



Emory Program in
Development Studies
Emory College of Arts and Sciences

Select Annotated Bibliography on Climate Variability and Its Effects on Pastoralist Welfare and Livestock Markets (updated 12/2011)

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Ethiopia and Kenya' (CHAINS) Project,' based at the Emory Development
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Atlanta, Georgia, USA

(revised December, 2011)

Note:

This is a working bibliography that is an update from the draft that was produced for the project research meeting that was held in Addis Ababa, June 20-21, 2011. It is not meant to be exhaustive but merely to cover some key literature associated with climate variability/change, pastoralist welfare and livestock marketing systems, with a special focus on Kenya and Ethiopia. The bibliography is divided into two general sections. The first are those annotations that were written by Chantalle Okondo, a graduate student at Emory University, and they are based on library research at Emory University. The second part includes annotations by Dejene Negassa based on library and archival research in Ethiopia. This bibliography was commissioned as background work for a planning grant on ‘Climate variability, pastoralism, and commodity chains in Ethiopia and Kenya (CHAINS)’ based at Emory University. The grant is part of the Livestock-Climate Change Collaborative Research Support Program (LCC CRSP), Colorado State University, Fort Collins, Colorado.

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Part I: US Library-based Literature

Annotations by Chantalle Okondo, Emory University

The effects of climate variability on African pastoralists and their welfare, on livestock markets, pastoralist environment, and/or the livestock herds of pastoralists, animal disease, food security

1. Climate change impacts on pastoralist environment

Angassa A. and Oba G., June 2007 *Relating long-term rainfall variability to cattle population dynamics in communal rangelands and a government ranch in southern Ethiopia* Agricultural Systems Vol 94 Issue 3 June 2007 Pages 715 – 725

This study reconstructed 21 years of household cattle population data in key resource and non-key resource (pond-water) rangelands in southern Ethiopia, to analyze the relationship between long-term rainfall and cattle population dynamics. The evidence of density-dependence was relatively important at the local land use level as compared with the regional level. Cattle population below carrying capacity under ranch management did not reduce herd die-offs, suggesting that rainfall variability, not density, had greater influence on cattle population dynamics. The evidence that droughts were more harmful to breeding females and immature animals than to mature males suggested that drought management needs to focus on herd recruitment potential.

Angassa, A. and Oba, G 2008. *Bush Encroachment Control demonstrations in southern Ethiopia: 1. Woody species in Survival Strategies with implications for herder land management.* African Journal of Ecology 47, 63-76

The researchers investigated six different bush encroachment control treatments on the responses of 29 woody species in southern Ethiopia. Bush encroachment control is a worldwide concern in savanna ecosystems where the problem seriously affects the pastoral industry. They found that the effect of tree cutting and fire greatly reduced woody species regeneration while tree cutting and fire combined with grazing treatment was more effective in reducing coppicing. The authors say that responses of individual woody species to the different bush encroachment control

methods have important implications for management, conservation policy and public education, which in the future should be promoted through herder participatory research and extension.

Bassi, M and Boku T. (2007). GEM-CON-BIO Case Study Report: *Borana-Oromo Community Conserved Landscapes, Ethiopia*, CENESTA, Governance and Ecosystems Management for the CONservation of BIODiversity Project

The authors present the case of the Borana Conserved Landscape which is a community conserved area in Southern Ethiopia, where conventional conservation and collaborative management have been implemented. It is a territory managed in a sustainable and eco-compatible way through customary institutions and according to customary laws. International aid gave the government and some international NGOs the possibility to unilaterally implement development plans in total disregard of customary management of natural resources. These initiatives the authors say have produced negative environmental impacts and have seriously affected the customary system of water and grazing rights with negative impacts on social relations, equity and biodiversity as a whole. The customary leaders of the Borana have explicitly announced the intention to conserve biodiversity along with normal pastoral sustainable livelihoods in the territory they inhabit.

Brocklesby M., Hopley M., Scott-Villiers March 2010 *Raising Voice- Securing a livelihood: The role of diverse voices in developing secure livelihoods in pastoralist areas in Ethiopia* Institute of Development of Studies, University of Sussex, UK

This working paper examines the use of voice among working pastoralists in Ethiopia, to be a successful pastoralist you have to use one's voice. People want to build capabilities to develop and manage assets, make demands, and secure and give support. Poor pastoralists, clustering in increasing numbers around the edges of settlements, say that they are becoming powerless objects of state welfare, disconnected and unable to regain competence, still less contribute to society's wellbeing. The response of pastoralist leaders has been to increase the level of engagement between different pastoralists, while increasing the intensity of their public engagements with the state.

Ericksen S., Lind J., 2008. *Adaptation as a political process: adjusting to drought and conflict in Kenya's drylands*. *Environmental Management* 2009 May; 43(5):817-35. Epub 2008 Aug 23.

This journal article presents findings on an investigation of how people access livelihood adjustment options and promotes particular adaptation interests through forming social relations and political alliances to influence collective decision-making. It reports that climate change adaptation policies are unlikely to be successful unless the political dimensions of local adaptation are considered. Strengthening adaptive capacity may require addressing imbalances in the distribution of powers and resources within a political system that produces and maintains development inequalities.

Ericksen S., Marin A., 2011. *Pastoral Pathways, Climate change adaptation lessons from Ethiopia*. Department of International Environment and Development Studies, Norwegian University of Life Sciences.

The report highlights the need for a new kind of development approach that ensures social equity and environmental integrity. It examines sustainable adaptation which the authors explain as adaptation to climate change that contributes to sustainable development pathways. The authors look at four normative principles that have been developed to guide policies and interventions, towards achieving development pathways that strengthen both social equity and environmental integrity. They examine the practical implications of these principles in an Ethiopian pastoral context.

Hailegiorgis A. B., Kennedt W.G., Roulea M., Bassett J.K., Coletti M., Balan G.C., and Gulden T., 2010. *An Agent Based Model of Climate Change and Conflict among Pastoralists in East Africa*. International Congress on Environmental Modeling and Software Modeling for Environment Sake

The authors present an agent-based model of human-environment interaction and conflict in East Africa using the MASON agent-based simulation environment (which is a multipurpose simulation library for the Java programming language). The model focuses on the complex interaction of pastoral groups with their environment and other emerging external actors. The model also supports the observation that increased seasonal rainfall variability and droughts create tremendous stress on pastoralists groups and challenges their long-term resilience and

adaptive response mechanisms. The researchers believed that the agent based modeling framework was the most effective modeling approach for the study of potentially chaotic systems.

Homman S., Rischkowsky B., Steinbach J., December 2007 *The effect of development interventions on the use of indigenous range management strategies in the Borana lowlands of Ethiopia*. Land Degradation and Development Vol. 19, Issue 4 pages 368- 387 July/August 2008

This paper analyses the changes in indigenous range management among the Borana pastoralists and the role of development interventions. Indigenous range management strategies and pastoralists' current use of key strategies before and after the last drought were compared based on pastoralists' information about land-use change collected through participatory appraisals, land-use mapping, and household surveys. The paper talks about how water development and introduction of government-imposed administration has disturbed the indigenous institutional networks and negotiation procedures for controlled herd movements. Aggravated by human population growth, this reinforces a higher and more permanent grazing pressure, leading to the deterioration of rangelands.

Humanitarian Policy Group April 2009 *Demographic trends, settlement patterns and service provision in pastoralism; Transformation and opportunity* Overseas Development Institute, London, UK

The synthesis paper presents patterns and trends that describe the transition process that pastoralism is going through, and explores factors influencing it. The author says that an integrated development approach would be more effective in supporting livelihood systems and enabling pastoralists to recover and maintain their inherent resilience and self-reliance. Some of the recommendations provided include East African nations take into consideration issues concerning demographic trends, settlement patterns and service provision in development interventions. Also that decentralization, participatory political decision-making, recognition of the cultural and economic value of pastoralism and recognition of the citizenship of pastoralists (through inclusion in censuses and the extension of official documents) is promoted.

Humanitarian Policy Group April 2009 *Pastoralism and Climate Change: Enabling Adaptive Capacity* Overseas Development Institute, London, UK

This synthesis paper argues that of all the natural resource-based land uses in the drylands, pastoralism functions best within the prevalent context of wide rainfall variability and unpredictability. With the right policies, investment and support, pastoralism presents a logical adaptation route in areas of increased climatic variability, and has an important role to play where other livelihoods are likely to fail. Some of the recommendations the author mentions include calculation of full socio-economic costs and benefits estimates for different adaptation strategies involving pastoralists. Also that there should be a focus on water management at national, regional and local levels to reduce risks from flooding and capture rainfall for agricultural, livestock and ecosystem use, through a mix of micro- and larger-scale investments.

IUCN (2011). *The land we graze: A synthesis of case studies about how pastoralists' organizations defend their land rights*. IUCN ESARO office, Nairobi, Kenya. viii + 48pp.

The report is based on 21 case-studies, from 17 countries in four continents, and it describes how pastoralists successfully defended their land rights. Property and land use rights are highly complex in the pastoralist communities, and because of their complexity they are continuously contested and renegotiated. The authors find key themes after examining the case studies e.g. because of the global trading system competition for access to and use of resources has emerged and that land reform has led to an improvement of the legal position of the population. The case studies describe various methods of taking actions for making legal claims and asserting rights that tackle the main issues pastoralists encounter. The authors recommend the type of action chosen depends on the given situation and the culture and traditions of the concerned communities; therefore it is essential to have a careful assessment of the situation before deciding on the steps to be taken.

Kamara A., Kirk M., and Swallow B., 2004 *Property Rights and Land Use change: Implications for sustainable resource management in Borana, Southern Ethiopia*. Journal of Sustainable Agriculture Volume: 25 Issue: 2 Pages: 45-61

The paper presents how the Borana rangelands are in a crisis with limited success of development interventions, due to increasing pressure on the range lands-appropriation of land by private individuals, with aggravated impacts of droughts, emerging conflicts and destitution.

These trends the authors show are hypothetically attributed to various factors, including climatic, demographic and market forces. The paper utilizes data from forty pastoral communities in the area to identify the causes of these trends and potential consequences on rural livelihoods. The study infers that the Borana pastoral system is in transition, with evidence of departure from traditional pastoralism to a semi-sedentary system with increasing reliance on oil crops and private grazing.

Kandagor, Daniel October 2005 *Rethinking Pastoralism and African Development: A Case Study of the Horn of Africa*, <http://www.codesria.org/IMG/pdf/kandagor.pdf> (accessed 02/26/2011)

The research paper discusses issues regarding problem of land tenure and land rights, to gender inequality, the causes and effects of pastoralist marginalization, the role of traditional institutions in pastoral societies, and restrictions on pastoralists' freedom of movement. The aim of this paper is to address the issues affecting pastoralists, identify the areas in which NGOs and other agencies duplicate work, identify ways in which academics, NGO and other agency representatives, and government officials can be brought together to back a unified strategy to address the problems faced by pastoralists in the Horn of Africa so as to enhance economic development.

Kassahun A., Snyman H. A., and Smit G. N., July 2008 *Impact of rangeland degradation on the pastoral production systems, livelihoods and perceptions of the Somali pastoralists in Eastern Ethiopia* Journal of Arid Environments Vol. 72 Issue 7 July 2008, Pages 1265 – 1281

This research paper carries out a survey with the aims of assessing the status and trends of rangeland degradation, and understanding the impact on livelihoods and perceptions of the pastoralists over a 60-year period. The results revealed that changes in vegetation ecology have drastically ($p < 0.05$) altered the livestock species composition in favor of camels and small ruminants rather than cattle. This has also influenced the planning and preference of pastoralists for different types of livestock. Traditional coping mechanisms are reported to be failing due to increasing environmental and rangeland degradation and lack of national policies to minimize or solve the problems. These findings offer a new perspective for communal rangeland management research, particularly in arid and semi-arid areas.

Mureithii S. M., Opiyoi F. E. O. 2010. *Resource use planning under climate change: Experience from Turkana and Pokot pastoralists of Northwestern Kenya*.
[http://www.dewpoint.org.uk/Asset%20Library/ICID18/16-MUREITHI et al ICID+18.pdf](http://www.dewpoint.org.uk/Asset%20Library/ICID18/16-MUREITHI_et_al_ICID+18.pdf)
(accessed 02/28/2011)

This paper presents the experiences and lessons learned in resource use planning process amongst the Turkana and Pokot pastoralists with special focus on means to increase sustainable access to pasture and water. It documents experiences on participatory resource use planning in northwestern Kenya rangelands as an instrument for empowering pastoral communities to increase sustainable access to dry season key resources - pasture and water. The paper also demonstrates how resource use planning can be applied to cushion pastoralists against the effects of climate change and shock. The investigators report findings that development of an integrated resource use plan in northwestern Kenya is essential in minimizing some of the major land-use competition and resource conflicts taking place in these rangelands.

Neely, C. and S. Bunning. 2008. *Review of Evidence on Dryland Pastoral Systems and Climate Change: Implications and opportunities for mitigation and adaptation*. FAO – NRL Working Paper. Rome, Italy.

The authors present how environmental crises such as climate change, biodiversity loss, drought and desertification are all inter-related and are symptoms of unsustainable land management. They recommended a globally coordinated effort to overcome the socio-political and economic barriers to addressing climate change risks through effective grassland management. The authors propose the way forward to include greater recognition and support for sustainable pastoral and agro pastoral systems in view of their contributions to climate change adaptation and mitigation, disaster risk management and sustainable agriculture and rural development. Support from governments, civil society organizations and other stakeholders are needed to provide incentives, pro-poor livestock policies, targeted research etc.

Ngugi M.K., and Conant R.T. May 2008 *Ecological and social characterization of key resource areas in Kenyan rangelands* Journal of Arid Environments Vol. 72 Issue 5 May 2008 Pages 820-835

This paper examines how and why do some key resource areas (KRAs) support herbivores during droughts when forage is scarce in other areas of the landscape? The authors hypothesized that KRAs have fundamental ecological and socially determined attributes that enable them to provide forage during critical time. Field survey indicated that animals and humans generally avoid hilly areas using them only when all other easily accessible rangeland is depleted of forage during droughts. Understanding the nature of KRAs will support identification, protection and restoration of critical forage hotspots for herbivores by strengthening rangeland inventory, monitoring, policy formulation, and conservation efforts to improve habitats and human welfare.

Pavanello S. and Levine S., September 2011. *Rules of the Range, Natural resources management in Kenya- Ethiopia border areas*. Humanitarian Policy Group Working Paper, Overseas Development Institute.

The report examines how pastoralists have managed their livestock herds by managing their rangelands and their mobility across those rangelands. This indigenous institutional framework of cross border rangeland management is always undermined by state institutions. The paper recommends a hybrid approach where state officials and customary authorities work together towards a shared development objective. The authors makes the following recommendations: to recognize the links between natural resources management, conflict and resilience; establish clarity on 'developing' pastoral areas; to recognize the cross border nature of pastoralism; develop a legal and policy framework; to consider rangeland management as an entry point; land tenure; involving customary land institutions; and in-depth understanding of cross border committees.

Solomon T. B., Snyman H. A. and Smit G. N. March 2007 *Cattle-rangeland management practices and perceptions of pastoralists towards rangeland degradation in the Borana zone of southern Ethiopia* Journal of Environmental Management Vol. 82 Issue 4, March 2007 Pages 481- 494

This research paper uses surveys to assess current livestock production systems, rangeland management practices and the perceptions of the pastoralists towards rangeland degradation. The

findings show livestock holdings, with the exception of camels, have shown a declining trend over time. The two most important traditional rangeland management strategies adopted by the pastoralists included burning and mobility, but since 1974/75 burning has no longer been practiced. With regard to mobility, the livestock herding falls in two categories, namely: home based and satellite herding. The increasing practice of crop cultivation on the rangelands was identified as a serious threat to future livestock production and traditional resource management practices. The authors provide suggestions for possible interventions to improve the productivity and sustainable use of these rangelands.

Tefera, S., et al., (2006), *Rangeland dynamics in southern Ethiopia: (1) Botanical composition of grasses and soil characteristics in relation to land-use and distance from....* Journal of Environmental Management doi:[10.1016/j.jenvman.2006.10.007](https://doi.org/10.1016/j.jenvman.2006.10.007)

The authors look at the distribution and compositional pattern of the grass layer, as well as soil quality of southern Ethiopian semi-arid rangelands. Their findings suggest that grazing intensity was higher in the communal land and moderate in the government ranch and in the traditional grazing reserves. They also found that the lack of significant differences in most of the studied (vegetation) variables along the distance gradient from water could be ascribed to the fact that grazing disturbance has already exceeded a certain threshold of degradation. The authors go on to recommend that under the present low states of soil nutrients and rainfall, cultivation is neither sustainable nor environmentally friendly and this will lead to further degradation of the soil in these marginal lands.

Tefera, S., et al., (2006), *Rangeland dynamics of southern Ethiopia: (2). Assessment of woody vegetation structure in relation to land use and distance from water in semi-arid....* Journal of Environmental Management doi:[10.1016/j.jenvman.2006.10.008](https://doi.org/10.1016/j.jenvman.2006.10.008)

This study investigated the advance of severe woody encroachment in the communal and government sites as well as along the distance gradient from water. Some of the important contributing factors that the authors found were heavy grazing pressure (in both the communal and government sites), expansion of cultivation and reduced mobility of livestock due to

settlement of the pastoralists in the communal land. The study found that there is a clear indication of the advancement of severe woody encroachment in the semi-arid Borana rangelands.

Tefera, S., et al., 2006. *Rangeland dynamics in southern Ethiopia: (3). Assessment of rangeland condition in relation to land-use and distance from water in semi-arid Borana....* Journal of Environmental Management doi:[10.1016/j.jenvman.2006.10.006](https://doi.org/10.1016/j.jenvman.2006.10.006)

The study assessed the condition of the semi-arid Borana rangeland in southern Ethiopia by studying different land-use systems and along a distance gradient from water sources. The authors discuss that despite the fact that the Borana rangeland is largely used by grazers, the importance of assessing more than the grass component e.g. woody plants and soil needs to be a primary concern in rangeland condition assessment. In the Borana rangelands the abundance of these encroaching woody species is more critical in aggravating deterioration in grassland productivity than other woody plant species. The authors suggest the priority of any bush control program must be towards minimizing the abundance of these woody plants.

2. Climate change impacts on the livestock herds of pastoralists

Bett B., Jost C., Allport R., and Mariner J., May 2009 *Using participatory epidemiological techniques to estimate the relative incidence and impact on livelihoods of livestock diseases amongst nomadic pastoralists in Turkana South District, Kenya.* Preventative Veterinary Medicine Vol. 90 Issue 3-4, 1 August 2009, Pages 194 -203

The study used participatory epidemiology to determine the relative incidence of livestock diseases and their impacts on livelihoods. 32 sub locations were used; focus groups and key informant interviews were conducted. The study shows that goats and sheep were perceived to be the most abundant livestock species while goats and camels contributed the most to the livelihoods of pastoralists. Livestock movements, limited access to veterinary services and stock theft were identified as key factors that contributed to the high prevalence and persistence of

diseases. This paper discusses strategies that could be used to control these diseases given the challenges associated with nomadic pastoralism and insecurity.

Butt B. 2009 *Seasonal space-time dynamics of cattle behavior and mobility among Maasai pastoralists in semi-arid Kenya* Vol.74 Issue 3 Journal of Arid Environments March 2010

The study is aiming to understand how seasonality in drylands influences the space time dynamics in cattle behavior and mobility among Maasai pastoralists in semi-arid Kenya. The author utilizes field based herd follows to document cattle behavior, global positioning systems (GPS) units that are handmade collars used to document patterns of cattle mobility and key informant interviews to investigate the role of pastoral herding strategies to explain these patterns. The differences in patterns of cattle mobility are explained by seasonal constraints on forage availability and that the high frequency of grazing/walking behavior during the dry season are related to cultural herding practices of the Maasai pastoralists. With future restrictions on mobility, tracking strategies that facilitate coping mechanisms in dry periods will weaken, exacerbating vulnerability to climate change , which will have a negative impact on the sustainability of pastoralism as a traditional livelihood system.

Gelagay A., Teshale S., Amsalu W. and Esayes G. July 2007 *Prevalence of contagious caprine pleuropneumonia in the Borana pastoral areas of Ethiopia* Small Ruminant Research Vol.70 Issue 2-3 July 2007 Pages 131-135

The study includes a retrospective study, fieldwork, serology, an abattoir investigation and isolation of the causative *Mycoplasma*. Outbreaks of contagious caprine pleuropneumonia (CCPP) were reported from almost all regions of the country, especially from lowland areas, which are known goat-rearing regions, with the highest in 2002. The causative agent (*Mycoplasma capricolum*) was isolated and identified from tissue samples and thoracic fluid treated bacteriologically. The study indicated that CCPP is becoming a very important goat disease in Borana pastoral areas.

McPeak John G., Barret C. B., 2001 *Differential Risk Exposure and Stochastic Poverty Traps Among East African Pastoralist*. *American Journal of Agricultural Economics* Vol. 83 No 3 Aug 2001

The authors investigate why climate change, price volatility, disease outbreaks and widespread violence causes suffering to recur despite significant humanitarian aid flows. They present a synthesis of findings from related studies that suggest how differences in pastoralists' ubiquitous risk exposure create and sustain structural poverty traps from which many arid and semi-arid land pastoralists are having a difficult time escaping. They report that in the short run the most essential principle is to support not undermine pastoralists' preferred means of managing risk; herd accumulation and mobility. In the long run pastoral development must be based on simultaneous improvement of market infrastructure and institutions.

Oba G., 2001. *The effect of multiple droughts on cattle in Obbu, Northern Kenya*. *Journal of Arid Environments* Volume: 49, Issue: 2, Pages: 375-386

Drought is the single most important environmental factor that causes cattle population fluctuations in northern Kenya. The researcher's monitor and compare the patterns of cattle mortality following multiple drought episodes and recovery. They compared effects of two droughts and three recovery periods on cattle population in Obbu, northern Kenya. The droughts altered herd structure and resulted in greater mortality among calves and breeding females than immature animals and mature male cattle.

Perry B., Grace D. and Sones K., May 2011. *Current Drivers and future directions of global livestock disease dynamics*. *Proceedings of the National Academy of Sciences* 10.1073/pnas.1012953108

The paper reviews the changing patterns of livestock disease over the last two decades, the authors discuss the drivers of these patterns and plot future trajectories of livestock disease risk in an effort to capitalize on the understanding of the recent past and provide a guide to the uncertain future. The authors look at various animal diseases and conclude that major proximate drivers of change in disease dynamics include ecosystem change, ecosystem incursion and movements of people and animals. They identify three main trajectories of global disease dynamics: the worried well in developed countries, the intensifying and market-oriented systems of many developing countries and the neglected cold spots in poor countries.

Pica- Ciamarra U., Nouala S., Sunae K. March 2011 *Livestock and Livelihoods in the IGAD Region: A Policy and Institutional Analysis* IGAD LPI Working Paper No. 01 – 11

This report addresses two major questions; what livestock sector policies and programs are currently in place in the IGAD region and what are the dominant development narratives that drive these policies and programs? , What are the expected and actual impacts on households' livelihoods of the dominant narratives driving the livestock sector policies and programs? The recommendations provided include ensuring that future policies, programs and projects will build on the many livelihoods provided by livestock, i.e. that livestock sector development will be inclusive and pro-poor, that they will be designed through an inclusive and participatory process that embraces dialogue and the use of evidence to address institutional dimensions.

Rufael T., Catley A., Bogale A., Sahle M., Shiferaw Y., January 2008 *Foot and mouth disease in the Borana pastoral system, southern Ethiopia and implications for livelihoods and international trade* Trop Anim Health Prod. 2008 Jan; 40(1): 29-38

The research paper uses participatory epidemiology to understand pastoralist's perceptions of the clinical and epidemiological features of foot and mouth disease (FMD) in cattle. Outbreaks of FMD peaked in Borana cattle during the two dry seasons and were attributed to increased cattle movement to dry season grazing areas. The endemic nature of FMD in Borana pastoral herds is discussed in terms of the direct household-level impact of the disease, and the increasing export of cattle and chilled beef from Ethiopia.

Thornton P. K., van de Steeg J., Notenbaert A., and Herrero M., 2009 *The impacts of climate change on livestock and livestock systems in developing countries: A review of what we know and what we need to know* Vol. 101 Issue 3 Agricultural Systems July 2009

The paper provides a brief overview of a classification of livestock systems, the literature on what is known concerning the impacts of climate change on livestock. Some of the livestock-related responses to climate change are also considered, in terms of possible researchable issues related to adapting to climate change and to mitigating the livestock-related impacts on climate change. The authors find that much more clarity is needed concerning the benefits of livestock,

the negative impacts they can have on greenhouse emissions and the environment, and the effects of climate change on livestock systems.

Van Den Bossche P., and Coetzer J. A. W., 2008. *Climate Change and Animal Health in Africa*. Revue Scientifique et technique International Office of Epizootics. Volume: 27 Issue: 2 Pages: 551-556

Climate change is expected to have direct and indirect impacts on African livestock. Direct impacts include increased ambient temperature, floods and droughts. Indirect impacts are the result of reduced availability of water and changes in the environment that promote the spread of contagious diseases. The distribution and prevalence of vector-borne diseases may be the most significant effect of climate change. The potential vulnerability of the livestock industry will depend on its ability to adapt to such changes. Developing an effective and sustainable animal health service, associated surveillance and emergency preparedness systems and sustainable disease control and prevention programs is perhaps the most important strategy for dealing with climate change in many African countries.

3. Climate change impacts on food security

Haile M., 2005. *Weather patterns, food security and humanitarian response in sub-Saharan Africa* [Philos Trans R Soc Lond B Biol Sci](#). 2005 Nov 29;360(1463):2169-82.

This research paper investigates how humanitarian responses can be improved by the understanding of climate variability, weather patterns and food security. The paper proposes new approaches for triggering humanitarian responses to weather induced food crises. It focuses mostly on the rural households in Sub Saharan African that depend on traditionally rain fed agriculture for their economic and social well being.

Humanitarian Policy Group April 2009 *Getting it Right, Understanding Livelihoods to Reduce the vulnerability of pastoral communities* Overseas Development Institute

The synthesis paper argues that the increasing vulnerability to food insecurity that pastoralists face stem from the failure to put the protection of pastoral livelihoods at the center of emergency preparedness, planning and response mechanisms. Insufficient and poorly designed state-led

investment in development initiatives, increasing climatic variability and public policy constraints combine to impoverish pastoralists. A livelihoods approach must be the critical base for designing an integrated approach that addresses vulnerability, as it improves the sensitivity of monitoring systems to hunger and impoverishment.

The 2010 Short Rains Season Assessment Report, Government of Kenya February 2011, Kenya Food Security Steering Community Group (KFSSG).

The report finds that the food security status of an estimated 2.4 million pastoralists, agropastoralists and marginal agricultural farm households is assessed to be unstable and requiring food and non-food interventions. Impacts of ‘traditional’ conflict in the northern pastoral districts and ‘new’ conflict in the northeastern pastoral, southern and coastal lowlands have also accentuated the impacts of the current drought. The authors give numerous priority interventions for different sectors such as livestock, market, food and water sectors.

FAO. 2011. *World Livestock 2011 - Livestock in food security*. Rome, FAO.

The report aims to fill the gap in research that examines the multiple roles played by livestock in food security of the poor. The report tells the story of livestock and food security from three perspectives: livestock and global food security, which describes the place of livestock products in human nutrition, the contribution of livestock to the world food supply and its stability. The second perspective looks at three human populations and three food security situations, and lastly feeding the future which examines the expected demand for livestock source food and the way the increased demand can be met with ever more limited resources. The main message the report conveys is that livestock make a positive contribution to food security but it suggests that livestock need to be managed carefully to avoid externalities.

4. Climate change impact on African pastoralists and their welfare

Admassie A., Adenew B., and Tadege A., 2008. *Perceptions of stakeholders on climate change and adaptations strategies in Ethiopia*. Ethiopian Economic Association and International Food Policy Research Institute (IFPRI) Research Brief, pages 2.

Three stakeholder discussion forums held in 2006 and were attended by representatives of the government, civil society, business sector, and local communities. The forums elicited

information to enable policymakers to make more informed decisions related to climate change adaptation. The forums complemented ongoing efforts to develop the National Adaptation Program of Action (NAPA), which is overseen by a steering committee representing government, nongovernment, academic, and research institutions. This brief is based on a paper that presents findings from the stakeholder discussion forums, as well as NAPA's technical working groups and workshops. These meetings explored stakeholders' perceptions of vulnerability to climate change and considered ways in which adaptation measures could be further integrated into Ethiopia's development process.

Angassa, A. and Beyene F. 2003. *Current range condition in southern Ethiopia in relation to traditional management strategies: The perceptions of Borana pastoralists*. Tropical Grasslands Volume 37, 53-59

The authors conducted a survey in Southern Ethiopia's grazing areas of Borana to analyze the pastoralists' traditional practices and strategies for sustainable resource use. Quantitative and qualitative data were collected by formal and informal interviews using a questionnaire and group discussion respectively. The authors reported that traditional grazing practices are becoming highly marginalized due to ranching, allocation of communal grazing areas to private investors, cultivation and privately reserved pasture areas. Traditional means of resource use and life support systems were declining despite the fact that most pastoralists showed interest in following traditional practices in range management. The authors suggest involving Borana pastoralists in decision making process for development, resulting in a more sustainable use of natural resource and a better future for pastoralists.

Blackwell PJ., 2010. *East Africa's Pastoralist Emergency: is climate change the straw that breaks the camel's back?* Third World Quarterly Volume: 31, Issue: 8

The global warming trend of climate change is having severe adverse effects on the livelihoods of the Turkana pastoralists of northwestern Kenya. This article examines the livelihood strategies of the Turkana and several poverty reduction programs currently established, while addressing the reality that traditional pastoralism may no longer be a viable livelihood option, given the effects of climate change, disease and the ensuing conflict over diminishing resources. The findings conclude that the future for traditional Turkana pastoralists is dismal because they continue to depend on an environment that may no longer support them. Humanitarians are

recommended to shift their focus to advocate and invest in alternative livelihood strategies that generate economic independence and help the Turkana adapt to their changing environment.

Block P. J., Strezepek K., Rosegrant M. W., and Diao X., 2008. *Impacts of Considering Climate Variability on Investment Decision in Ethiopia*. International Food Policy Research Institute Vol: 39, Issue: 2

The paper utilizes an agro-economic model, including mean climate variables, to assess irrigation and road construction investment strategies in comparison to a baseline scenario over a 12-year time horizon. The motivation for their work was to evaluate whether the inclusion of climate variability in the model had a significant effect on prospective investment strategies and the resulting country-wide economy. Nine sets of variable climate data are processed by the new model to produce an ensemble of potential economic prediction indicators. Analysis of gross domestic product and poverty rate reveal a significant overestimation of the country's future welfare by the mean climate model method, in comparison to probability density functions created from the variable climate ensemble which is, further utilized to demonstrate risk assessment capabilities. The addition of climate variability to the agro-economic model provides a framework, including realistic ranges of economic values, from which Ethiopian planners may make strategic decisions.

Boku, T. 2008. *Pastoralism under Stress: Resources, Institutions and Poverty among the Borana Oromo in Southern Ethiopia*. PhD Dissertation Department of International Environment and Development Studies, NORAGRIC Norwegian University of Life Sciences

The main objective of the study was to understand the manner in which external factors, such as government policy and the natural environment affect the pastoral resource base, how this in turn influences poverty and wealth and how customary institutions respond to these influences. Through mixed methods of data collection the author found that persistent and increasing poverty in Borana is attributed to impacts of state land use policies over different historical periods; incompatible conceptions of poverty and differently envisaged alleviation strategies by development planners and pastoralists, associated livestock loss etc. While some households lose capacity to attain food security and self reliance and thus drift into chronic poverty, others respond by diversifying livelihoods and herds.

Boku, T. and G. Oba 2009. *Policy-driven Inter-ethnic Conflicts in Southern Ethiopia*. Review of African Political Economy Volume 36, Issue: 121, Pg: 409-426

The article investigates the links between government administrative policies and inter-ethnic conflicts on grazing resource borders by discussing the historical relationships between contesting pastoral groups, (Borana and Somali clans) their perceptions of resource decentralization and referendum to claim ownership rights to grazing lands. The conflicts between the Borana and Somali clans are largely attributable to the politics of land control and the country's political program of ethnic –based federalism has brought dynamism into an old inter-ethnic conflict by giving it a new movement. The authors recommend an alternative policy option to be adopted that will seek ways and means of protecting pastoralists' customary land rights in a manner that promotes peace. They also suggest that there is need for urgent dialogue between the government and different pastoral communities for negotiating access to key resources supported by conflict resolution in the southern rangelands of Ethiopia.

Deressa T., Hassan R. M., and Ringler C., 2008. *Measuring Ethiopian Farmers' Vulnerability to Climate Change Across Regional States*. Food Policy, Issue: October, Publisher: International Food Policy Research Institute, Pages 32

This study analyzes the vulnerability of Ethiopian farmers to climate change based on the integrated vulnerability assessment approach using vulnerability indicators. The vulnerability indicators consist of the different socioeconomic and biophysical attributes of Ethiopia's seven agriculture-based regional states. The results indicate that the relatively least-developed, semiarid, and arid regions - namely, Afar and Somali, Oromia region and Tigray region- are highly vulnerable to climate change. Thus the authors recommend, investing in the development of the relatively underdeveloped regions, by utilizing irrigation for regions with high potential, early warning systems to help farmers better cope in times of drought, and production of drought-tolerant varieties of crops and species of livestock to aid in reducing the vulnerability of Ethiopian farmers to climate change.

Ericksen S., and Brown K.,(2011): *Sustainable adaptation to climate change, Climate and Development, 3:1, 3-6*, website accessed on Nov 2011
<http://dx.doi.org/10.3763/cdev.2010.0064>

The main theme the authors wish to highlight is how adaptations to climate change – in terms of the types of measures, policy frameworks and local household strategies – matters for future development, and particularly for social and environmental sustainability. The authors synthesize the discussion of sustainable adaptation by bringing together a collection of articles presented at the Human Security in an Era of Global Change Conference in June 2009. The articles explore some of the problems with such the assumption that adaptation is benign for development, and what directing adaptation towards principles of sustainability would mean in practice, as well as the conceptual and practical challenges inherent in trying to make adaptation sustainable.

Hesse C., and Cotula L. 2006. *Climate Change and pastoralist: Investing in People to respond to Adversity*. Sustainable Development Opinion, International Institute for Environment and Development. Website: <http://www.eldis.org/vfile/upload/1/document/0708/DOC23101.pdf> accessed: 11/23/2011

The opinion paper discusses the issue of how fluctuating climate has increased the pressure on pastoral resources leading to significant rise in destitution among pastoral groups in Africa. Tackling the climatic fluctuations requires enabling herd mobility while securing rights to natural resources; supporting pastoral livelihoods and their diversification; strengthening conflict management institutions and drought mitigation systems; and strengthening their capacity to participate in policy debates. As most pastoralists live in some of the poorest countries, national governments must be supported by richer countries, which bear the main responsibility for climate change.

Humanitarian Policy Group April 2009 *Pastoralism, policies and practice in the Horn and East Africa: A review of current trends* Overseas Development Institute

The synthesis paper reviews the current policies and practice towards pastoralism of governments, development agents and pastoral communities in the East and Horn of Africa. Some of the challenges mentioned in the paper that affect pastoral communities include increasing demand for land and breakdown of traditional governance structures. The main recommendation given by the author is to use policy to address the unique challenges of the

regions with the provision of resources and incentives for upward economic mobility for individual pastoralists.

Little P.D., Smith K., Cellarius B.A., Coppock L., Barret C., 2002. *Avoiding Disaster: Diversification and Risk Management among East African Herders*. Development and Change Vol. 32 Issue 3

This article addresses processes of livelihood diversification among pastoralists in the rangelands of northern Kenya and southern Ethiopia. By showing how comparative analyses in the region have been constrained by theoretical and data deficiencies, the article explores ways in which income diversification differs by what are termed conditional, opportunity, and local response variables. Climate, distance to market towns, gender, wealth, and education are attributes covered by these variables and discussed in the article. The conceptualization and case study provide useful bases for conducting comparative research on pastoral diversification in East Africa specifically and in sub-Saharan Africa generally.

Luseno W. K., McPeak J. G., Barret B. C. Little P. D., Getachew G. July 2002 *Assessing the Value of Climate Forecast Information for Pastoralists: Evidence from Southern Ethiopia and Northern Kenya* World Development, 31 (9), pp 1477 - 1494

Due to recent advances in climate forecasting technologies several donors and governments are interested in the use of technologies as a way to help not only indirectly, as an input into top-down early warning systems, but also directly, as a basis for improving choice under uncertainty. The authors report finding that most pastoralists rely heavily on indigenous forecasting methods as a way to predict seasonal climate change as compared to external climate forecasts. They conclude that the information most likely of value to people who generally migrate would be real time, spatially explicit weather and forage condition reporting (e.g., through finer resolution maps of recent rainfall and current range conditions), not long-lead forecasts.

Nassaf M., Anderson S. and Hesse C. April 2009 *Pastoralism and climate change Enabling adaptive capacity* Humanitarian Policy Group, Overseas Development Institute

This synthesis paper talks about the drylands that make significant contributions to national economies and support millions of people. They are also areas of great untapped potential, and can play an important role in supplying an increasing demand for livestock. Despite these opportunities the drylands in the region receive little investment and continue to be marred by poverty, food insecurity and conflict. The climate of the Horn and East Africa is becoming more variable and less predictable, and trends towards future changes are emerging. In order to appropriately inform policy, it is imperative to better understand what the ranges of likely effects are going to be in different locations. Evidence suggests it would be more effective – including cost effective – to enable and strengthen the inherent adaptive capacity of pastoralists, and find ways to encourage their autonomous adaptation, than to provide adaptation strategies for them.

Orindi V. A., Nyong A., and Herrero M., 2008 *Pastoral Livelihood Adaptation to Drought and Institutional Intervention in Kenya* Human Development Report Office

This paper examines how can pastoral systems adapt to future drought occurrences in Kenya? Both the Maasai and Turkana pastoralists are particularly vulnerable to the frequent droughts that characterize the ASALs. It is important that a comprehensive drought contingency plan be developed to reduce vulnerability in the drylands, particularly among the pastoralists. The plan would coordinate the use of natural resources among all potential users and minimize the conflicts that have become so common between pastoralists and crop farmers in the region. There should also be a drought-coordinating agency to ensure consistency, communication, coordination and responsibility within government and between other agencies and reduce the number of inappropriate piecemeal initiatives.

Ouma R., Mude A., and Van De Steeg J., April 2011. *Dealing with Climate-Related Risks: Some Pioneering Ideas for Enhanced Pastoral Risk Management in Africa*. Experimental Agriculture (2011), volume 47 (2), pp. 375–393 C _ Cambridge University Press 2011 doi: 10.1017/S0014479710000888

The paper examines results from studies on the perceptions of pastoralist communities, on the effectiveness of current climate related risk management strategies. The authors present some

innovative initiatives that offer a clear departure from traditional approaches; they use recent data from studies in Kenya and southern Ethiopia to confirm that traditional pastoral risk management approaches are increasingly futile against increasing external pressures, seasonal rainfall and future climate change. The authors specifically look at pilot studies designed to demonstrate the efficacy of index based risk transfer products in pastoral systems improvements, in the management of food insecurity response for pastoralists and the recasting of development interventions as risk management.

Owuor B., Mauta W., Eriksen S., 2011. *Sustainable adaptation and human security: Interactions between pastoral and agropastoral groups in dryland Kenya*. Climate and Development Vol 3, Iss 1, 2011.

This article examines how pastoral and agropastoral populations interact in adapting to climate variability and change, especially drought. The authors conducted qualitative interviews between 2004 and 2007 in Endau, eastern Kenya, and the data was used to explore the role of interactions within trade, livestock and human mobility, and accessing forest resources in sustainable adaptation and how they have been affected by formal policies and informal governance. They conclude that both official policy and state practice in terms of actual decision making (whether in line with policy and legal frameworks or not) appear to undermine human security in terms of political and social rights, as well as sustainable adaptation in terms of social equity and environmental integrity.

Oxfam *Oxfam Survival of the Fittest: Pastoralism and Climate Change in East Africa* August 2008

To address the challenges the paper suggests that pastoralist communities need more investment in good basic services such as health care and education, flood-proof transport and communication links, financial and technical support services etc. Those governments must support the activities that pastoralists themselves are already undertaking in order to deal with climate variability and climate change, civil societies and local communities also need support to build strong and representative pastoral organizations. It also reports that adaptation to climate change should involve the movement of some people out of pastoralism and into other

livelihoods to alleviate the growing population pressure on the land, as well as to increase the range of cash sources available to pastoralist families.

Robinson Lance W., Berkes F., April 2010. *Applying Resilience Thinking to Questions of Policy for Pastoralist Systems: Lessons from the Gabra of Northern Kenya* Hum Ecol (2010) 38:335–350

The paper explores the potential value of resilience thinking to the development of an analytical framework—which allows for an understanding of pastoralist systems and their resilience before the occurrence of effects that catastrophically demonstrate system vulnerability. The researcher conclude that suggesting alternative lifestyles that are very different from traditional pastoralism is not ideal and what needs to be done instead is asses alternatives that support traditional pastoralism instead of encourage alternative livelihoods.

Simmel J O., 2008. *The threat posed by climate change to pastoralists in Africa*. Indigenous Affairs International Work Group for Indigenous Affairs Vol:27, Issue: 1-2/08, Pages: 34-43

This paper describes how pastoralist communities in Africa are affected by climate change, the coping strategies they employ, and the policy framework that is needed to address the adverse effects of climate change on pastoralists. Some of the key areas of policy intervention include securing rights to critical resources (such as dry-season pastures and water), strengthening the capacity of pastoral groups to engage in debates on policy issues, and supporting pastoralist communities' own initiatives on climate change mitigation and adaptation.

Waruru M. July 2010 *Pastoralists: Coping with climate change New Agriculturalists*
<http://www.new-ag.info/focus/focusItem.php?a=1669> (accessed 03/01/2011)

The article talks about the change in climate and the impact it is having on the survival of pastoralist communities. A lot of factors have forced a lot of pastoralists to seek alternative lifestyles such charcoal burning, logging to survive and sedentary lifestyles in urban areas that increases poverty. The author suggests the use of new technology as way of sharing marketing information as well as sharing information on pasture availability. The author concludes by quoting several experts at a conference of pastoralism and climate change adaptation where they

encourage policy makers to inject more efforts into devising adaptive strategies to help pastoralists survive climate change and to create an enabling environment to help pastoralist to solve their own problems.

5. Climate Change Impact on Livestock Markets

Aklilu Y. and Catley A. April 2011 *Shifting Sands: The Commercialization of Camels in Mid-altitude Ethiopia and Beyond* Feinstein International Center

The report describes an extensive and growing camel trade system from Eastern Ethiopia into Sudan. It uses a five week field study that followed the camel trade route from its origins in pastoralist areas, through the movement of camels into Sudan; it describes the trade route and markets and also the changing attitudes of mid-altitude farmers towards the ownership and use of camels.

Behnke R., 2006 *Review of the literature on Pastoral Economics and Marketing: The Horn of Africa and Southern Africa* World Initiative for Sustainable Pastoralism, IUCN EARO

This report looks at livestock marketing and commercial involvement in certain countries in the Horn of Africa and Southern Africa. In the Horn, pastoralism generates impressive amounts of foreign exchange and a significant contribution to GDP. Despite constraints, pastoral households in Ethiopia and Somalia are increasingly involved in commercial livestock production for sale, with results that in the aggregate are impressive both in terms of the volume and value of international trade and foreign exchange earnings. Despite their remoteness and their participation in weak national economies, these are pastoral production systems oriented to commercial production.

Cagnolati V., Tempia S. and Abdi A. M., 2006 *Economic Impact of Rift Valley Fever on the Somali Livestock Industry and a novel surveillance approach in nomadic pastoral systems*

To establish risks associated with the export of live animals, an epidemiological survey was conducted in Somaliland in 2001 to map Rift Valley Fever (RVF) antibody distribution in 300 randomly selected locations, and identify RVF related signs in animals and humans. After the

collapse of the Somali state in 1991, the livestock sector suffered from prolonged civil strife and drought, but enjoyed an impressive comeback. While direct livestock losses due to RVF were perceived as insignificant or nonexistent by livestock producers and other Somali stakeholders, the export bans continue to negatively impact pastoralists' income due to the reduced number and value of exported animals.

Desta S., Berhanu W., Sebsibe A., and GuerneBleich E. July 2011 *Regional Initiative in Support of Vulnerable Pastoralists and Agro- Pastoralists in the Horn of Africa: Assessment of Cross Border Informal Livestock Trade in Somali Region*. Food and Agriculture Organization of the United Nations

The authors present findings on assessment of the Informal cross border trade (ICBT) which involves in and out-flows of agricultural products including livestock, and manufactured goods and food supplies between the region and Somaliland. ICBLT has been shown to be much more important than formal livestock export trade, and is a fundamental source of livelihood and food security in the Somali region and beyond. Informal cross border livestock trade, in particular, the unofficial one is considered illicit by the government. Government interference and restrictions usually accelerate food insecurity and more dependence on relief handouts in the regional state. The authors give various recommendations including that the government give more protection and attention to the inhabitants in the region and provide alternative markets for both livestock and other supplies.

Negassa A., Costagli R., Matete G, Jabbar M, Oyieke S. O., Abdulle M. H., and Omore A. April 2008 *Towards Improving Livestock Export Marketing Support Services in the Somali Context: Survey Findings and Implications*. Discussion Paper no.13 Improving Livestock Market Opportunities, International Livestock Research Institute

The information provided facilitates the development of effective and efficient support services, provided by accountable and competent rural institutions. Some of the main actions recommended include: Provision of market information services to collect and disseminate information on export and domestic markets, Development of a system of certifications for

health and quality assurance, Provision of short term training to traders, Empowering livestock traders through strengthening trade associations, Organize regular trade missions to Middle East markets etc. The main drawback of the study was that it focused on the supply side issues within Somalia and didn't include information on the demand side in the importing countries.

Pavanello S, July 2010 *Livestock Marketing in Kenya- Ethiopia border areas: A baseline study*. Humanitarian Policy Group Working Paper, Overseas Development Institute.

The paper identifies important issues in livestock marketing in the Kenya- Ethiopia border and aims to provide potential entry points for action to improve livestock marketing in the region. The main trigger to sell livestock is no longer profit making but financial need for pastoralists and climatic and environmental conditions. The author identifies the main constraints to livestock marketing which include: poor road conditions and long trekking distances to markets, livestock infrastructure etc. Some of the recommended actions provided by the author include: investigating the potential and relevance of livestock market development, facilitate links with traders' cooperatives, strengthen producers bargaining power, harmonizing market information collection efforts and improving understanding of cross border trade.

Thendiu I. N., November 2009 *The role of livestock marketing in improving the Pastoralists' Livelihoods through income generation: The case of the pastoralist communities of Garissa District Kenya*. University of Nairobi, Faculty of Arts, Department of Sociology and Social Work Reg. No. C50/8617/03

The author examines how the livelihoods of pastoralist communities living in arid and semi-arid lands (ASALs) in Garissa District, can be improved through an efficient livestock marketing system. The study conducted surveys with livestock keepers, traders and key informants. The findings indicated the main constraints that impeded livestock marketing, suggestions on how to deal with those constraints and key stakeholders in livestock marketing and their roles. The main conclusion from the study were: that livestock keeping is very important, there are many benefits to local pastoralists derived from livestock enterprise and that livestock marketing can play a leading role in poverty alleviation in ASALs if the identified constraints are addressed.

Other related articles that were not annotated can be found at:

WWF, Climate Change Impacts on East Africa A review of the Scientific Literature

<http://www.wwf.dk/dk/Service/Bibliotek/Klima/Rapporter+mv./Climate+change+impacts+on+east+africa.pdf>

These links are mostly related to food security:

<http://ochaonline.un.org/Advocacy/Pastoralism/tabid/5726/language/en-US/Default.aspx>

<http://www.fao.org/ag/AGP/AGPC/doc/PUBLICAT/Pub2/P22.htm>

http://www.oxfam.org.uk/resources/learning/pastoralism/downloads/food_security_ethiopia.pdf

<http://www.pastoral-food-security.blogspot.com/>

http://www.fews.net/docs/Publications/Djibouti%20Alert%20Jan_2010_final.pdf

http://www.fews.net/docs/Publications/Kenya_OL_2011_01_final.pdf

<http://www.irinnews.org/report.aspx?reportid=51335>

<http://www.eafricanfocus.com/2010/02/23/experts-voice-food-security-concerns>

These links mainly are related to livestock markets:

<http://ageconsearch.umn.edu/bitstream/51624/2/Livestock%20price%20formation%20june2709.pdf>

<http://mahider.ilri.org/handle/10568/935>

http://www.oxfam.org.uk/resources/countries/wafrica_pastoralism.html

http://www.fews.net/docs/Publications/east_Cross%20border_2010_10_final.pdf

Part II: Based on Literature and Archival work in Ethiopia

Annotations by Dejene Negassa, Ph.D., Independent Researcher

- 1. Impact of a commercial destocking relief intervention in Moyale district, southern Ethiopia.** Dawit Abebe, Adrian Cullis, Andy Catley, Yacob Aklilu, Gedlu Mekonnen and Yodit Ghebrechirstos. **Overseas Development Institute, 2008**

The study stresses destocking as the most effective external drought intervention. Dawit et al (2007) argue that the destocking relief intervention of early 2006 drought in Moyale district was a viable and useful drought intervention. The authors in this article recognize destocking as the most important intervention strategy.

- 2. The Importance of Pastoralists' Indigenous Coping Strategies for Planning Drought Management in the Arid Zone of Kenya**

Gufu Oba. **Nomadic Peoples NS (2001) Volume 5 Issue 1, pp. 89-119**

Based on his study of the arid areas of northern Kenya which consists groups such as the Borana, the Gabra, the Rendille, the Ariaal, the Sakuye, the Samburu, and the Turkana, Oba (2001) remarks that development programs can alleviate the problems of food insecurity by reviving indigenous means of drought coping mechanisms. The increasingly worsening condition of food security in pastoral areas partly has to do with the lack of a clear understanding of indigenous coping strategies.

- 3. Pastoralists' Conceptions of Poverty: An Analysis of Traditional and Conventional Indicators from Borana, Ethiopia**

BOKU TACHE and ESPEN SJAASTAD

World Development Vol. 38, No. 8, pp. 1168–1178

In order to address local problems, including poverty and environmental degradation, it is important to understand cultural perceptions within which projects take place. Tache and Sjaastad (2010) show the gap between standard development approaches and local perceptions of poverty among the Borana. The authors discuss various problems associated with attempts to measure poverty, from those focusing on income and

expenditure to “poor health, human rights, dependency, vulnerability” (p. 1168), as confusing and tautological.

4. The Forming of Town in Pastoral Society and its Meaning: The case of Borana in South Ethiopia

Chikage Oba in Proceedings of the 16th International Conference of Ethiopian Studies Volume 2, Edited by Svein Ege, Harald Aspen, Birhanu Teferra and Shiferaw Bekele. Department of Social Anthropology, Norwegian University of Science and Technology, Trondheim, 2009

Oba (2009) describes the process by which the Borana people have settled in urban centers and discusses the meaning of urbanization for the Borana people. According to Oba, the initial settlement was set off by the non-Borana settlers in the 1940s and then by the Borana themselves more recently, especially since 1992. Earlier, only a few herd-less Borana households lived in the then emerging towns and this trend continued until today. The latter period was significant as it showed tremendous expansion in schools and markets in the area, including in small settlements.

5. Examining the Potential of Indigenous Institutions for Development: A Perspective from Borana. E.E. Watson. *Development and Change* 34(2): 287-309

Today, development theorists and practitioners view indigenous institutions as important tools for achieving development goals (Watson, 2003). The article examines the nature of Borana indigenous institutions and their potential for development. According to Watson, “indigenous institutions include organizations, conventional knowledge, ‘regularized practices,’ customary rules, and practices...” (p. 289).

Borana institutions sometimes privilege females such as pregnant women. For example, during the watering of animals, “pregnant women are... given privileged water rights...” (p. 294).

6. The Effect of Environmental Variability on Livestock and Land-use Management: The Borana Plateau, Southern Ethiopia. Socioeconomics and Policy Research Working Paper 35.

N. McCarthy, A. Kamara and M. Kirk. 2002.

The authors critique the government sponsored privatization process that is often driven by externally financed projects such as borehole and ranches. They argue that privatization of the commons in dry areas is not an efficient development pathway as environmental risk is a driving factor in land use and livestock productivity. The article assesses the factors driving changes in the Borana rangelands of southern Ethiopia.

**MIND THE GAP: *Commercialization, Livelihoods and Wealth Disparity in Pastoralist Areas of Ethiopia*, Feinstein International Center and DFID. Yacob Aklilu and Andy Catley
December 2010**

This article focuses on the Borana zone and Somali Region of Ethiopia which are considered a “high export areas.” While Somali region has a long history of export trade, “More recently, and with government support to formal meat exports, Borana pastoralist areas have been supplying increasing numbers of livestock to export abattoirs” (p. 1). The authors raise the question of who benefits from these trends, and argue that the wealthy pastoralists are beneficiaries of the increasing commercialization of the pastoral economy.

7. Foot and mouth disease in the Borana pastoral system, southern Ethiopia and implications for livelihoods and international trade.

**T. Rufael & A. Catley & A. Bogale & M. Sahle & Y. Shiferaw
Trop Anim Health Prod (2008) 40:29–38**

The paper discusses the challenges posed by FMD to livelihoods and international trade in the Borana pastoral system. FMD is believed to cause low milk supply, mortality in calves, and heat intolerance. However, there is limited information available on FMD (or other diseases) due to weak veterinary services in Borana areas, and this hinders international trade. For example, Egypt, a major importer of cattle from Ethiopia, “in mid 2007, imposed a ban on live cattle and chilled carcass imports due to outbreaks of FMD in Egypt presumed to be associated with Ethiopian imports” (p. 36).

8. Is Poverty Driving Borana Herders in Southern Ethiopia to Crop Cultivation?

Boku Tache & Gufu Oba. *Human Ecol* (2010) 38:639–649

Boku and Oba (2010) argue that even though cultivation is a coping strategy for poor and destitute households among the Borana pastoral group, poverty alone is not a motivating factor for cultivation. They test whether or not poverty is the main driver of crop cultivation by pastoral households, using proxy variables such as wealth and cropland sizes and conclude that factors such as shortage of labor, lack of sufficient traction animals, and unreliable rainfall also need to be considered.

9. Market Institutions and Transaction Costs Influencing Trader Performance in Live Animal Marketing in Rural Ethiopian Markets. Mohammad Jabbar, Samuel Benin, Eleni Gabre-Madhin, and Zeleka Paulos. *JOURNAL OF AFRICAN ECONOMIES*, VOLUME 17, NUMBER 5, PP. 747–764

The paper deals with trader performance in the highland Ethiopian non-pastoral markets. The authors explore about “...how market actors at different layers gather and exchange information, interact, negotiate and effect transactions, settle disputes, how costly and effective the transactions are, how effectively consumer prices are transmitted to producers and who benefits how much from market transactions, what kind of organisational and institutional arrangements support or hinder these transactions” (p. 749). The main problems identified by the traders include unstable price, weak demand for the type of animal traded or low quality of the product, multiple taxes, non-transparent taxation system, and limited access to credit.

10. Emerging responses to climate change in pastoral systems. Yohannes GebreMichael; Wolfgang Bayer & Ann Waters-Bayer. *Rural Development News* 2/2010

This paper highlights the difficulties under which the pastoral system operates and the coping mechanisms pastoralists have developed over many years. In many sub-Saharan countries, it is predicted that many crop growing farmers will diversify their agricultural activities, i.e., will engage more in livestock keeping. However, inappropriate interventions and marginalization of the pastoral system made it less resilient in the face of climate uncertainty.

11. Borana-Oromo Community Conserved Landscapes, Ethiopia

Project no: 028827 Project acronym: GEM-CON-BIO Project title: Governance and Ecosystems Management for the CONservation of BIOdiversity **GEM-CON-BIO Case Study Report CENESTA**. Marco Bassi and Boku Tache, July 2007

This report gives detailed information about the Borana zone land-use system. The total land area currently occupied by the Borana in Ethiopia is 45,620 Km² and consists of 14% dry grasslands and 70% sparsely wooded grasslands as well as 12% regularly or recently cultivated agricultural, horticultural and domestic habitats (Bassi and Tache, 2007). The rest is occupied by wooded land and Constructed, industrial and other artificial habitats (ibid). The authors identified population growth as the result of immigration, inappropriate development policies, and agricultural encroachment in grazing land as the major external drivers impacting the management of ecosystems in the area.

12. Ayele Solomon, Assegid Workalemahu, Jabbar M.A., Ahmed M.M. and Belachew Hurissa. 2003. Livestock marketing in Ethiopia: A review of structure, performance and development initiatives. Socio-economics and Policy Research Working Paper 52. ILRI (International Livestock Research Institute), Nairobi, Kenya. 35 pp.

In this paper, the authors stress the importance of the income generated from livestock sale both to pastoral and non-pastoral communities in Ethiopia. For example, the contribution of livestock sale to household economy ranges from 37-87% in different parts of the country. However, in recent years, the Middle-east countries, which have been a traditional export market for Ethiopian animals, have increasingly adopted stringent health and quality control regulations. This export ban has several consequences for the household economy, especially in pastoral areas.

13. “Review of dairy marketing and processing in a semi-arid pastoral system in Ethiopia” in D.L. Coppock¹, S. J. Holden², and Mulugeta Assefa, Dairy marketing in sub-Saharan Africa Proceedings of a symposium held at ILCA, Addis Ababa Ethiopia, 26--30 November 1990, Edited by Ray F. Brokken and Senait Seyoum

International Livestock Centre for Africa, Addis Ababa, Ethiopia

The document is a collection of symposium papers intended to understand dairy marketing in sub-Saharan Africa. The paper by Coppock et al deals with dairy processing and marketing among the Borana in southern Ethiopia. The authors describe seasonal milk production and allocation of marketed surplus of dairy products, incidence of calf morbidity and mortality and human consumption of dairy products and grain. Dairying was controlled by women. Wealthy families close to markets sold the largest amounts of fresh milk and butter, even though dairy income was relatively more important for the poor, who used the money to purchase grain.

14. Tari Doti. 2010. “Climate variability, pastoralists’ vulnerability and options: The case of the Borana of Northern Kenya.” In *Climate Change and Natural Resources Conflicts in Africa*. Edited by Donald Anthony Mwiturubani and Jo-Ansie van Wyk, Institute for Security Studies. Monograph 170.

The Borana pastoralists, like many others, are vulnerable to the challenges of climate variability. In order to mitigate the effects of climate hazards, such as droughts, the Borana depend on traditional coping mechanisms such as “mobility and/or migration, communal land ownership, large and diverse herds, herd separation and splitting, informal social security systems, forming economic alliances with non-pastoral communities, and engaging in non-pastoralist activities like farming and charcoal burning” (p. 190). However, these mechanisms have become inadequate in the face of deteriorating climatic conditions as well as other social and security factors.

15. Rally of the Borana, Guji, Gebra, Arsi and Marian Pastoral Clans of Oromiya Report, PASTORALIST FORUM ETHIOPIA June 2004, Addis Ababa

The report deals with the Borana, Guji, Gebra, Arsi and Marian Pastoral Clans in the Oromia Regional State. The objective of the gathering was to discuss and to frame pastoral problems each ethnic group might have and to consolidate and present these problems in the form of resolutions. Pastoral Communication Initiative (PCI) in collaboration with the Borana Zonal Administration, and Pastoralist Forum Ethiopia sponsored the meeting. Each clan members identified the major problems that are facing their communities. For the Borana, the expanding agriculture, the sale of water and grass, and the declining prerogatives of ellas, were identified as

some of the major problems. One of the solutions proposed regarding droughts suggests selling unproductive animals before droughts and raiders claim them, and put the proceeds in the bank.

16. Climate-related vulnerability and adaptive-capacity in Ethiopia's Borana and Somali communities Final assessment report. **Béatrice Riché (IISD), Excellent Hachileka (IUCN) Cynthia B. Awuor (CARE International), Anne Hammill (IISD)**
August, 2009

The report deals with the impact of climate change, especially increasing temperatures and drought frequency, on the Borana and Somali communities of Ethiopia. It mainly focuses on people's coping strategies that are embedded in their social structures and resource management systems, but have increasingly become ineffective in the face of changing climatic conditions. It also presents ideas generated by the communities on how to prepare for future climate change.