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Range Ecology at Disequilibrium: New Models of Natural Variability and Pastoral Adaptation  
in African Savannas by R. H. Behnke,; I. Scoones; C. Kerven

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or other aspects. Through his research Dr Sheikh-Abdi pays attention to the oral tradition of the Somalis, as it is an important element in the historical research into a predominantly oral society.

One important contribution by Dr Sheikh-Abdi is his revelation of the atrocity committed by the British forces against the followers of the Dervish movement. Previous works were written mostly by colonial officials who focused only on the fierce way Mohammed Abdulle Hassan dealt with those Somali clans who opposed him.

Before the arrival of colonialism in Somaliland, Somali society led a decentralised way of life. The colonial powers demanded a way of life contrary to the traditional one. Subsequently, Somalis responded violently. However, because of the lack of leadership, as the author maintains, this resistance was futile. Only with the appearance of Mohammed Abdulle Hassan did the Somalis become organised, under his leadership.

Knowing that the colonisers could not be defeated by force alone, Mohammed Abdulle Hassan, used words as arms. As words, spoken or written, have always been the most powerful means of communication, he skilfully used the communicative functions of Somali verse. He repeatedly sought to gain in verse what he had not succeeded in acquiring with arms. He designed his verse to enhance his cause, to encourage his followers or to scorn and discredit his enemies. However, in scorning his enemies he sometimes used to preach the pastoral ethos excessively, as Said Samatar writes, like an 'epigram that borders on the obscene'. It is here that Dr Abdi-Sheikh explores the dual poetic exchange between Mohammed Abdulle Hassan and his opponents, namely Ali Jama Habil and Ali Adan 'Ali Dhuh', as this throws light on the social dynamics of the period.

It is in the conclusion and the examination of the reasons for the disintegration of the Dervish movement that Dr Sheikh-Abdi's work falters. The reason why Mohammed Abdulle Hassan was such a controversial figure was his indiscriminate raiding, seizing and plundering of the property of the Somali clans he suspected were not favourable to his cause. This behaviour poisoned his relations with the Somali clans, who traditionally considered any crime against an individual as a crime against the clan to which the individual belonged. It also estranged him from other religious orders such as Qadiriya and Dandarawiya. The conflict spread to such an extent that the Dervish eventually killed Sheikh Awees Biyooley (Sheikh Uways bin Mohammed al-Baraawa) in Biyooley, the Qadiriya representative in the southern Somaliland, in 1909. The veteran Dervish Ismail Mire believed that what led to the collapse of the movement was the indiscriminate killing of holy men.

Despite the lack of emphasis on the gravity of the collapse of the Dervish, we cannot deny the invaluable contribution of Dr Sheikh-Abdi in the form of this inestimable scholarly work.

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R. H. BEHNKE, JR, I. SCOONES and C. KERVEN, *Range Ecology at Disequilibrium: new models of natural variability and pastoral adaptation in African savannas*. London: Overseas Development Institute for the Overseas Development Institute, the International Institute for Environment and Development and the Commonwealth Secretariat, 1993, 259 pp., £19.95, ISBN 0 85003 195 8.

Since the early decades of this century, successive administrations have tended to see pastoralists and their livestock as overgrazing and bringing about the progressive degradation of arid and semi-arid rangelands in Africa. Decades of livestock and range development interventions have sought to tackle these problems by changing

the systems of land tenure and livestock management seen as underlying them. Over a decade ago, Stephen Sandford put together some powerful criticisms of this conventional wisdom. Those criticisms, together with seminal work by Caughley, Bell and others, triggered off a revolution in our understanding of the ecological dynamics of arid and semi-arid rangelands. Rangelands are no longer seen as equilibrium systems which progress naturally along a sequence of successional vegetation stages towards a single climax, but which are easily pushed to a state of ecological collapse by the impact of outside influences such as grazing pressure or fire. Arid and semi-arid rangeland systems are instead coming to be seen as continuously moving between multiple, alternative, relatively stable states, largely driven by non-equilibrium, abiotic influences. In this view, grazing pressure and fire contribute to the observed state at any one time but are unlikely to be driving any long-term or irreversible trend, and are only two of many influences, the most powerful of which are probably non-anthropogenic factors. This changing view of rangeland ecology has fundamental policy implications for sub-Saharan Africa.

The present volume is based on a workshop held in 1990 to review evidence for (and against) this new paradigm. The volume comprises twelve chapters by English, French, Dutch, American and Australian contributors, bringing together expertise from North-east, East, South-east, South and West Africa as well as from Australian rangelands. The contributors span disciplines ranging from ecological anthropology to plant, animal and soil science, with approaches varying from literature review to analysis of historical data on livestock populations and mathematical modelling of vegetation and erosion processes. At least half the twelve chapters reproduce material that has appeared elsewhere, so the volume is useful mainly as a collection and review.

Behnke and Scoones's introductory chapter gives a well balanced and comprehensive review of the changing paradigm. They look at the mainstream view and develop the criticisms which Sandford originally levelled against it. They analyse the problems with using the concepts of carrying capacity and of Clementsian succession in the highly variable and unpredictable environments of arid and semi-arid rangelands. After Behnke and Scoones's introduction, perhaps the best parts of the book are those chapters which go some way towards testing the competing hypotheses generated by old versus new paradigms. Thus both Scoones and Tapson analyse the extent to which livestock population data are consistent with old or new views of rangeland processes. Broadly speaking, their results bear out the new paradigm for particular situations. Their findings suggest that the two opposed models may be the extremes of a continuum rather than mutually exclusive theories. The more arid and unpredictable the eco-system the more closely it corresponds to a 'disequilibrium' system, but the new view clearly has explanatory power even in relatively less arid rangelands. The classically expected density-dependent regulation of livestock populations, which operates through fertility decline or mortality increase as density rises, is only a weak influence in such systems. Density dependent regulation is either rarely apparent (Tapson, South Africa) or frequently interrupted by extreme climatic events which bring about massive livestock mortality that is independent of population density (Scoones, Zimbabwe). Other strong chapters model the implications of observed levels of erosion for long-term loss of productivity (Biot), and of patterns of stocking density and grazing pressure for erosion rates (Abel). Again, the findings are clearly consistent with the new paradigm, although they do not invalidate the old as far as other rangeland systems may be concerned. Stafford Smith and Pickup stress the importance of depositional as well as erosional processes in redistributing both soil and water and therefore productive patterns.

I found less satisfactory those chapters that tended to interpret observed data without really testing them (Coppock on the cycles of grazing-induced vegetation change

and recovery in Borana pastoralist areas of the Ethiopian plateau; Ellis *et al.* on the Turkana eco-system). Other chapters concentrate on ever more careful definition and estimation of relationships between rainfall, soil nutrients and production; of theoretical carrying capacities, feed supplies and stocking rates, and ever more detailed accounting for spatial heterogeneity. There is technical detail of considerable use in these chapters (de Leeuw and co-authors; de Ridder and Breman) but its complexities and fudge factors mean necessarily convoluted derivations of theoretical carrying capacities and stocking rates. Their limitations illustrate the criticisms that the new paradigm raises.

Most of the chapters review the development of ideas around the 'disequilibrium' theory, and some (Bartels *et al.*) are dedicated to this task. This seems to me to be the main weakness of the book. The ideas are rather well set out in the first chapter, to be rehashed with varying emphasis and clarity in most of the subsequent chapters. Ten years after Sandford's first clear and unambiguous statement of the central ideas, we should be concentrating on testing their validity and application in specific systems rather than restating the problem and reasserting untried faiths. Nonetheless, this book tackles an extremely important issue that is still not sufficiently well appreciated among policy-makers and some researchers in rangeland management and development. It should be required reading for anyone needing an update on the ecological processes of arid and semi-arid rangelands, and should give pause for thought to those involved in research or development interventions in these eco-systems.

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HANS HURNI and KEBEDE TATO (eds.), *Erosion, Conservation, and Small-scale Farming*. Berne: Geographica Bernensia, 1992, 595 pp., ISBN 3 906290 70 0.

This substantial volume presents selected papers from the sixth conference of the International Soil Conservation Organisation, held in Ethiopia and Kenya, 6–18 November, 1989. It contains forty-six papers summarising research and development activities from twenty-six countries worldwide. A brief preface by the editors provides the general context in which this diverse range of contributions must be set. It includes the increasing concern with questions of environmental sustainability, the debate leading up to the Earth summit at Rio in June 1992, and the recent widespread shift in approach towards more participatory development strategies building on the skills and priorities of small-scale farmers. Both Hurni and Tato have very extensive experience with erosion research and soil conservation programmes, particularly in the highlands of Ethiopia. The book would have benefited from a longer introductory essay to make the most of the differing contributions, and provide a clearer understanding of how soil scientists are actively addressing the challenge faced by more participatory development methods.

Of the book's six sections, the first three cover erosion assessments and processes, erosion modelling and applications, and the implications of erosion for soil quality and structure. *Africa* readers will probably find them of less interest than those in the second half of the book, which cover a range of applications and policy-related issues. However, a rapid reading of these technical sections is useful in understanding the assumptions and methods which lie behind statistics on soil loss and rates of erosion under differing conditions. When examining the range of potential measures for soil conservation, it is vital to have a clear idea of rates of soil loss, with and without a particular intervention. In the past, such rates were frequently calculated on the basis of figures derived from US or European conditions and, hence, often had little