

Complementarity between Community-Based Animal Health Delivery Systems and Community-Based Wildlife Management? An Analysis of Experiences Linking Animal Health to Conflict Management in Pastoralist Areas of the Horn of Africa¹

Richard Grahn^{2,3} and Tim Leyland^{2,4}

Introduction

Community-based Animal Health Systems (CAHS) have been developing since the early 1980s across all continents. Their success in delivering animal health services to remote, marginalized, and under-served livestock-keeping communities and the consequent improvements in livelihoods has led to a concerted drive to ensure the sustainability of such delivery systems through privatization and the development of enabling policies and legislation. The process of underpinning the sustainability of CAHS has led practitioners and advocates of such systems to consider and respond to core non-animal health challenges to CAHS. Such constraints include poor access to markets, lack of voice of marginalized communities in policy processes, conflict, and the negative consequences of disaster relief strategies. After some success in building upon gains from CAHS to address core non-animal health challenges, practitioners are now examining the possible beneficial linkages between CAHS and sustainable wildlife management in pastoralist areas.

Situation of pastoralists in the Horn of Africa

This paper primarily addresses pastoralist communities in the Horn of Africa, but many of the principles discussed are applicable elsewhere. Throughout the Horn of Africa, pastoral communities are politically marginalized and suffer from increasing food insecurity, levels of violence, and worsening service provision. Pastoralists in the region mostly depend on livestock for their basic needs but are unable to develop these assets because of factors such as inadequate animal health services and limited access to adequate water sources. Pastoralists particularly prioritize livestock disease as a problem for very straightforward reasons: sick animals provide fewer offspring, less milk, and less meat; they are less economically and practically valuable. Disease, therefore, reduces household food consumption both directly and in-

directly, as fewer animals are available to sell or exchange for cereals. Although pastoralists possess extensive knowledge of their environment, livestock dominate economic and social functions in pastoral areas, and livestock keeping comprises the key livelihood strategy in areas with limited scope for other means of making a living.

While wildlife is a concern of pastoralists, it is viewed primarily from the perspective of how it can serve to improve their food security through bush meat consumption. The scale of bush meat consumption in Africa has been reported by Barnett (2000). This paper argues that approaches to Community-Based Natural Resource Management (CBNRM) that were rooted in community-held priorities would address pastoralists' key concerns such as food security and service provision. Conservation goals will be achieved in pastoral areas only if conservation initiatives are linked to tackling the pressing issues faced by pastoral communities. A recent study by the Department For International Development (DFID) estimates that as many as 150 million poor people (one eighth of the world's poorest people) perceive livestock to be an important livelihood asset (DFID 2002). Although aware of the loss of wild fauna and flora in their areas, pastoralists generally prioritize improved livestock health more than they desire wildlife conservation and management. If such initiatives do not contribute to maintaining and/or enhancing their livelihoods, pastoralists are likely to be less committed to collaborating in community conservation schemes.

It is our contention that Community-based Animal Health Systems could provide an opening for CBNRM initiatives in these areas in a way similar to how they have acted as an entry point for successful conflict management initiatives. CAHS have been successful because they benefit pastoralists directly, and experiences with conflict resolution show that pastoralists are keen to achieve peace because of the accompanying improvements to animal health and therefore livelihoods.

¹See abstract on p.xxviii.

²African Union/Interafrican Bureau for Animal Resources, Nairobi, Kenya

³Department For International Development, London, United Kingdom

⁴Tufts University, School of Nutrition, Science and Policy, Boston, MA, USA

Box 1. Some examples of the impact of Community-based Animal Health Workers (CAHW) on human livelihoods

- In Malawi, the savings from increased livestock production in those areas where CAHW were active was US \$57,000 in the year 1998–1999. Farmers with CAHW services were more likely to afford a tin roof, window glass, ox cart, plough, and radio than farmers without access to CAHW services (Hüttner 2000).
- In Afghanistan, CAHW programmes reduced mortality by 5% in calves, 10% in lambs, and 38% in kids, compared with control areas without CAHWs. The benefits to farmers were estimated to be US \$120,000 per district per year, while the costs of the programme were US \$25,000 per district (Schreuder *et al.* 1996).
- In a specified district, Kenya farmers without access to CAHW reported 70% more cattle deaths than those farmers who had access to CAHW. The decrease in mortality provided benefits worth US \$48 a year to each farmer using CAHW (Holden 1997).
- A review of Oxfam UK/Ireland’s CAHW project in northeast Kenya in 1998 compared livestock mortality in project and nonproject areas (Odhiambo *et al.* 1998). In nonproject sites, annual mortality in camels, cattle, and sheep and goats was estimated at 31%, 32%, and 25%, respectively, whereas in project sites, annual mortality was 20%, 17%, and 18%. The reduced loss of livestock was valued at Kenya Shillings 22,853 (approximately US \$350) for each household in the project area, and this sum was sufficient to buy grain to feed two adults and four children for 250 days.
- Established in 1998, a CAHW project in Simanjiro District, Tanzania, was assessed in May 2001. The use of interviews and participatory methods showed how Maasai pastoralists associated the CAHW service with reductions in calf mortality of between 59% and 93%. This led to increased sizes of milking herds and more cows milked per household. For example, the average number of cows milked per household increased from 5.3 to 24.2 cows. Communities concluded that the increased milk availability had a huge impact on local food security (Nalitolela *et al.* 2001).

Community-based Animal Health Systems

The concept of Community-based Animal Health Workers (CAHW) probably arose from experiences in the human health sector. The term “barefoot vets” (Halpin 1981) seems to derive from China’s successful and ongoing use of “barefoot doctors” to bring basic services to the general public, as described by Chetley (1995). In the early 1970s, the World Bank advocated that livestock producers’ associations should include “grassroots level para-veterinarians” (de Haan and Nissen 1985). This advice was influential and raised awareness. Since that time, various actors have developed and refined CAHW systems. For example, in eastern Africa, nongovernmental organizations (NGOs) and bilateral agencies have been particularly influential, whereas in

southeast Asia, government veterinary services have been at the fore in their development (Leidl 1996).

In a comprehensive review of available data, McCorkle (2003) estimates that CAHW initiatives have been implemented in 46 nations since the 1970s. A recent survey by the African Union/Interafrican Bureau for Animal Resources (AU/IBAR) identified over 390 CAHW projects in Horn of Africa countries alone. Growing interest in CAHW systems is largely related to the high impact on animal health and human livelihoods resulting from improved basic veterinary care in rural communities. Some examples of the impact of CAHW on livelihoods are shown in Box 1. Equally impressive documentation on the impacts of CAHS on livestock disease control and surveillance can be found elsewhere (Mariner *et al.* 1994, Hanks *et al.* 1999, Mariner 2002, Baumann 1993, Leyland and Catley 2002).

Box 2. Key requirements for sustainable and effective Community-based Animal Health Worker (CAHW) delivery systems

- Livestock owners perceive they have an animal health problem.
- Local communities participate in an interactive way in all aspects of service development, including defining the problem, planning, contributing time and resources, defining criteria for selection of CAHW, agreeing on a prescribed relationship with private vets (including payment of full cost for services rendered by CAHW and the government vets who regulate and monitor), selecting CAHW, conducting post-training reviews, monitoring, de-selecting CAHW who perform poorly, recognising refresher training, etc.
- The CAHW System is based on sound business principles in terms of capitalization, loans, turnover, reinvestment, and profit generation.
- Training is based on participatory and adult-learning methods, standardized but flexible to respond to needs within different communities.
- The roles and reporting relationships of the cadres of “CAHW,” “Animal Health Technicians,” and “veterinarians” are described and recognised by the veterinary authorities. This includes geographical definition of where CAHW are allowed to operate.
- The opportunity exists for private veterinary practitioners to be awarded contracts for provision of public good services (vaccination, disease surveillance) so that the so-called “sanitary mandate” is availed.
- The policies and strategies of the veterinary authorities towards Community-based Animal Health Systems (CAHS) are in line with practice and enforcement of veterinary professional legislation, including pharmaceutical supply laws.

Although CAHW have provided very useful primary animal health care services to livestock keepers, many projects have failed to address important technical, social, and sustainability shortcomings. Indeed, a very wide range of modes of project design and implementation are currently used, with varying levels of success. Common key weaknesses with CAHS include failure to fully involve communities in analysis of problems and solutions, and limited attention to financial sustainability (McCorkle 2003). Within Africa, many years of experience have demonstrated the importance of establishing CAHW systems as partnerships between communities, government, and the private sector. The key requirements for establishing sustainable CAHW projects are summarised in Box 2.

Incorporating CAHW systems and improving the quality of veterinary service delivery at a national level is a complex task. It requires long-term strategic and operational plans that are regularly reviewed, and that have the commitment and support of the national authorities. The process of establishing such services and the policy implications have recently been comprehensively described by Catley *et al.* (2002) and the IDL group (2003). It is our view that there is much that can be learned from CAHS in CBNRM, particularly as they can be seen to have many of the same requirements for success including a perceived problem, meaningful community participation, and policy-level support. It is equally the case that lessons for CAHS may be derived from the rich CBNRM literature, although this is beyond the scope of this paper.

Community-based Animal Health delivery Systems and conflict management

AU/IBAR has built on the success of CAHS to tackle the insecurity in the greater Horn of Africa that is an impediment to animal health service delivery. After real animal health benefits were seen, the pastoralists of the Karamojong cluster approached veterinary doctors and said in very simple terms, "Now that we have seen some benefits from your work with us, we want you to help us to solve our problem of livestock raiding and conflict." Whilst not being experts in conflict resolution, these veterinarians offered to bring together the traditional leaders from neighbouring communities that were in conflict with one another and where CAHS had been successful. Initial meetings were uneasy and risk prone but at the same time succeeded in initiating the dialogue that has subsequently made a significant contribution to conflict management (Grace 2001, Waithaka 2001, Minear 2001).

The key aspect of the success of these conflict management initiatives has been the high level of participation by pastoral communities, or "co-learning." AU/IBAR developed its conflict work in direct response to the request from elders to tackle conflict in order to really tackle animal health problems. Since then it has continued to base its methods and approaches on the suggestions and involvement of pastoral

communities. The methods have been continually revised as community members themselves create new ways of transforming their conflicts. For example, AU/IBAR followed the advice of youths and sought to involve pastoral women in peace dialogues, moving the conflict transformation activities to remote contested areas in order to understand their perspective on conflict and the role of women in preventing and provoking conflict.

Over time the confidence of communities in their development partners has grown, and the work has evolved into a two-pronged conflict management strategy of both rebuilding the authority of community elders over youths and of formalising natural resource management agreements. Methods designed to implement this strategy include community dialogues involving elders, youths, and women with politicians, local administrators, and cross-border counterparts (Border Harmonisation Meetings). These methods collectively fulfill the vital function of strengthening the role of elders within their own community and opening up the space for discussions about peace between communities that are traditionally in conflict. Through the deliberate involvement of local administrators, members of parliament, and other stakeholders, trust is increased between communities and those who represent them and those who are employed as administrators on their behalf (CAPE 2003a, ITDG-EA and CAPE 2003).

Similar to the approaches of AU/IBAR's conflict management initiatives, CBNRM aims to be genuinely participatory and should seek to tackle the concerns of pastoral peoples directly, based on their input. This will demonstrate tangible benefits to them and ensure that participation is meaningful and equitable. It is our view that the systematic strengthening of the role of elders could well prove useful in managing some types of wildlife-based conflict because elders are able to persuade community members to support or undermine CBNRM strategies. For example, the problem of poaching within buffer zones exhibits a strong similarity to issues of conflict management in support of animal health goals. The parallel in conflict work is that a handful of youths equipped with readily available modern semi-automatic weapons are able to undermine the traditional or formal peace agreements put in place by elders, regardless of the role played by outside actors. This phenomenon has been documented by the Community-based Animal Health and Participatory Epidemiology (CAPE) Unit with respect to its work with pastoral women in peace building (CAPE 2003a). However, as with all problems of collective action, it is critical that almost all members of the community adhere to the management approaches if they are to be effective. This is most elegantly theorised in the Prisoners' Dilemma, a situation in which all parties need to cooperate on the basis of imperfect information if they are to achieve the best possible outcome for all participants, but they usually opt for a second-best solution because they are not aware whether the other parties will cooperate. Taking, for example, the issue of poaching, a handful of community members who opt to disobey the agreed-upon CBNRM rules or customs can seriously undermine the conservation goals, for example, by poaching (or facilitating the poaching) of rare species.

Community-based animal health and conflict management at the policy level

Community-based success requires the interactive participation and buy-in of whole communities, particularly opinion leaders. But for community-based efforts and achievements to be sustained, national and local authorities need to provide a supportive policy and legislative framework. For example, there is a compelling case that CAHS need to be made sustainable through privatization, but in many countries of the Horn of Africa legislation prevents this. Using conflict management, communities can resolve to live peacefully and share natural resources and establish local early warning and response mechanisms. However, governments still need to provide security and to recognise and cooperate with such grassroots structures. Above all, governments need to integrate their security concerns with the development priorities of pastoral areas to ensure that the root causes of conflict in pastoral areas are tackled over time.

For community initiatives to succeed under conditions of poverty and marginalization, enabling policy and legislation are vital, but it is not always clear what the correct policies and legislation should be. This is particularly true in pastoral areas, where policymakers often have a poor understanding of pastoral livelihoods. It is for this reason that AU/IBAR, along with many others, has concluded that community empowerment is required. Providing a platform for pastoral communities to advocate their own concerns is crucial (Sones and Catley 2003, CAPE 2003b). Over time, pastoralists and other marginalized communities will be able to influence policies and laws to make them more supportive of their development priorities and consequently improve their livelihoods.

Linking Community-based Animal Health Systems and community-based wildlife management

Many wildlife-rich areas in the Horn of Africa are located in arid and semi-arid areas. These are the same areas where CAHS have proved highly effective. In these agro-ecological areas, pastoralist or agropastoralist lifestyles predominate (Barrow *et al.* 2001). Transhumant nomadic pastoralist communities often move close to wildlife-rich areas either on a seasonal basis or during times of hardship. These pastoralists are often neglected by policymakers and administrators. In many instances pastoralists have had access to their dry-season grazing lands restricted when these areas are designated as protected areas. Outside the conservation areas, large dispersal zones are required for mobile wildlife species to cross. The people on whose land mobile species graze and travel across are key stakeholders in conservation and must be recognised as such, even if they are remote from protected areas (Adams and Hulme 2001).

It is also worth noting that the communities one most strongly associates with pastoralism are very often those one associates with conservation, for instance the East African Maasai communities of the Maasai Mara, Serengeti, Amboseli, and Ngorongoro. During discussions with pastoralists in the Horn of Africa about their problems, veterinarians have been surprised to discover that opinion leaders have consistently expressed concern about the loss of wildlife and damage to the environment through uncontrolled burning of rangeland. These communities, although depleting their wildlife stocks over the last 30 years because of easy availability of guns, social unrest, and the breakdown of traditions, are aware that they are losing something rich and meaningful to their lives.

A key opportunity for linking CAHS, conflict management, and CBNRM can arise from the fact that pastoralist communities are often aware of the wildlife loss problem and the causes of wildlife destruction through, for example, uncontrolled habitat burning. The pastoralists themselves have made numerous recommendations to their veterinary partners facilitating CAHS about the need to do more to “to preserve the wildlife for the benefit of posterity.” Box 3 shows some of the typical views of pastoralists on the causes of and solutions to wildlife destruction in pastoralist areas. As the voice of pastoralist groups in the Horn of Africa is slowly growing through efforts to strengthen pastoralist civil society groups, the opportunity to engage them on wildlife issues should be taken.

One consistent request that pastoralists pass on to their veterinary partners is for assistance with control of problem animals, for instance, elephants invading crops or predators killing or maiming livestock or people. This theme emerges time and again in conservation and CBNRM literature (Barnett 2000). In our own fieldwork, the issue of hyaena has been of particular concern to pastoralists.

It is evident that some CBNRM initiatives have improved pastoralist livelihoods (IIED 1994, Child 1995, Child 1996, Murphree 2000). Documented examples of CBNRM where tangible benefits have accrued to community members include the DFID-funded Mpomiba project with 19 villages close to the Ruaha National Park in Tanzania and the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ)-funded project with 40 villages adjacent to the Selous Conservation Area. In Namibia, the National Community Wildlife Conservancy Programme has led to the registration of significant numbers of community-owned conservancies, many of which have entered into private-sector joint ventures. In Zimbabwe, the Communal Areas Management Program For Indigenous Resources (CAMPFIRE) programme has enabled communities to sell hunting quotas and secure incomes from wildlife tourism. Even though the current political situation means that the scheme is now on hold, CAMPFIRE has proved exceptionally influential in conservation and wildlife management thinking.

In general, pastoralist communities are likely to perceive the main CBNRM benefits to be the managed and more sustainable cropping of bush meat, increased revenues gained from consumptive tourism (hunting) and nonconsumptive

Box 3. Root causes of wildlife destruction and indiscriminate burning of pastures and forage, and elders' suggestions for addressing wildlife destruction, as given during cross-conflict-line elders' meetings in the Karamojong Cluster (1999–2002)

Root causes of wildlife destruction and indiscriminate burning of pastures and forage

- Wrong impression that game is the immediate food solution to severe drought.
- Livestock raiders on either side rely on wildlife for food while staging a raid through bush, which houses the game animals.
- Wars that erupted in Africa increased the number of guns in pastoral areas; these guns were used for extensive hunting.
- The notion that there is no owner of the wildlife.
- The notion that the game will always be around.
- Accidental fires by honey harvesters or children roasting hares, squirrels, etc.
- Burning some portion of pasture to clear ticks – then fires become wild.
- Raiders intentionally but secretly burn the neighbours' pasture to force them to move nearer for ease of attack.

Elders' suggestions for addressing wildlife destruction

- Stop cattle raids by making peace.
- Create alternative means of livelihood to avoid poaching, e.g., trade, crop agriculture.
- Game life is no longer an answer to famine or protein needs (this is because the pastoralists have killed game animals en masse and game numbers have been drastically reduced); the elders pledged to change their attitude and pass the message to their youth in order to save their heritage.
- Stop bush fires so as to preserve the bush habitat of wildlife.
- Governments and development agencies should promote environmental protection services at parish and location levels.
- Communities should stop using the "burning technique" to promote new grass; this can be achieved through community education and self-policing.
- Game departments should intensify efforts to rid pastoral areas of poachers.
- Promote tree planting and the establishment of small tree nurseries.
- Wildlife department and veterinary personnel should cooperate to treat sick game.
- Game department should have a strong presence in the pastoral regions.
- Create awareness of importance of wildlife to development.
- If situation becomes desperate because of severe drought, introduce relief food to people to save the game life.

tourism (wildlife viewing), or enterprise and employment opportunities in the tourism sector. There are also indirect gains in which investments in wildlife-related tourism lead to improved infrastructure such as roads, water mains, electricity, and communications.

It is our view that pastoralists are more likely to address issues of wildlife and habitat destruction once their more crucial livelihood problems (particularly animal health and conflict) are being solved. Thus, CBNRM schemes are more likely to succeed if linked to CAHS and if they are seen to help address key wildlife community concerns such as losses arising from predators like hyaena. After addressing a real and worrying problem, pastoralist leaders will be more open to discussing other issues. The authors do not currently have an acceptable solution to hyaena attacking livestock and people.

At the ethical level, it should be noted that pastoral communities bear many of the costs of global conservation initiatives. They are the exceptionally poor communities who find themselves unable to enter land they have historically called their own, who are unable to follow traditional transhumance

and grazing patterns, and who lose animals and crops to wildlife. Levels of investment in conservation are significant. The World Bank for example has built up a portfolio of conservation projects worth around US \$2 billion over the last decade, and the Global Environment Facility (GEF) has more than 400 biodiversity projects in 140 countries worth US \$5.4 billion (DFID 2002). There is a powerful case that the particular concerns of pastoralists with regard to wildlife should be addressed, at the very least because they bear many of the costs of providing these global public goods. When the pastoralists open the door and admit they have a problem of wildlife loss, the opportunity to assist should be taken.

Conclusion

In conclusion, there are good grounds to think that CAHS can be linked to CBNRM and, indeed, that there are lessons to learn from both literatures. CBNRM cannot work when pastoralists remain risk prone and food insecure. CAHS help to strengthen pastoralist livelihoods through increased

productivity and access to markets. Furthermore, they build trust and confidence. Both of these factors will allow CBNRM a higher chance of success. In pastoralist areas, conservationists need to consider how they can link CAHS and CBNRM and learn lessons from the experiences of enhancing CAHS and community-based conflict resolution and management. This consideration should not be limited to wildlife-rich areas but should also include the much wider dispersal zones and areas. It is our view that the comple-

mentarities and similarities we have outlined warrant further exploration and consideration, preferably in discussion between practitioners of the two approaches, community-based wildlife management and community-based animal health care, as well as with the pastoralists themselves, who are also wildlife custodians.

References

- Adams W, Hulme D. Conservation and community: changing narratives, policies and practices in African conservation. In: Hulme D, Murphree M (eds). *African Wildlife and Livelihoods: the Promise and Performance of Community Conservation*. Oxford, UK: James Currey Ltd; 2001. pp.9–23.
- Barnett R (ed). *Food for Thought: the Utilization of Wild Meat in Eastern and Southern Africa*. Cambridge, UK: TRAFFIC; 2000. Accessed executive summary Apr 2004 at www.traffic.org/bushmeat/executivesummary.html
- Barrow E, Gichohi H, Infield M. The evolution of community conservation policy and practice in East Africa. In: Hulme D, Murphree M (eds). *African Wildlife and Livelihoods: the Promise and Performance of Community Conservation*. Oxford, UK: James Currey Ltd; 2001. pp.59–61.
- Baumann MPO. Animal Health Services in Somalia: Can centralised structures meet demand in the field? In: Baumann MPO, Janzen J, Schwartz HJ (eds). *Pastoral Production in Central Somalia*. Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH, Eschborn. GTZ Book No. 237. 1993. pp.299–321.
- Catley A, Blakeway S, Leyland T (eds). *Community-based Animal Healthcare: a Practical Guide to Improving Primary Veterinary Services*. London, UK: ITDG Publishing; 2002. 360pp.
- Chetley A. *Paying for Health: New Lessons From China*. IDS Policy Briefing. Brighton, UK: Institute of Development Studies; 1995:4.
- Child G. *Wildlife and People: the Zimbabwean Success*. Harare, Zimbabwe: Wisdom Foundation; 1995.
- Child G. Zimbabwe. In: Lutz E, Caldecott J (eds). *Decentralization and Biodiversity Conservation*. A World Bank Symposium. Washington, DC, USA: The World Bank; 1996. pp.125–140.
- Community-based Animal Health and Participatory Epidemiology Unit (CAPE). *Pastoral Women as Peacemakers*. Nairobi, Kenya: CAPE Unit, African Union/Interafrican Bureau for Animal Resources. 2003a. Accessed Apr 2004 at [www.eldis.org/fulltext/Pastoral WomenAsPeacemakersApril2003.pdf](http://www.eldis.org/fulltext/PastoralWomenAsPeacemakersApril2003.pdf)
- Community-based Animal Health and Participatory Epidemiology Unit (CAPE). *Pastoral Visions: Photographs and Voices From the Karamojong Cluster*. Nairobi, Kenya: African Union/Interafrican Bureau for Animal Resources. 2003b. Accessed Apr 2004 at www.eldis.org/pastoralism/cape/pastoral_visions/about/index.htm
- de Haan C, Nissen NJ. *Animal Health Services in Sub-Saharan Africa: Alternative Approaches*. World Bank Technical Paper Number 44. Washington, DC, USA: The World Bank; 1985.
- Department For International Development (DFID). *Wildlife and Poverty Study*. Report prepared by the Livestock and Wildlife Advisory Group. DFID's Rural Livelihoods Department. London, UK: DFID; 2002. 80pp.
- Grace D. *Pastoral Harmonisation Initiative: Second International Meeting*. Nairobi, Kenya: Community-based Animal Health and Participatory Epidemiology Unit (CAPE), Pan African Programme for the Control of Epizootics (PACE), Organization of African Unity/Interafrican Bureau for Animal Resources (OAU/IBAR); 2001. Accessed Apr 2004 at www.eldis.org/fulltext/pastharmon.pdf
- Halpin B. *Vets – Barefoot and Otherwise*. Pastoral Network Paper No. 11c. London, UK: Overseas Development Institute; 1981.
- Hanks J, Oakley R, Opoku H, Dasebu S, Asaga J. *Assessing the Impact of Community Animal Health Care Programmes: Some Experiences from Ghana*. Accra, Ghana: Veterinary Epidemiology and Economics Research Unit, Department of Agriculture, University of Reading, Reading, UK, and the Livestock Planning and Information Unit, Veterinary Services Department, Ministry of Food and Agriculture; 1999.
- Holden S. *Community-Based Animal Health Workers in Kenya: Example of Private Delivery of Animal Health Services to Small Scale Farmers in Marginal Areas*. Livestock in Development/DFID Policy Research Programme R6120CA. Nairobi, Kenya; 1997.
- Hüttner K. *Impact Assessment of a Community-Based Animal Health Service Program in Northern Malawi*. Masters thesis. Epidemiology Centre, Massey University, Palmerston North, New Zealand; 2000.
- IDL Group (eds). *Community Based Animal Health Workers – Threat or Opportunity*. Crewkerne, Somerset, UK: The IDL Group; 2003.

- Intermediate Technology Development Group-East Africa (ITDG-EA) and Community-based Animal Health and Participatory Epidemiology Unit (CAPE). *The Moroto Cross-Border Peace Meeting*. 6–7 Jun 2003, Moroto, Uganda. Nairobi, Kenya: African Union/Interafrican Bureau for Animal Resources. Accessed Apr 2004 at www.eldis.org/fulltext/morotomeetingreport6-7june2003.pdf
- International Institute for Environment and Development (IIED). *Whose Eden? An Overview of Community Approaches to Wildlife Management*. A report to the Overseas Development Administration of the British Government. London, UK: IIED; 1994.
- Leidl K. Development of primary animal healthcare systems: examples based on the animal health project in northeast Thailand and basic animal health service project in northern Malawi. In: Zimmerman W, Pfeiffer DU, Zessin KH (eds). *Primary Animal Health Activities in Southern Africa*. Proceedings of an International Seminar held in Mzuzu, Malawi, 26 Feb–8 Mar, 1996. Feldafing, Germany: German Foundation for International Development, Food and Agriculture Centre; 1996.
- Leyland T, Catley A. *Community-Based Animal Health Delivery Systems: Improving the Quality of Veterinary Service Delivery*. Paper prepared for the Office International Epizootics Seminar. Tunis, Tunisia: Organisation of Veterinary Services and Food Safety. World Veterinary Congress; 2002.
- Mariner JC, Akabwai D, Leyland TJ, Lefevre PC, Masiga WN. Strategy for the eradication of rinderpest from Africa with thermostable vero cell-adapted rinderpest vaccine. *Proc Intl Symposium on Morbillivirus Infections*. Hannover Germany: Hannover Veterinary School; 12–13 June 1994.
- Mariner JC. Community-based animal health workers and disease surveillance. In: Catley A, Blakeway S, Leyland T (eds). *Community-Based Animal Healthcare: A Practical Guide to Improving Primary Veterinary Services*. London, UK: ITDG Publishing; 2002. pp.240–272.
- McCorkle CM. Community-based animal health workers: the story so far. In: The IDL Group (eds). *Community Based Animal Health Workers – Threat or Opportunity*. Crewkerne, Somerset, UK: The IDL Group; 2003.
- Minear L. *Pastoralist Community Harmonization in the Karamoja Cluster: Taking it to the Next Level*. Medford, MA, USA: Feinstein International Famine Center, Friedman School of Nutrition Science and Policy, Tufts University; 2001.
- Murphree MW. Community conservation and private business: a case study from Mahenye, Zimbabwe. In: Hulme D, Murphree M (eds). *African Wildlife and Livelihoods: the Promise and Performance of Community Conservation*. Oxford, UK: James Currey Ltd; 2000. 320pp.
- Nalitolela S, Allport R, Ndanu H, Shongon L. Impact of animal health improvement on food security of a pastoralist community in Simanjiro District. *Proc. 19th Tanzania Veterinary Association Annual Scientific Conference*. Arusha, Tanzania: Tanzania Veterinary Association; Dec 2001.
- Odhambo O, Holden S, Ackello-Ogotu C. *OXFAM Wajir Pastoral Development Project: An Economic Impact Assessment*. Nairobi, Kenya: OXFAM UK/Ireland; 1998.
- Schreuder BEC, Moll HAJ, Noorman N, Halimi M, Kroese AH, Wassink G. A benefit-cost analysis of veterinary interventions in Afghanistan based on a livestock mortality study. *Prev Vet Med*. 1996;26:303–314.
- Sones KR, Catley A (eds). 2003. *Primary Animal Health Care in the 21st Century: Shaping the Rules, Policies and Institutions*. Proc Intl Conf, Mombasa, Kenya. Nairobi, Kenya: African Union/Interafrican Bureau for Animal Resources; 15–18 Oct 2002. Accessed Apr 2004 at www.eldis.org/fulltext/cape_new/MombasaProceedingsEnglish.pdf
- Waithaka D. *Breaking the Spears and Cooling the Earth: An Analytical Review of the Pastoral Communities Harmonisation Initiative*. Nairobi, Kenya: Community-based Animal Health and Participatory Epidemiology Unit (CAPE), Pan African Programme for the Control of Epizootics (PACE), African Union/Interafrican Bureau for Animal Resources (AU/IBAR); 2001.