CAMBRIDGE

Cambridge University Press
0521607493 - Maasailand Ecology: Pastoralist Development and Wildlife Conservation in Ngorongoro, Tanzania
K. M. Homewood and W. A. Rodgers
Excerpt
More information

1

Management problems and applied ecology in Ngorongoro Conservation Area

The Authority is charged with the duty of conserving and developing the natural and human resources of the Ngorongoro Conservation Area
Ngorongoro Conservation Area Ordinance, Cap. 413.

This book discusses the ecology and management of Ngorongoro Conservation Area (NCA) in northern Tanzania. NCA is internationally renowned as a conservation area for its scenic beauty, its spectacular wildlife, and its important archaeological and paleontological remains. It is also outstanding for its pioneering joint land use policy, which is dominated by conservation aims but at the same time maintains a large population of Maasai pastoralists living from traditional cattle and small stock husbandry. NCA does, however, illustrate a number of problems, ranging from the biological to the political, that are common to other semi-arid rangelands. In particular, joint land use inevitably means conflict between different interest groups. Despite these problems NCA has worked for thirty years and is still seen as a pilot model for multiple land use management in the semi-arid rangelands of East African Maasailand, and to some extent for the savannas of sub-Saharan Africa.

The central management issue in NCA is the conflict between conservation and pastoralist interests that has surfaced in many ways throughout Maasailand and elsewhere in Africa. In biological terms the conflict centres on the relative demands and impacts of livestock, wildlife and people on the natural resources. Maasai and conservationists see livestock and wild ungulates as competing for grazing, with important consequences for population dynamics and productivity of wild and domestic herds. Conservationists fear overgrazing, trampling, and soil erosion as a result of livestock presence, and forest and woodland decline as a result of fire, timber and fuelwood use. Maasai fear the progressive erosion of traditional rights of access and resource use by an intruding Conservation Authority (NCAA). The spectacular variation, both spatial and temporal, of grazing, water, and mineral resources, and of disease risks, and the resulting mobility of both wild and domestic animals, have largely precluded simple solutions of internal zoning.

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521607493 - Maasailand Ecology: Pastoralist Development and Wildlife Conservation in Ngorongoro, Tanzania
K. M. Homewood and W. A. Rodgers
Excerpt
More information

As well as this central management conflict, other groups have a strong interest in the rich resources of NCA. Successive colonial and national governments have managed parts of NCA for cattle ranching, wildlife hunting, tourism and large-scale agriculture. Illegal hunting for ivory and rhino horn have reached the status of organised crime in NCA.

Conservationists have several times sought to exclude the Maasai from the area, as was done in forming the Serengeti, Amboseli, Tarangire, Maasai Mara, Nairobi and other National Parks (Sindiga 1984). The case for expelling the Maasai from NCA has always been presented on ecological grounds of environmental degradation and competitive threat to wildlife species. Despite decades of studies on the vegetation and wildlife species of the NCA/Serengeti area, however, little was known until recently of the ecology of the Maasai or their livestock. Little or no ecological evidence has ever been presented to back up the argument of ecological damage. This gap in knowledge prompted our study.

In 1979 the Conservation Authority declared that the pastoralists would eventually have to leave the NCA for the better protection of the wildlife resource (NCAA Board of Directors, 1980). NCAA requested UNESCO to commission a planning study, which was largely carried out by staff of the University of Dar es Salaam (ourselves included). The resulting management plan was submitted to NCAA in 1982 (Institute of Resource Assessment 1982). This was the fourth joint land use management plan in the history of NCA, and (like its predecessors) was not officially accepted. Despite the founding Ordinance stressing the need to consider both people and natural resources (see chapter heading), the NCAA has for most of its history seen the split between Maasai and conservation interests as too great to allow compromise. It is ironic that when NCAA approached UNESCO to fund a management plan intended to lead to Maasai resettlement, UNESCO was in the process of designating NCA a World Heritage Site in recognition of the harmonious interaction of Maasai and biosphere within NCA. Also, despite periodic moves to expel the Maasai, the land availability, political and human rights problems of attempting to resettle some 25 000 people and their herds were not considered. The current NCAA administration is better aware of Maasai needs and rights (Kayera 1985) but there is still a very ambivalent attitude towards them and their status in NCA (Malpas and Perkin 1986). The International Union for the Conservation of Nature (IUCN) has recently declared NCA to be a Heritage in Danger, has solicited greater government support for the area, and has recently helped coordinate background research for a fifth management plan.

The Government of Tanzania recognises the current land use debate in NCA as one of national and international importance. A seven-person Government

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521607493 - Maasailand Ecology: Pastoralist Development and Wildlife Conservation in Ngorongoro, Tanzania
K. M. Homewood and W. A. Rodgers
Excerpt
More information

Commission of Enquiry has now completed analysis of the IUCN research studies and of the question of long term pastoralist rights in NCA. The Commission report states that the Maasai are an integral part of the system, that they have not caused any significant reduction in conservation values, and that the Maasai have the right to stay. The report urges the NCAA to make major improvements in their inputs to pastoralist welfare and 'compatible' development. The report has now been submitted to the Minister for Lands, Natural Resources and Tourism: the political decision is still awaited. This is the stage at which all previous management plans have been turned down. Governments often see the pastoralist way of life as backward and incompatible with administrative goals such as tax collection, provision of health and education services, economic development and the promotion of national unity. In NCA conservation adds an extra dimension and many traditional wildlife conservationists still see problems in maintaining a pastoralist population. Officials associated with the Tanzanian Government and NCAA expressed this bluntly: 'They live like beasts and must be civilized', 'They harbour poachers', 'What will happen in the future when their numbers increase?' (direct personal communications to W.A. Rodgers in August 1989). Most social scientists and development agencies see no major conflict. We believe the worriers overreact to minor and isolated problems and overlook the past 30 years of largely successful compromise. Our purpose in writing this book is to argue a highly charged issue, involving one of the world's most important heritages, in terms of ecological fact and theory rather than strong feelings.

This book describes our study of the ecology of NCA Maasai pastoralism and sets it in the wider context of the ecology of NCA and of Maasailand in general. The book explores the conservation values of NCA and those ecological issues that have given rise to conservationist concern. It documents the nature and extent of pastoralist and other impacts on environment and wildlife. It looks at past management inputs affecting the Maasai and plots the course of pastoralist development in the NCA. The book seeks to establish which factors threaten the continued existence of conservation and of pastoralism in NCA, and conversely those factors that are either compatible with, or positively reinforce, the aims of both. The book leads up to a synthesis of the various facets of NCA ecology – range, wildlife, livestock and human – and an integrated view of land use prospects in NCA. We marshall evidence from historical, political, anthropological, development and archaeological as well as biological studies to explore the ecology of NCA and the future of joint pastoralist/conservation land use here and elsewhere.

The book is a mixture of applied biology and the management issues of

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521607493 - Maasailand Ecology: Pastoralist Development and Wildlife Conservation in Ngorongoro, Tanzania
K. M. Homewood and W. A. Rodgers
Excerpt
More information

policies, politics and economics. Biological knowledge will mean little if the major policy and management crisis the NCA faces is not resolved. We attempt to use basic biological facts to suggest preferred policies and management strategies.

Following this introduction, chapter 2 gives an outline of the physical environment, plant and animal communities, and the archaeological and palaeontological resources that contribute to the internationally recognised conservation and heritage value of NCA. Chapter 3 describes the Maasai population of NCA and their way of life. It begins with a discussion of the Maasai social system and the implications of this system for land use and livestock management. Chapter 3 also describes the successive pastoralist groups that have used the resources of NCA over the last few thousand years, and sketches the origins of the Maasai who now inhabit the area. Chapter 4 documents the history and politics of land use controversy in NCA. The sequence of colonial and national administrations that have manoeuvred to control the area since the turn of the century is discussed. Chapter 4 goes on to outline the present-day perceptions of different interest groups as to the value of NCA, the proper use to which its resources should be put and the relative importance of its various management problems. This material acts as the background for chapter 5, which summarises the main questions underlying current management debates in NCA. Chapter 5 then presents the rationale for our research and sets out the scope, methods, study sites and schedule of our field work.

Chapter 6 describes the unusual productivity of the NCA rangelands and reviews the state of knowledge on the dynamics of the grasslands, woodlands and forest of NCA. The management problems and debates specific to each vegetation type are discussed and underlying biological facts established. Particular emphasis is given to the problems of evaluating different types of rangeland and woodland degradation. Chapter 7 summarises the wealth of knowledge on the wild mammals of the NCA/Serengeti area. Their population and community interactions are reviewed, particularly the dramatic population eruption of the migratory wildebeest herds, and the mass antelope migrations that make NCA a crucial part of the Serengeti Ecological Unit and such a spectacular wildlife showcase. Specific wildlife management policies and problems are analysed.

Chapter 8 deals with livestock. It seeks to explain the special character of pastoralism (as opposed to other more intensive methods of husbandry) and to establish its importance in sub-Saharan Africa. The ecology of NCA livestock is set out in detail: their land use patterns, their population dynamics, their performance. Chapter 9 explores the conflict and complementarity between

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521607493 - Maasailand Ecology: Pastoralist Development and Wildlife Conservation in Ngorongoro, Tanzania
K. M. Homewood and W. A. Rodgers
Excerpt
More information

wildlife and livestock, assesses the impacts of wild and domestic herds on the environment and on one another's performance in NCA, and evaluates the productivity of Maasai cattle in NCA. Finally chapter 9 looks at the status of wildlife versus livestock populations in NCA and compares the situation there to that in other joint land use areas in East Africa.

Chapter 10 looks at the ecology of the Maasai in NCA. It describes past Maasai livestock development projects and their impacts on the ecology of Tanzanian and Kenyan Maasailand. A detailed discussion of the demography of the NCA Maasai clarifies past and probable future responses to ecological conditions and development interventions. Chapter 10 concludes with a study of the Maasai food system in NCA and summarises the trends and special problems of pastoralist subsistence in the Conservation Area.

Chapter 11 draws together the threads from all the previous chapters and weaves them into a final synthesis looking at three main issues. These are the balance of conflict and complementarity between conservation and pastoralist development; the past and future roles and forms of tourism in NCA; and the potential for different forms of wildlife utilisation. The chapter integrates this material to give an overview of land use prospects. Chapter 12 considers recommendations for conservation-compatible interventions in pastoralist development, and chapter 13 ends the book with our conclusions on the positive need for integrated Maasai land use in the ecology of NCA.

This book analyses the particular case of Maasai ecology in NCA. However, its implications go beyond NCA. The book takes the ecology of human land use as a central approach to understanding processes and linkages that are of management importance. In doing so it attempts to bridge the gap between anthropological and development-oriented studies that fail to deal with the biological aspects of conservation arguments, and the biological studies that commonly ignore political and sociological realities which motivate (or hamper) management action.

Several topical areas of concern in African ecology are discussed. The Sahelian droughts and famines of the 1970s and 1980s made clear the need for a better understanding of the ecology of pastoralism in arid and semi-arid rangelands of sub-Saharan Africa. In particular, the role of pastoralist impacts in environmental degradation has been the subject of lively debate. This book provides a case study of an area where pastoralist-induced degradation has often been assumed but not proven. It shows how general ecological principles superficially applied can be misleading, and how ecological theories may be misused to justify politically expedient rather than biologically sound management measures.

A second, and related, issue is the extent to which western livestock and

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521607493 - Maasailand Ecology: Pastoralist Development and Wildlife Conservation in Ngorongoro, Tanzania
K. M. Homewood and W. A. Rodgers
Excerpt
More information

range management and development are relevant in an area of unpredictable climate and fluctuating primary productivity. The concept of ecological carrying capacity if anything 'cramps our understanding' of such systems through its emphasis on their long-term means rather than on their variability (Shepherd and Caughley 1987). It is the variability of semi-arid systems, and largely but not solely the variance around annual rainfall means, that precludes the attainment of equilibrium densities, of sedentary populations and societies, and that forces flexible management of such systems. Western techniques of range management may not be sufficiently flexible to work in many arid and semi-arid rangelands without enormous capital investment. Western standards of productivity may be inappropriate if they fail to take account of variables of central importance to pastoralist subsistence. Indigenous breeds, techniques and strategies are increasingly acknowledged for their true worth (Niamir 1990). Introduced technologies have a poor record in sub-Saharan rangelands, both on performance and on their unexpected environmental impacts. This begs a series of questions as to the course that pastoralist development can and should take in this and other parts of Maasailand.

The emphasis on variability applies not only to natural factors such as rainfall, but also to political and economic forces. Over the period we have known Ngorongoro we have seen the tourism component turn full circle. During the first five years of the 1980s tourist numbers were at an all time low. Lodges and infrastructure were deteriorating, political and sociological wisdom decried foreign tourism, and NCA ran at a considerable monetary loss. Now in 1989 tourism is seen as the 'only way for Tanzania to generate foreign exchange and improve her economic status' (Minister for Lands, Natural Resources and Tourism, pers. commun. August 1989). NCA tourist numbers have grown rapidly, new lodges are planned, NCA tourist revenues are the highest ever. Tourism does not directly affect pastoralism. However, by changing economic perceptions of the value of NCA to the nation, tourism can change policies of land use which themselves radically affect pastoralist futures. Tourism has shown major fluctuations in other East African countries, and an upturn in tourist figures and revenue is not necessarily a lasting and problem-free trend. Just as with the biological factors, it is perhaps the variability, rather than the short-term mean, which should guide understanding of the dynamics of the system.

The book also covers a number of topical debates in the field of wildlife conservation. Orthodox conservation management in East Africa has excluded local populations from access to and resource use within conservation areas. In Maasailand such action was justified firstly on the grounds of pastoralist misuse of rangelands and consequent environmental degradation, and

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521607493 - Maasailand Ecology: Pastoralist Development and Wildlife Conservation in Ngorongoro, Tanzania
K. M. Homewood and W. A. Rodgers
Excerpt
More information

secondly on the basis of compensation derived from the revenue generated by foreign tourism. The environmental degradation issue is under question, as are the social and ecological impacts and economic justification of foreign tourism. At the same time, there is a growing controversy as to whether traditional forms of human land use should not be maintained in conservation areas. In NCA, the present landscape and wildlife populations have evolved through millennia of hunter-gatherer and pastoralist impacts. Human presence does not necessarily detract from the quality of naturalness or wildness, nor from the natural ecological processes that conservationists value. Traditional forms of land use may even contribute to the range of states that conservationists wish to maintain. Conservation organisations are also beginning to realise that conservation areas must enlist local support rather than antagonism if they are to survive in the long run. In particular, the wildlife of East African savanna parks depends to a great extent on the pastoralist rangelands that surround them. Joint land use systems such as the one pioneered by NCA have their problems, but may come to be seen as a vigorous and viable solution, and perhaps the only chance for long-term conservation of savanna areas.

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521607493 - Maasailand Ecology: Pastoralist Development and Wildlife Conservation in Ngorongoro, Tanzania
K. M. Homewood and W. A. Rodgers
Excerpt
More information

2

Ngorongoro Conservation Area

Ol tau l'enkop-ang The heart of our land

(Maasai expression: Waller 1979)

This chapter describes the environment of the NCA and its plant, animal and human resources. It begins with a basic catalogue of the main geomorphological land units. Climate is discussed in terms of the concepts of seasonality, year to year variability and drought. The special nature of the NCA soils, the main vegetation and habitat types, and their wildlife communities are described. The palaeontological and archaeological remains which contribute to NCA's special character and its importance to the world community are outlined. This review of NCA natural and human resources lays the foundation for more detailed examination, in later chapters, of the dynamics of the system, of interactions between species and of conflicts between differing management objectives. At the same time it illustrates both the uniqueness of NCA and the extent to which the area is representative of other African rangelands.

Natural resources

The natural resources of NCA are important to the management of conservation and development on two levels. Firstly, diversity of soils, topography and landform underlie the ecological diversity that supports the rich and abundant wildlife and pastoralist communities. Secondly, the same physical diversity creates a spectacular landscape which of itself exerts a powerful hold on international conservation interest.

(a) NCA land units

Ngorongoro Conservation Area is ecologically continuous with Serengeti National Park (SNP) (Fig. 2.1). These, together with adjacent rangelands, form the 25 000 km² Serengeti Ecological Unit, defined by the annual migratory movements of some three million ungulates. Ngorongoro Crater itself accounts for some 250 km² out of the total 8292 km² NCA.

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521607493 - Maasailand Ecology: Pastoralist Development and Wildlife Conservation in Ngorongoro, Tanzania
K. M. Homewood and W. A. Rodgers
Excerpt
More information

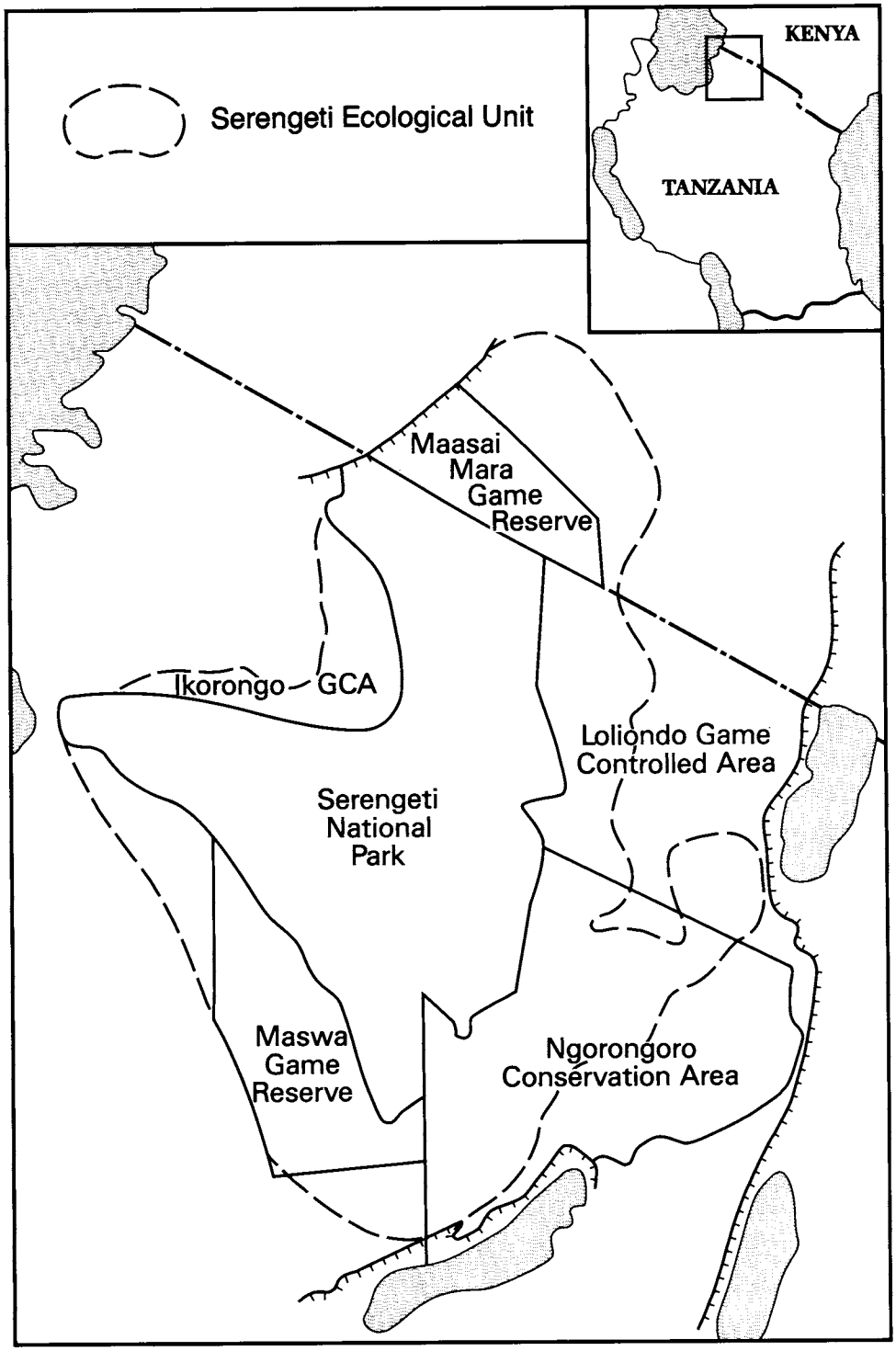

Fig. 2.1. Position of Ngorongoro Conservation Area and the Serengeti Ecological Unit (after Herlocker 1972).

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521607493 - Maasailand Ecology: Pastoralist Development and Wildlife Conservation in Ngorongoro, Tanzania
K. M. Homewood and W. A. Rodgers
Excerpt
More information

Habitats range from lowlying arid grassland plains, swamps and saline lakes, to volcanic peaks with Afro alpine and montane communities. The geology of NCA is described by Pickering (1960, 1968) and Hay (1976). Figure 2.2 shows the evolution of present-day features (redrawn from Fosbrooke 1972).

NCA can be conveniently divided into five broad geomorphological units (Table 2.1, Fig. 2.3, see back endpapers for place names).

1. The Crater Highlands comprise a gently rolling volcanic plateau between 2100 m and 2800 m which drops steeply on all sides. Rising from the plateau are a number of extinct volcanoes, of which the southernmost, Oldeani and Lemagrut, rise from Lake Eyasi at 1000 m to over 3000 m in height. Their upper slopes are forested and give rise to important springs. Ngorongoro Crater, to the north of these two mountains, is really not a crater but a caldera caused by the collapse of a once massive volcano. Its floor is some 18 km in diameter, forming a circular enclosed plain of 250 km^2 at 1700 m with a soda lake and several permanent springs and swamps. North of Ngorongoro Crater lies the smaller caldera of Olmoti (again with permanent springs and a small swamp). The country then rises gently to the northern volcanic peaks of Olosirwa (the highest peak at 3680 m), Loolmalasin and Nairobi. The last of these has its own small caldera of 30 km^2 in which lies Lake Empakaai. On the northeastern corner of the highlands lies a younger volcano, Kerimasi; Oldonyo Lengai (Maasai: the Mountain of God), a still active and strikingly steep-sided carbonatite volcano, is just outside the NCA boundary. The steep edges of the plateau are dissected by deep ravines, which suggest that heavier rainfall in the past has eroded deeply into the volcanic ash deposits.

2. The Angata Salei Plain forms a flat 10 km-wide corridor separating the Gol Mountains from the Crater Highlands. It runs northeast–southwest, broadening to the north, and acts as a wind tunnel carrying fine powder ash from the Oldoinyo Lengai ash cone. Soils are thus fine, unconsolidated and susceptible to erosion by wind and trampling. Mobile sand dunes or barchans can be seen at the western end of the plain near Olduvai Gorge.

3. The Oldoinyo Ogol Hills or Gol Mountains lie across the northwestern boundary of NCA. The hill ranges are of ancient Precambrian rocks and their steep eastern scarp faces are probably relics of earlier rift systems. They rise abruptly to 2200 m from the surrounding recently deposited ash soils of the plains at 1750 m. The ranges form an irregular east–west pattern with intervening grassy plains and minor valleys.

4. The Serengeti Plain occupies some 3000 km^2 in the west and southwest of NCA and extends westwards into the Serengeti National Park. The plain funnels gently from high points to the north and south down to 1580 m at Olduvai Gorge. The gorge is a deeply incised seasonal streambed draining Lake

© Cambridge University Press www.cambridge.org