Recent publications on livestock and the environment

**Staying Maasai? Livelihoods, Conservation and Development in East African Rangelands**

Katherine Homewood, Patti Kristjanson and Pippa Chenevix Trench, editors

**Livestock in a Changing Landscape: Drivers, Consequences, and Responses (Volume 1)**

Henning Steinfeld, Harold A. Mooney, Fritz Schneider and Laurie E. Neville, editors

**Livestock in a Changing Landscape: Experiences and Regional Perspectives (Volume 2)**

Pierre Gerber, Harold A. Mooney, Jeroen Dijkman, Shirley Tarawali and Cees de Haan, editors

Staying Maasai? delivers, in the authors’ words, ‘a much-needed reality check to correct national and international perceptions of contemporary Maasai ways of life’ (p. 369). The result of collaboration between 18 researchers over five years, the volume focuses on how Maasai households have responded to their varied and changing political, economic and natural environments. The analysis centres on case studies of five different areas – three in Kenya and two in Tanzania – representing the diversity of conditions in contemporary Maasailand: from high to low rainfall, from peri-urban to rural locations, from prime tourist destinations to sites with little appeal, and from areas with privately titled plots to communal lands.

The case studies analyse the returns to economic activities across all five sites, using a uniform research methodology based on field surveys with common variables, data collection methods and data analysis. The authors contextualize their quantitative analyses with descriptive portraits of individual families and in terms of institutional and policy analyses based on semi-structured interviews, formal village meetings and the review of unpublished documents. At the heart of the study is an appraisal of the changing...
importance for the Maasai of four different income streams – livestock, employment, cultivation, and wildlife conservation.

Livestock remain central to Maasai livelihoods as the single biggest contributor to household income across all income and wealth categories, and the single strongest predictor of other dimensions of wealth and income. These findings emphasize ‘the lasting economic importance and resilience of pastoral livestock production, not as some romanticized throwback to an earlier age, but as a robust and vital component of twenty-first century livelihoods in Maasai rangelands’ (p. 401).

- The continuing Maasai commitment to pastoralism is in no way indicative of conservatism. While governments and outside observers may assume the ineluctable transformation of pastoralists into agro-pastoralists, non-farm work is considerably more important than cultivation to the majority of rural Maasai, and second only to livestock in its contribution to mean household incomes: ‘Most Maasai are not so much agro-pastoralists as wage earning (or entrepreneurial) pastoralists’ (p. 383).
- Cultivation remains economically important, especially for poor households, and as a strategy to reinforce land tenure rights. Small-scale agriculture is a significant driver of land use change at many sites, but of paramount importance is the spread of large-scale cereal farming and horticulture, with its attendant adverse impacts of wildlife mobility and pasture access for livestock.
- To understand why cultivation continues to spread, even in areas with a greater than 50 per cent probability of total harvest failure, it is necessary to understand that wildlife conservation does not pay for the average rural dweller. With rare exceptions the proportion of rural Maasai households benefiting from wildlife tourism revenues is low, and the benefits that they receive are meagre and do not match those available from commercial cultivation. The result has been the conversion of rangeland into farmland and in Kenya the loss of 38 per cent of large mammal wildlife in twenty years.

The last three chapters of Staying Maasai? chart the policy failures that explain the perverse trajectory of wildlife conservation efforts in Kenya and Tanzania. At the heart of everything lies a failure of governance:

Tracing the extent to which revenue is captured by central government, by tourism cartels or other investors and even by local government, as opposed to village, households and individuals, helps explain negative local perceptions of conservation, and land use choices which are poorly compatible with wildlife. Where revenues initially accruing to the State or administrative unit are intended for onward distribution, there will be leakage at every stage as funds flow (or fail to flow) to successively lower levels (p. 398).
As the authors note, ‘This outcome runs directly counter to current donor-encouraged community-based conservation orthodoxy, creating a major gap between rhetoric and reality’ (p. 11). For government officials engaged in the private exploitation of their country’s natural resources, genuine community involvement simply does not pay: The rhetoric of community empowerment ‘has been as much a way for state agents to extend their influence in rural landscapes as it is a way to devolve power to local communities’ (p. 327). In Tanzania, for instance, the Maasai communities that had made the most progress in capturing benefits from wildlife were also the ones subjected to the most intense pressure from state wildlife authorities and systematically excluded from policy discussions. Staying Maasai? is indeed a much-needed, if painful, reality check.

The two volumes of Livestock in a Changing Landscape are a very different proposition. The list of institutions supporting these publications reads like a roster of the great and the good in policy-oriented agricultural and livestock research: the French Agricultural Research Centre for International Development (CIRAD), the Food and Agriculture Organization of the United Nations (FAO), the Swiss College of Agriculture, the International Livestock Research Institute (ILRI), the Livestock, Environment and Development Immitative (LEAD), the Scientific Committee on Problems of the Environment (SCOPE), and the Woods Institute for Environment at Stanford University. Clearly a lot of public money has been lavished on this effort. Why the published results are not freely available for download, but must be purchased at a combined cost of between $150 and $250, is not immediately obvious.

These are volumes that deserve careful scrutiny. All this short review can do is give notice of their existence and some brief description of their coverage. The scale of the effort and the institutions behind it suggest that we are witnessing the coalescence of a new official orthodoxy regarding the relationship between livestock and the environment in light of the livestock revolution, globalization and climate change. Those committed to pastoralism and pastoral studies may not like what we are about to hear, but we should listen very closely.

Volume 2, Experiences and Regional Perspectives, is made up of eight regional case studies of livestock, market and environmental interactions in the Horn of Africa, West Africa, India, Brazil and Costa Rica, China, the United States, and Denmark. These regional studies are bracketed by a short introduction and conclusion and supplemented by a case study on Nestlé’s milk procurement practices and the environmental performance of the company’s factories. The case studies are well written and comprehensive, and contain a wealth of information. The concluding paragraph of the volume correctly observes that, ‘The livestock landscape depicted in this volume is one of complexity…. It is thus not surprising that the experience emerging from the volume calls for tailored responses.’ (Vol. 2, p. 174).

Volume 1, Drivers, Consequences and Responses, is divided into three parts. Part I is on the drivers of change (4 chapters); Part II is on the environmental,
health and social consequences of livestock production (11 chapters). Part III on responses to livestock in a changing landscape (5 chapters) is described as ‘the central objective of the whole effort’ and examines ‘what social and institutional options are available and vital when considering bringing animal production systems toward more environmentally and socially sustainable practices’ (Vol. 1, p. 2). Like volume 2, the individual chapters in this volume are rich in detail and complexity. More problematic is the connection between these analyses and the broad generalizations that emerge at the conclusion of the exercise.

This review will focus on only one of these generalizations, but it is a generalization that is central to the entire analysis and should be of concern to those interested in pastoral welfare: the role of extensive livestock production in the global carbon cycle. In chapter 16, ‘Responses on environmental issues’ we are told that:

Both extensive and intensive forms of production contribute to environmental degradation but, overall, extensive production tends to have larger environmental impacts per unit of output. Extensive production is practiced by many poor producers who use natural grasslands, crop residues, and household and other waste as low-cost feed. A large part of the world’s pastureland is degraded, thereby releasing greenhouse gases, negatively affecting water cycles, and affecting vegetation and biodiversity. Pasture expansion into forests, often conducted by smallholders, has important consequences for climate change and biodiversity. ... Extensive production is often based on poorly fed ruminants with low productivity, emitting significant amounts of methane. (Vol. 2, pp. 311–12)

Despite the fact that intensive livestock production in developed countries depends on burning fossil fuel - which is generally accepted to be the root cause of global climate change - it would seem that extensive producers in poorer parts of the world who use relatively insignificant amounts of fossil energy are a greater threat to the climate. How so?

The explanation for this apparent anomaly lies in the weight given to land use change and methane as sources of the carbon fluxes associated with livestock production systems. Chapter 5 of Volume 2, ‘Livestock in the global carbon cycle’, recapitulates this interpretation, which first appeared in Livestock’s Long Shadow (Steinfeld et al., 2006) and has since reappeared in the World Bank’s most recent review of livestock policy, Minding the Stock: Bringing Public Policy to Bear on Livestock Sector Development (World Bank, 2009).

According to these analyses, tropical deforestation is the single largest contributor of CO₂ from extensive livestock production systems. However, as the regional case studies in Volume 2 make very clear, deforestation to create pasture is currently an acute problem in only one region, tropical Latin American, and is associated with one kind of production system - technically simple capitalist cattle ranching. Little is gained by relabelling this production
system ‘extensive’, thereby implying that tropical deforestation is a worldwide problem rather than a regional problem of worldwide significance. Also forgotten in this analysis is the role of temperate deforestation in ‘degrading’ the environment of medieval Europe to make way for arable agriculture and to provide the cultivated feed for intensive livestock production. At what point does degradation become sufficiently old, close to home and profitable to no longer be degradation? In any case, to imply that deforestation is broadly associated with extensive livestock systems but not part of intensive systems, or that it is a tropical rather than a temperate phenomenon, is untrue.

Uncertainty also surrounds the second degradation syndrome said to affect extensive systems – desertification. In the Sahel, the locus classicus of desertification, it is now clear that widespread anthropogenic desertification does not exist and that desert expansion and re-greening are driven by fluctuations in rainfall levels caused by variations in sea surface temperatures (Giannini et al., 2008; Herrmann et al., 2005). Desertification probably retreated in the rangeland areas of much of ex-Soviet Central Asia in the 1990s in the wake of collapsing livestock populations (Behnke, 2008; Kerven, 2003), but expanded in the Middle East and North Africa due to the subsidized provision of manufactured feed supplements (Nordblom and Shomo 1995; Seligman and Perevolotsky 1994). In China, on the other hand, rangeland degradation has resulted from expanding livestock numbers following market liberalization (Longworth and Williamson, 1993), and been exacerbated by policies that encourage fencing, fodder cultivation, and settlement (Wen Jun Li et al., 2007; Wu Zhizhong and Du Wen, 2008; Yan Zhaoli et al., 2005; Yina Xie and Wen Jun Li, 2008). In North Africa, the Middle East and China desertification may have been caused not necessarily by extensive management practices but by flawed attempts at state-sponsored intensification. But with the exception of the Sahel which has been so well studied, the evidence for or against widespread grazing-induced degradation is wobbly almost everywhere. In this situation, it is not difficult to uncritically collect bad news in order to build a big scary number that, in fact, refers to distinct processes of uncertain magnitude and severity. But neither is it helpful.

Finally, there is the issue of methane, a potent greenhouse gas produced by ruminant digestion, among other sources. Because grazing animals eat rough forage and mature slowly they produce comparatively large amounts of methane per unit of output. But the policy significance of this fact is not immediately clear. As competitors for the limited amount of forage that is naturally available, grazing by domesticated livestock replaced native ruminants across the steppes, plains and savannahs of much of pastoral Asia, the Americas and Africa. Almost certainly, this substitution marginally increased methane output from these regions, but the extent of this increase is unclear, as are the benefits that would be gained from shifting the balance back towards native ruminants. They may be prettier to look at, but there is scant evidence that saiga antelope, or bison or wildebeest produce significantly less methane than cattle. Much of the increase in ruminant methane production
since the Industrial Revolution has therefore come from ruminant populations with new sources of food – from farmed rather than grazing animals, or from graziers in Australia or humid tropical South America, where large native ruminant populations did not previously exist.

What, in conclusion, are the policy implications of emphasizing – or exaggerating – the problems of forest conversion, rangeland degradation and methane for extensive livestock systems? The Kyoto Protocol created the Clean Development Mechanism (CDM) whereby industrial countries could reduce global carbon emissions by financing renewable energy, energy efficiency or carbon sequestration projects in developing countries. Viewed in this context, the financial benefits of putatively degraded, poor, inefficient production systems are, paradoxically, quite large:

The potential for incremental accumulation of organic carbon in soils is huge, and adapting extensive livestock systems is the key to unlocking this potential. Technical options to revert pasture degradation and sequester carbon, particularly in the soil, by building up organic matter in the ground exist, and current pastures are probably the largest terrestrial carbon sink available. (Vol. 1, p. 314)

Extensive grazing systems offer the opportunity to increase the provision of environmental services over vast areas (e.g., carbon sequestration, water, biodiversity conservation) while diversifying income of poor holders through payment schemes. (Vol. 1, p. 316)

Because they are presumed to be technically inefficient and incapable of increasing production to meet increased demand, the opportunity costs of paying pastoralists to go out of business are negligible in terms of forgone output. Intensive, efficient and profitable First World livestock producers can thereby afford to continue to consume fossil fuels, buying this privilege by paying ‘local communities to provide incentives for biodiversity conservation’ (Vol. 1, p. 317). At what point do we call upon Staying Maasai? for another reality check? Community-based natural resource management was promoted by outsiders as a way for smallholders to profit from supporting conservation efforts. But often the money did not trickle down to smallholders and therefore they could not afford to support conservation. Why should we expect the disbursement of money generated by carbon credit schemes to be more equitable or effective?

This is a top-down, First World driven development agenda; this kind of thing has been tried before and it has a poor track record. There are, of course, alternatives: ‘It is by trying to understand how poor people manage their livelihoods and their natural resources in conditions of great difficulty that science can learn to make itself more useful to them, rather than by promoting transformations based on imported models’ (Mortimore, 2005; cited in Staying Maasai? p. 15).

Maybe next time.
References


