own and, through marriage to someone from outside that *n!ore*, gain rights of access and resource use to a second *n!ore*. In this sense, kinship networks underpin in a fundamental way an individual's rights to land and resources.

Sources: Ritchie (1987); Botelle and Rohde (1995).

Privatisation of previously communal lands is thus occurring incrementally in many countries of the region. Even when this is through legal, official channels it is often highly controversial, because cash-strapped African governments are ceding huge tracts of land to wealthy individuals or corporations, sometimes expatriate, without much care being taken to ensure that the land is unoccupied or unused. There is great potential for such land transfers to involve corruption in high places. Any people who thereby are displaced are rarely consulted, let alone compensated properly, which is manifestly unjust. In Tanzania, for example, acquisition of private title to formerly communal lands has proceeded far from the location of the land itself in a way that is neither transparent nor equitable: little or no warning has been given to inhabitants that they can be made, and indeed are becoming, landless and effectively squatters on 'their own' land (Igoe and Brockington 1999). Privatisation of communal land *can* enhance security and political representation for some, as illustrated in Box 5.4 by the case of landed Maasai in Kenya. The other side of the coin is that those already vulnerable tend to be impoverished by this process. In many cases this has a gender component in that land title is usually vested in male family heads (e.g. Talle 1988; Hodgson 1999, 2000). Ethnic and class dimensions to land acquisition processes also complicate matters, sometimes conferring a tacitly violent edge to dealings regarding land. For example, the acquisition of legal title to land in Maasai areas by Kikuyu and Kipsigis people has frequently been accompanied by violence (Galaty 1999a; Thompson and Homewood 2002; Homewood *et al.* 2003).

Further, a number of studies indicate that when privatisation of land occurs in this region, the actual use and management of land and resources may still allow flexible and reciprocal access to geographically dispersed land areas with, for example, the movement of livestock between ranches which are long distances apart. In other words, a compromise between new systems of private tenure and ecologically suitable CPR management practices tends to emerge in ways which may be unanticipated by policy-makers. Movement remains essential during drought periods (Niamir-Fuller 1999) and continues in Kenya, even where pastoralists are settled on delineated group ranches (e.g. Grandin and Lembuya 1987). Even settler livestock farmers in Namibia and South Africa, who have exclusive use of huge ranches under freehold tenure, are documented as needing to move their herds across ranch boundaries, and sometimes over large distances, in order to maintain herd numbers in the face of variable forage productivity (Sullivan 1996a). In South Africa, from about 1910 to the 1930s, the government even subsidised transhumance by rail in response to pressure from white livestock farmers (Beinart 2003, forthcoming).⁶ The evidence

⁶ There was, however, considerable pressure from government agricultural officials for such practices to end. The favoured policy was for farmers to adopt rotational grazing on their farms, to avoid transhumance which, *inter alia*, was thought to spread livestock diseases. Some farmers managed in the short term to reduce the need for transhumance by, for example, investing in fodder. One plant used was the spineless cactus but when this was destroyed by cochineal in 1946, recourse had again to be made to transhumance (see Beinart 2003, forthcoming).

thus suggests that where access to extensively distributed resources is important, as is the case for dryland environments in southern and East Africa, it might be inappropriate to assume that individualised land tenure holdings are essential for increased economic productivity (Behnke and Scoones 1993; Homewood 1995; Sullivan 1996b; Niamir-Fuller 1999; Platteau 2000; Sullivan and Rohde 2002). At the same time, herders who are unable to qualify for, or otherwise maintain access to, privatised pastures and the other natural resources occurring on these lands, tend to experience disproportionately adverse effects due to privatisation and the application of monetarist macro-economic policy. The increase in wealth differentials between rich and poor is a common outcome of such agrarian reforms, in some cases inviting protest over land policy and other changes (Graham 1988: 7; Rohde *et al.* 2001).

There has been much misunderstanding over the implications of common property tenure regimes for natural resource management. Its detractors often confuse the system with open access tenure (see below) and erroneously assume that environmental degradation is an inevitable by-product. Its merits, however, can also be over-romanticised, for example by overestimating the egalitarian and environmentally sound characteristics of the system. They work best where small, long-established user groups cooperate closely and are tied into reciprocal arrangements so that trust is optimised.

CPR systems take time to evolve and are not easily established *de novo*, although current development interventions are often predicated on this. Their prevalence and effectiveness have recently been elevated in development and resource management discourse. Many current 'integrated conservation and development projects' (ICDPs) and 'community-based' development and conservation initiatives (discussed in detail in a later section) are based on strengthening and/or creating new common property management institutions and practices. Ironically, in some cases today, environment and development conceptualisations that favour CPRs are driving donor-funded policies at the same time as customary tenure practices are being dismantled wholesale by the state. This, for example, is the case in Tanzania where the 1994 Land Act attempts to extinguish customary tenure based on common property.

Open access

Land labelled 'open access' is that for which neither access nor use comes under any form of management or governing body. Examples include 'frontier' or 'no man's land' zones, where access is continually contested and control has ultimately depended on *force majeure* (Lewis 1961; Kurimoto and Simonse 1998; Fukui and Markakis 1994), and areas where the costs of developing and maintaining a system of territorial control outweigh the limited benefits of low or sporadic production. During the twentieth century, such areas frequently expanded due to the tumultuous effects of colonialism, apartheid and contemporary conflict.

In a number of African states that aspired to some form of socialism in the initial post-colonial era (e.g. Tanzania and Mozambique), all land

reverted to the state at independence or, as in Namibia, formerly communal land was thus transferred. This resulted, to some extent, in a *de facto* open access situation replacing a formerly CPR system (Moris 1981; Bromley and Cernea 1989; Homewood 1995). In these contexts, local rural communities often nevertheless maintain their CPR management systems, even if the allocative powers now rest with new, and perhaps political party based, local institutions. However, given the limited resources and power of many emerging African states to regulate or enforce access to land and natural resources, these situations can be ripe for well-placed individuals to take advantage of the tenure vacuum and profit at the expense of a wider group of customary users (Galaty 1999a; also see Box 5.4). In Namibia, for example, the post-independence constitution allows all citizens to move to wherever they choose on communal (i.e. state) land, with the *proviso* that the customary rights of others be observed. Problems have arisen because no procedures or resources exist to monitor this process, with the result that some groups have been marginalised in the face of incoming, and frequently wealthy, herders (Botelle and Rohde 1995; Sullivan, 2002c).

Early analyses of African land-use tended to represent what were complex common property regimes as situations of 'open access' – with resources used on an ad hoc and 'free-for-all' basis until 'degradation' occurred and people were forced to move or turn to alternative resources. The most famous exposition of this scenario is Hardin's (1968) 'Tragedy of the Commons'. In relation to African pastoralism, this model alleges that environmental degradation is inevitable since pastoralists 'free-ride' – benefiting from the profits of individual herd accumulation while bearing none of the costs of communal range use and possible degradation. Although still often invoked, this is deeply misleading (Platteau 2000). As explained in the preceding section, CPRs are *communally* managed. Individual profit-maximising behaviour, the conceptual basis of much economic theorising under capitalist modes of production, is thus constrained.

State land

Apart from land used communally but under state ownership, much of the rest of state-owned land in southern and East Africa is set aside for the 'conservation estate', as national parks, forest and game reserves, etc. In these areas access and resource use by local people are either prohibited, or there are strict limits on the nature of access and use. These restrictions are often deeply resented by local communities, especially if they were summarily evicted to make way for the conservation areas, as has all too frequently occurred in the region. Restricted access to state land may also occur in order to protect significant economic resources, as, for example, with the so-called diamond areas of Namibia.

The above categories of resource tenure by no means constitute a strict or static typology. Any one geographical area may encompass multiple

and changing types of tenure, making up a diverse mosaic of different, site-specific ways of managing natural resources. On top of this, the spatial and social distribution of land may change through time, together with the resources (labour, legal and enforcement) available to maintain territorial control.

In summary, most African states face conflicts between customary tenure regimes and imposed national (formal) legislation defining both state and privately owned land (individual or corporate), at both the level of national legal frameworks and at individual sites (Shivji 1998; Toulmin and Quan 2000). This is made worse where successive administrations have brought in conflicting systems, and where alternative sociopolitical hierarchies exist through which disputes are contested (e.g. 'traditional' leaders versus formal district and regional government). Land tenure and natural resource access in many parts of Africa thus comprise what Mortimore (1998) has called a palimpsest of systems, evolved by accretion and displacement with each new wave of migration or conquest or change of policy. Each new event has left a new layer in the hierarchy of tenure relations.

Indigenous knowledge, resources and trade-related intellectual property rights (TRIPs)

In the last two decades of the twentieth century there was much wider recognition of the depth and importance of the knowledge held by many rural Africans of their local environment (e.g. Brokensha and Riley 1986; Riley and Brokensha 1988; Juma 1989). However, it is also noted that such knowledge has frequently been eroded through the alienation of people from their land; through the institution of internationally led economic policies which contribute to the replacement of indigenous agricultural practice; through greater access to alternatives; and through the devastating effects of conflict. Nevertheless local environmental knowledge remains a highly significant resource, and its resilience and dynamism are often greater than anticipated (Sullivan 1999b, 2000; Redhead 1985; Maundu *et al.* 2001). Working with local people to develop resource management not only fits with the contemporary emphasis on participation in development but also, by tapping into this knowledge, may avoid much wasted or misdirected effort.

This issue also relates to the accelerating global search for potentially commercial 'natural products' – particularly of pharmaceuticals, botanical medicines and cropseeds (e.g. Moss 1988). This has engendered increasing concern regarding the protection of Africa's biological and/or genetic resources, of the local knowledge surrounding their use, and of the economic status of the source community (Ten Kate and Laird 1999). A particular danger is that local knowledge and practice regarding biodiversity are exploited in the development of indigenous genetic resources (including synthesis and patenting of isolated components), without recompense to people whose pre-existing biological knowledge is rendered

invisible by being communally held and part of an oral, unpublished tradition. In response to these concerns, countries in southern Africa are reviewing and creating new legislation to guide 'biotrade'. Such legislation is also in line with the international framework of the 1992 Convention on Biological Diversity. This convention's signatories assert a commitment to protect biological diversity and to institute benefit-sharing (e.g. payments, training, royalties, technology transfer). Namibia's proposed biotrade legislation, for example, tries to ensure that 'bioprospecting' and the commercial exploitation of indigenous species are accompanied by protection of local-user and intellectual property rights, as well as the contractual return of economic benefits (see Craven and Sullivan 2002).

Conservation of natural resources: from criminals to community

Fortress conservation: the separation of people from 'nature'

Since the turn of the century, conservation in Africa has been dominated by ideals transported and imposed from a recently industrialised Europe, which saw the continent's wildlife-rich savannas as a seemingly recovered Eden, and emphasised the preservation of 'wilderness' landscapes containing animals and not people (e.g. Abel and Blaikie 1986; Anderson and Grove 1987). Following the model of Yellowstone National Park established in North America in the 1800s, this approach led to the delineation of protected areas from which local people were excluded.⁷ Ironically, national parks were usually conceived of, and run by, 'penitent butchers': European hunters who had decimated the continent's wildlife through hunting for trophies to provide an overseas market with items procured from large animals (e.g. elephant ivory, rhino horn and ostrich feathers) (MacKenzie 1987; Carruthers 1995). Parks were set aside for the pursuit of a wilderness aesthetic by European elites from the aristocracy, the colonial administration and growing numbers of natural historians. African uses of natural resources and the links between wildlife and human welfare were invariably severely compromised.

The perceived incompatibility between wilderness and human occupation necessitated the construction of various 'supporting narratives', or justifications, for the conservation policies that were detrimental to indigenous people (Galaty 1999b). Thus local consumptive use of wildlife was portrayed as ignoble and non-sporting, and as unethically and unsustainably destructive, justifying the further prohibition of activities such as through-passage, resource-gathering and livestock grazing in protected areas. At the same time, even utilising wildlife *outside* protected areas was frequently prohibited through legislation (e.g. game laws), as was the use of vegetation resources which were protected in forest

⁷ It is pertinent to note that it was the genocide of indigenous populations that accompanied European settlement of North America (e.g. Brown 1970) which allowed Yellowstone to be established on the principle of excluding people.

reserves and under Forestry Acts (e.g. Juma 1989). In other words, much that was formerly part of 'normal' subsistence in rural Africa was reconstructed as illegal and criminal (Marks 1984; Bell 1987). People were (and still are) seen as potential if not actual poachers, and the parks/people relationship was (and is) based to a large extent on policing and law enforcement. The whole process of resource conservation and protection, therefore, acted to impoverish African populations who were already suffering the combined effects of the slave trade, imported disease, land alienation, taxation and requirements by the colonial state for labour to support new industry and settler agriculture, or to produce cash crops.

Typically eviction and exclusion have taken place with little or no compensation (Brockington 2001). In some cases, compensation was negotiated for the loss of livestock, personal injury and the trampling of crops by wildlife, and some 'problem animals' were shot following attacks on livestock (Ansell 1989; Galaty 1999b). Africans have not been passive recipients of such exclusionary environmental policies, however. In many instances they have actively resisted and protested against restrictions in circumstances where the balance of power has been stacked against them (e.g. Gordon and Sholto Douglas 2000). The exclusion of people from resources and decision-making in protected areas, however, has meant the removal of very significant areas from African use and habitation in some countries (see Table 5.3). Over 40 per cent of Tanzania, for example, comprises some form of conservation estate, and 27 per cent of its total

Table 5.3 Protected areas in selected countries of southern and eastern Africa (% land area)

Country	Protected areas (national parks and game reserves) (%)	Other
Angola	6	+ large controlled hunting area
Botswana	17	18% (controlled hunting areas – licences issued for subsistence and recreational hunting)
Malawi	11	10% (forest reserves and protected hill slopes)
Mozambique	13	+ hunting reserves and fauna utilisation zones
Namibia	12	+ 8% private game farms
Tanzania	27 (incl. forest reserves)	+ other game reserves
Zambia	32 = national parks and game management areas	9.8% = protected forest
Zimbabwe	12.5	2.3% = state forests; also CAMPFIRE project areas on communal land and wildlife conservancies on private land

Note: The IUCN recommends that some 10% of a country's land surface area is set aside for conservation purposes (Musters *et al.* (2000)).

Source: After CDC (1984: 15, 18); du Plessis (1992: 132); Moyo *et al.* (1993); Wildlife Sector Review Task Force (1995); Nhira *et al.* (1998).

land surface area allows no habitation or use by local people (Wildlife Sector Review Task Force 1995). In some parts of the region, the policing and enforcement of fortress conservation in national parks and game reserves have often meant drastic measures (including 'shoot-to-kill' policies in Zimbabwe, Zambia and the DRC). These tend to be portrayed as being directed against armed and organised international poaching gangs, for whom there is, perhaps understandably, little sympathy. In reality, however, these measures may also be used against historically marginalised people (Peluso 1993). A very different set of conservation issues is faced in other countries, where conflict situations and an effective breakdown in civil society mean that protected areas are poorly staffed and little policed. Moyo *et al.* (1993: 23) observe for early 1990s Angola, for example, that most conservation areas have been 'completely abandoned by the government, with absolutely no control being exercised over the hunting of animals, the burning of forests, and human settlements in prohibited areas'. The destabilisation era of the late 1970s and early 1980s, when white minority regimes struggled to maintain their supremacy in southern Africa, also saw dramatic destruction of wildlife, encouraged or orchestrated by the South African Defence Force (SADF) in order to help finance this process (and line private pockets; see Ellis 1994).

These colonial paradigms of separation between wildlife and people, and of the erosion of indigenous rights to natural resources, together with their associated narratives, have come under attack from various quarters in recent years. These include:

- development and human rights groups who assert the need for improvement of local livelihoods, and often affirm indigenous peoples as 'natural' conservationists;
- conservation groups alarmed by the costs of enforcement and the implications of structural adjustment which, through 'rolling back the state', reduces state resources for policing and funding conservation areas. This has prompted recognition of the pragmatic need to enlist the support of people living in communal areas, particularly those adjacent to conservation areas, to ensure the long-term sustainability of conservation, particularly given the new climate of 'participatory development' guiding funding from donors (e.g. Lindsay 1987; Western 1982, 1984; Lewis *et al.* 1991; Wily and Mbaya 2001);
- resource economists who argue that the 'sustainable use' of resources, including slow reproducers such as elephant and rhino, is necessary for the conservation of their habitats, *provided that significant benefits accrue to local people* (e.g. Barbier *et al.* 1990);⁸

8. The late ecologist Graham Caughley (1993) maintained that, for slow-reproducing species such as elephants, money may accumulate interest in the bank more rapidly than resource stocks can reproduce, thereby making the conversion of the resource into cash (e.g. through hunting for ivory or through felling hardwoods) the most economically rational act. He used this to explain the economic incentives operating against sustainable use of such species. However, due to low and even negative interest rates in many southern and East African countries, it may indeed make economic sense to retain animals, whether cattle or wildlife, as cash 'on the hoof'.

- local populations who may primarily experience wildlife on 'their' land as crop pests, a source of danger to life and limb, and as resources which could be utilised as food and a means of income. Given historical circumstances, 'illegal' uses of, or attacks on, wildlife can also be viewed as a form of local resistance against a system of restrictions viewed correctly as illegitimate and discriminatory.

'Community-based conservation': a radically new approach?

Current political and economic realities, and awareness of the rights, needs and aspirations of rural African populations, make it clear that exclusion from natural resources may not be the optimal policy for their conservation, however attractive this option may remain for environmentalists and conservation biologists (e.g. Ansell 1989; Kramer *et al.* 1997; Struhsaker 1998; Robinson and Bennett 2000). The outcome has been the construction of a new conservation paradigm influenced by the World Conservation Strategy (IUCN/UNEP/WWF 1980) that is reflected in the national conservation strategies of many African countries (e.g. CDC 1984; Duffy 2000). This paradigm is based on ideals of 'participation', 'benefit-sharing' and, ultimately, of 'community-based natural resources management' (CBNRM) for both conservation and local income generation. In other words, it has been increasingly acknowledged that a 'win-win solution' for both conservation and rural development will require the support of local communities (e.g. Leader-Williams and Albon 1988; Kiss 1990; Davis *et al.* 1994; IIED 1994; Western and Wright 1994; Brockington and Homewood 1998; Wily and Mbaya 2001).

'Community-based conservation' however, has emerged from a palette of by no means mutually compatible ideas and ideologies. Conservationists argue that, if communities are to benefit, they will need to share the conservation vision. Rousseauists⁹ aver that if local indigenous people are in control they will, by definition, manage resources sustainably. Development workers and human rights activists believe that local residents should have control *whether or not* they eventually choose to pursue a conservation outcome. 'Community conservation' (CC) can thus be a catch-all term to cover many different possible arrangements (e.g. Western and Wright 1994), and some authors only use the term to refer to initiatives in which resource ownership and decision-making devolve to local people (e.g. Hartley and Hunter 1997). Table 5.4 considers some of the variations in conceptual approach which have come under the broad label of 'community-based conservation'. Reading from top to bottom, these approaches can be seen to represent a sliding scale of participation in four different factors:

1. The direction of information flow (e.g. one-way and top-down; two-way; bottom-up);

⁹ Jean-Jacques Rousseau was an eighteenth-century French writer and philosopher who argued that 'man' in his 'natural state' was a creature of noble instincts who lived in harmony with his environment, expressed in the recent populist view of the 'ecologically noble savage'.

Table 5.4 Some typologies of types of participation in 'community conservation'

<i>Typology by publication: Kiss (1990)</i>	<i>Wells et al. (1992)</i>	<i>Pimbert and Pretty (1996)</i>	<i>Kiwasila and Brockington editorial (1996)</i>
<ul style="list-style-type: none"> • Participation in benefits • Participation in planning and design • Participation in implementation and management 	<ul style="list-style-type: none"> • Information-gathering • Consultation • Decision-making • Initiating action • Evaluation 	<ul style="list-style-type: none"> • Passive participation • Participation by consultation • Participation for material incentives • Functional participation • Interactive participation • Self-mobilisation/active participation 	<ul style="list-style-type: none"> • Passive • Interactive (benefit sharing) • Dynamic (agendas determined by local communities)

Sources: Compiled from information in Kiss (1990); Wells *et al.* (1992); Pimbert and Pretty (1996); Kiwasila and Brockington (1996).

2. The degree of involvement in setting the agenda (e.g. goals imposed; co-operation achieved through coercion; goals negotiated and co-operation won; goals set by 'community'; local people initiate and are prime-movers);
3. The nature of benefits accruing to local people (e.g. opportunistic handouts; regular proportional revenue-sharing; 'community' ownership of resources with the right to issue leases or offtake licences and set quotas for offtake);
4. The degree of contribution to decision-making (e.g. from nil to total control).

In practice a country may combine many of these approaches in an overlapping mosaic of varying access to different resources, and of multiple interactions with local people to gain support for the conservation endeavour.

Indirect subsidies versus direct payments?

Community-based conservation has been celebrated as a radical departure from the exclusive, centralised and alienating 'fortress' conservation practices of the past (Hulme and Murphree 1999; Jones 1999). Recent critique, however, suggests that the label 'CC' often obscures circumstances and practices which are not qualitatively different from earlier approaches (e.g. Alexander and McGregor 2000; Murombedzi 1999; Gillingham and Lee 1999; Roe *et al.* 2000). Identified problems are detailed in Box 5.6.

In theory, CC initiatives attempt to bring benefits from conservation to local people, and thus make conservation more successful and sustainable. However, an overriding desire to obtain a conservation outcome means that policies may be introduced which are not, on critical inspection, really viable. The following constraints or problems may feature in such policies:

- Setting a conservation goal which is not rooted in local priorities and may conflict with them;
- Establishing a CPR system where none currently exists;
- Compensating for *major* livelihood losses and/or opportunity costs with *minor* benefits;
- Subsidising commercial ventures which may not be more lucrative than existing or alternative activities and which may not be commercially viable in the absence of subsidies;
- Working within, rather than reforming, existing inequalities in land and resource distribution.

CC can be meaningful to the rural poor but only when it genuinely improves their livelihoods. If the costs are greater than the benefits then evidently no outreach or education programme can help them 'own' the enterprise. Clearly, it is preferable that local people benefit from the animal wildlife with which they live instead of remaining alienated from these resources. But beneath the rhetoric, the reality of CC is that, often, it may not be the radically and qualitatively different approach to conservation that is frequently claimed. Escobar (1996) has argued that 'community-based

Box 5.6 Community-based conservation: a critique

Material benefits for community

- Reviews of CC suggest that initiatives tend to deliver *negligible* amounts at the household level, despite some specific exceptions.
- Many problems identified of local corruption in use of money generated.
- Costs of running CC often heavily subsidised by conservationist donors – sustainability of benefits to local people is thus questionable.

Continuity with past conservation/preservationist policies

- Run by same people/organisations with little retraining.
- Primarily promotes continued access of private safari/hunting operators to animal wildlife for profit.
- Promotion of armed community game guards increases policing aspect of conservation, and access to small arms in often politically unstable areas.
- Focus on large (and dangerous) mammals and macho identity of related conservationists tends to confine local participation in decisions to men.

Community identity

- As with other community-based development initiatives, problem of heterogeneity within communities and thus conflict over 'desired' resource management.
- Long-term community liaison required to mediate for fair and sustainable participation usually not funded.

Sources: Marindo-Ranganai and Zaba (1994), Bergin (1995), Emerton (1996, 1998), Norton-Griffiths (1996), Simpson and Sedjo (1996), Patel (1998), Gillingham and Lee (1999), Matenga (1999), Taylor (1999), Sullivan (1999b, 2000), Wøien and Lama (1999).

conservation' is inseparable from a Northern modernising development discourse which asserts conformity and control through donor-funding to the countries of 'the South'. In the case of conservation in Africa, this means that support is available only to 'communities' to the extent that they agree to construct themselves as 'suitable' custodians of internationally valued biodiversity, particularly animal wildlife (see Box 5.7). While now stressing that local people should benefit from wildlife, a number of

Box 5.7 CAMPFIRE in Zimbabwe: tensions between the philosophy and practice of CBNRM

The Communal Area Management Programme for Indigenous Resources – or CAMPFIRE – in Zimbabwe involves 36 of Zimbabwe's 57 districts and 85 local communities representing 200,000 households. The scale of the programme is thus huge, reflecting both the dynamism of those involved in wildlife conservation – particularly in seeking new means of bringing previously excluded local people 'on board' – as well as the high degree of donor funding available for 'community-based conservation' initiatives in southern African countries in the last couple of decades.

CBNRM initiatives like CAMPFIRE are, in theory, meant to combine wildlife conservation with rural development aims, such that local inhabitants benefit materially from wildlife on their land *and* are empowered regarding decision-making processes. However, a range of critical studies has emerged in recent years which identify flaws in the assumptions guiding this programme, as well as significant problems in implementation 'on the ground'. In Nkayi and Lupane districts of Matabeleland North in Zimbabwe, for example, a CAMPFIRE initiative in the 1990s met with outright resistance from most of the local people, yet the state went to great lengths to try and impose the project, disregarding their reasons.

In the Gwampa valley in southern Nkayi and Lupane (see Figure 5.2), the population was made up of a small number of early settlers, mainly of Nyai origin, and a much greater number of people who had been evicted from 'white' farms. While the former had some tradition of hunting, the relationship between wildlife and the evictees was deeply antagonistic, for the remote and very difficult physical environment in the valley was alien to them, and they had struggled long and hard to establish farming livelihoods and 'tame' or 'civilise' their surroundings. To complicate matters further, people who lived on the Gwampa river's southern banks and watershed were on Forestry Commission land and their tenure was insecure. Between 1970 and 1972 many were evicted without compensation. Others living in the communal areas on the other side of the valley were also subject to removals in line with colonial state conservation policy, which was a matter of huge controversy. Many people had had to move several times during the colonial period. During the liberation war in the late 1970s some people moved back to the forests with the support of the liberation army, only to find themselves being evicted again in the late 1980s as the Forestry Commission reasserted its exclusion policies. This was referred to as 'the forest war' as it was often accompanied by state violence.

In these circumstances it is evident that any CBNRM initiative which further affected people's rights to access resources and land would have to be introduced with great sensitivity and would have to benefit them in ways which they deemed to be significant. Unfortunately the attempt to implement the CAMPFIRE proposal did not meet these criteria. The project had funding pledged from the Canadian International Development Agency (CIDA) and the central government as well as personnel and vehicles from a Danish NGO, MS-Zimbabwe. There was little big game in the Gwampa valley and the plan was to stock it with wildlife that would attract photo safaris which would bring revenues to the local area. However, this would involve moving people out of a strip of land running the length of the valley, measuring 1.5–2 km

from the river itself, which would then be fenced off allowing wildlife to move between the Forestry Commission's lands and the river. For some of these people their eventual destination was not even specified. The donors were promising large sums of money and the local councils were keen on the project as they believed it would raise their revenue. Yet the local communities were not fully consulted, which is meant to be a cornerstone of CBNRM principles.

In these circumstances it is scarcely surprising, perhaps, that most of the local people in Gwampa valley steadfastly refused to agree to the project. They were subsequently treated with astonishing contempt. For example, the provincial governor asserted they 'were backward and had nothing to lose because they lived only in "grass huts"'. Again, in complete contrast to the idea that CAMPFIRE should be empowering, 'executive officers and district administrators argued that development was necessarily coercive'. Committees that resisted CAMPFIRE were dissolved and new ones handpicked; minutes of meetings were falsified; CAMPFIRE opponents were arrested by the police. Experience with local councils over timber exploitation had also made people cynical about the likelihood of CAMPFIRE revenues being used for their real benefit and, in any case, a World Wildlife Fund report of 1994 felt the project was probably not very viable. The proposal also ignored the local history of rounds of evictions and people's antipathy towards wildlife. Their main resource grievance was about land. Since the proposal would reduce land availability even further it 'was met with horror'. Talking about the liberation war residents argued, 'We didn't fight to stay in this sandy area, we fought for rich land. We are 16 years independent, but nothing has been done – people are still piled up like these melons here' and, 'We're going to be grouped together like buffaloes while land is given to animals. This makes us think of war, this is terrible. . . . There's so much empty land – Forestry, commercial farms – and they come here to where people are living.'

This example illustrates a worrying gap between the philosophy of CBNRM and the practice of some conservation projects which try to assume a spurious legitimacy (and donor funding) by labelling themselves as 'community-based'. There are also many other complex issues that identify CAMPFIRE as an intensely politicised and contested area of activities. These include conflicts regarding ethnicity and gender in constraining access to CAMPFIRE benefits, and accusations that CAMPFIRE simply maintains the privileged access to wildlife enjoyed by foreign business interests and tourists. For example, Tembo-Mvura hunter-gatherers in the Zambezi valley have argued, 'What CAMPFIRE does is to stop us from hunting so that white people can come from far away to kill animals for fun. We have heard that these people pay money but we have never seen any of it.' A noticeable trend for fencing to facilitate safari hunting has led to local perceptions elsewhere in Zimbabwe 'that the safari operator wanted to create a private farm out of their land, . . . to prevent people from accessing . . . resources . . . [and] to reintroduce white colonialism'. Furthermore, it is clear that distant interests in African wildlife play an important role. Thus the views and desires of foreign tourists and trophy hunters, and of development and conservation 'experts' working within a neo-liberal framework which assumes wildlife to be an economic 'resource' characterised by its use as opposed to intrinsic value, are all being played out on the Zimbabwean stage.

Sources: Alexander and McGregor (2000), Dzingirai (1995), Hasler (1999), Marindo-Ranganai and Zaba (1994), Wels (1999).

perhaps unrealistic, and generally unvoiced, expectations remain (Sullivan 2002b). First, there is the expectation that some African communal area residents should continue to live with dangerous wildlife on 'their' land. Second, that efforts should be made to foster the increase of populations of these same dangerous, but threatened, species. Third, that this should occur over and above investment in alternative sources of livelihood. Fourth, that, as donor-funding is phased out, revenue received from conservation efforts should be used to finance new communal area wildlife management institutions. Fifth, that a primary responsibility of these institutions should be the negotiation of business agreements which allow private safari operators continued access to the wildlife resources on which their profits depend.

A view is currently emerging, therefore, that suggests that, in practice, 'community-based conservation' is the fine-tuning of an existing status quo of inequality in the global and national distribution of capital, rather

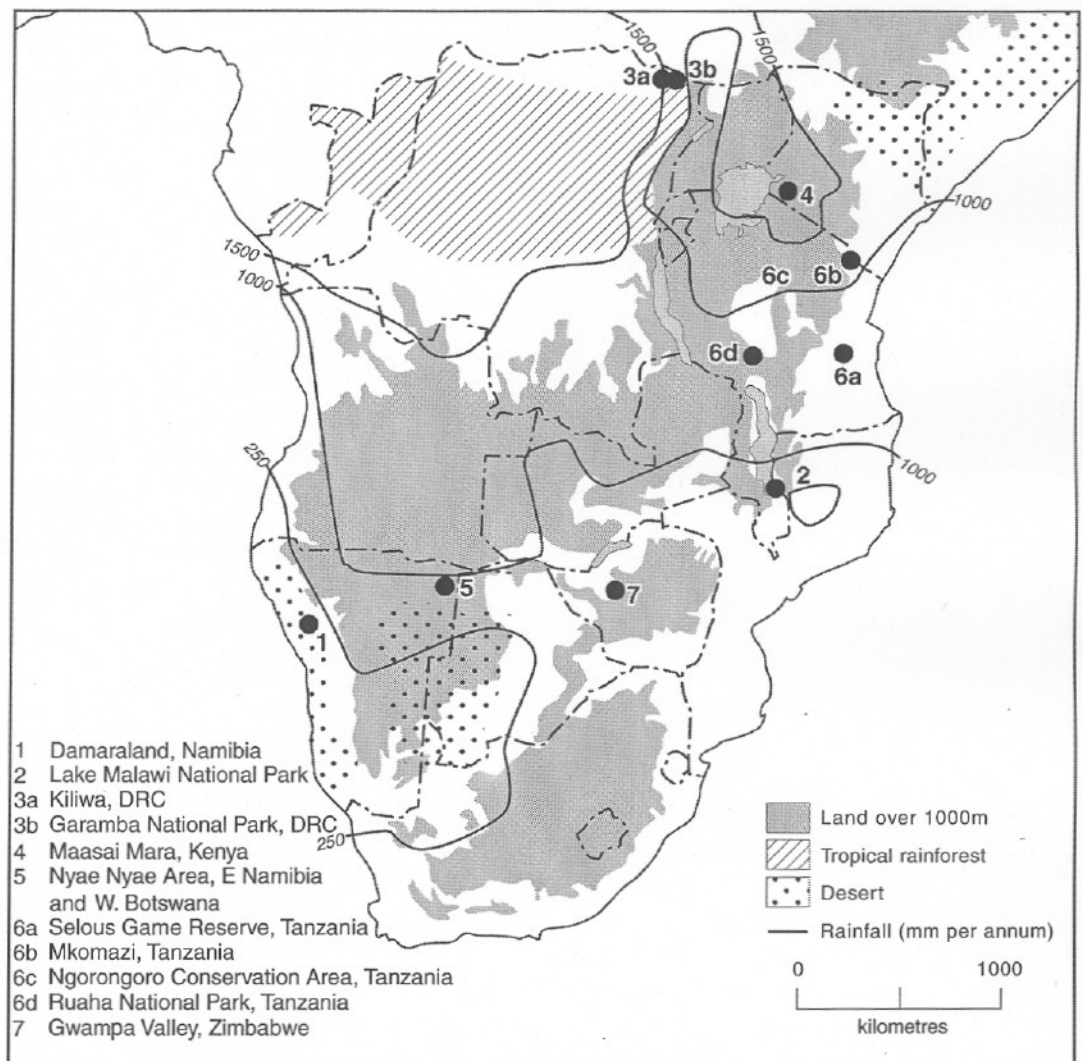


Figure 5.2 Location of places discussed in boxes in Chapter 5

than a radical way of devolving power and improving livelihoods. This view asks if it is reasonable to expect a structurally entrenched rural poor to continue to service the fantasies of African wilderness projected by predominantly expatriate environmentalists, conservationists, tourists and trophy hunters? Or that a communalising discourse equating rural development and 'empowerment' with wildlife preservation and foreign tourism will be 'sustainable', given both the constraints it imposes on individual aspirations and the dissatisfaction it may produce in people who feel excluded? An alternative suggestion is that wildlife conservation will be 'sustainable' only if accompanied by a 'consumer pays' approach, amounting to economically realistic and long-term subsidies directly to African land-users in recognition of the ways in which their land-use and livelihoods are being manipulated to meet national and international conservation objectives (see, for example, Simpson and Sedjo 1996; Kiss 1999; Sullivan 2002b). This implies nothing short of a secure commitment to substantial and long-term (upwards of several decades) international subsidies, directly to local land-users, of amounts realistic enough to compensate for the opportunity costs of not converting either land to alternative uses or large mammals to cash (e.g. Norton-Griffiths 1996). Failing this, it seems logical that policing and law enforcement, whether by government officials, NGO employees or community game guards, will remain the foundation on which preservation of internationally valued African wildlife and 'wilderness' depends.

Some thoughts for the future ...

It probably goes without saying that the countries and people of East and southern Africa face severe challenges which will affect both the availability of natural resources and people's uses and perceptions of them. Factors such as the tension between population increase and HIV-AIDS and the demographic implications of these (Chapter 2); the international economic policy arena and its effects on local land-use decisions (Chapters 3, 6 and 10); and the volatile and unpredictable incidence of violence and conflict (Chapter 9), are all significant for natural resources and livelihoods based on them. This is not the place to review or make projections regarding the complex interplay of these factors and their effects on natural resources and their uses. What we would like to emphasise, however, are a few issues which we consider important in the arena of natural resources use, management and conservation.

- Within conservation policy and implementation a greater and more explicit recognition is needed of the effects of gross structural inequality which protects wildlife and wild areas for wealthy consumers while expecting African land-users to shoulder the costs. In agreement with Simpson and Sedjo (1996), we consider that direct payments to land-users in return for conservation practice, instead of subsidised and constrained enterprise developments, should be explored as an approach to conservation which is more honest about the distribution of costs and benefits.

- Initiatives based on natural resources, whether oriented primarily towards conservation or economic returns, should be accompanied by the collection of biological field data and a monitoring programme regarding the population and recruitment status of the resource in relation to its uses by people (see, for example, Konstant *et al.* 1995; Sullivan *et al.* 1995; Homewood forthcoming). It is noticeable that few such initiatives currently collect and/or make public such data, despite being rooted in ideas of 'sustainability' of both resource offtake and local livelihoods.
- In a globalising but diverse world it is crucial to give attention to divergences that may emerge between local contexts and the more general policy *vis-à-vis* environment that is developed at national and global levels. This relates particularly to issues of equity in what remains an extremely unequal global distribution of wealth, opportunity and resources; to a lack of sensitivity to this inequity in approaches to conservation; and to the related potential for conflict and local resistance to emerge in the arena of 'natural resources' conservation.

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