Centre Commissioned External Review (CCER) of Pastoral Systems

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REPORT SUMMARY

This report reviews key issues in pastoral systems research in tropical areas of sub-Saharan Africa and South Asia with the goal of identifying a ten-year research strategy for pastoral systems research for ILRI. It summarizes current work (ILRI and non-ILRI) on topics related to pastoral systems and identifies a focused set of recommendations for ILRI where the institute has a comparative advantage relative to the numerous other organizations conducting research on pastoralism; a proven or potential 'track record;' important set of productive partnerships (current or planned); and/or the existing or potential capacity to contribute to important pastoral systems research and policy in the future.

The key recommendations from the report are as follows:

Ten Year Research Strategy for ILRI

The report identifies four areas of pastoral systems research that should be part of an ILRI ten-year strategy. Each of these research areas requires an interdisciplinary approach and espouses a participatory research model that involves pastoralists in identifying priorities and the policy implications of the research. They are presented separately even though there are significant areas of overlap and potential synergism among them. The four recommended themes are:

Pastoral Livestock Production: animal species and breeds important to pastoralist production

ILRI's experiences in animal production and breeding, especially in Africa, provide them with unparalleled opportunity to be intellectual leaders in the improvement of pastoral animal productivity. The work can highlight the role of certain breeds in different pastoralist production systems and market channels.

Pastoral Rangeland Ecosystems

ILRI should pursue ecological research that is closely tied to the objectives of increasing livestock productivity and reducing pastoralist vulnerability to hunger and poverty, while improving livelihoods. It should continue its work on environmental services in rangeland ecosystems with the goal of enhancing environmental sustainability and incomes and livelihoods of pastoralists.

Understanding Different Pastoralist Market (Value) Chains

ILRI has an important opportunity to address innovations in new market chains in pastoral areas, with a focus on how poor pastoralists and women can access these different lvalue chains. Specific issues to study are: (1) Trade in high-demand, livestock breed preferences ('brands') and its economic and social benefits and costs; (2) Domestic markets and new trade pathways; (3) Regional export/cross-border trade; and (4) Pastoralist dairy trade.

Innovations in vulnerability reduction

A research and development program on this topic calls for increased inter-disciplinarity and thematic coverage beyond vulnerability to poverty and asset/herd loss. In addition to poverty/asset vulnerability, ILRI should address pastoralist vulnerability to: (1) Climate variability and change and (2) animal disease/emerging zoonoses.

Additional Resources Required

The review recommends that additional expertise be recruited in non-economics social science (ecological or economic anthropology) and rangeland ecology. It also points to the need for new kinds of partnerships with NGOs and public national and regional organizations; ILRI to serve as a 'knowledge broker' on pastoral systems; and training and capacity building activities for government institutions and other development partners.

Proposals for Mobilizing Resources

There are several opportunities for proposal development and fund raising to implement a research strategy on pastoral systems. Three proposals for mobilizing funds for a pastoral systems program are summarized in the report and cover topics, such as climate change adaptations, pastoralist vulnerability, innovations for addressing relief-to-development issues, and interregional comparisons that add research emphases and sites in West Africa and southern Africa.

The Next Three Steps for ILRI

The following are three immediate actions that can assist ILRI's pastoral systems research strategy. These include:

(1) Formation of a *Pastoral Research Task Team (PRTT)* that would create a platform at ILRI where researchers on pastoral systems can share ideas, develop proposals, and discuss development applications;

(2) *Integrative and synthesis work* on existing and recently completed projects that integrates work being done at different scales; addresses common methods already being undertaken; and identifies similar lessons and research findings related to pastoral systems;

(3) ILRI should *develop 1-2 interdisciplinary proposals* on one or more of the four recommended research themes on pastoralism.

1. INTRODUCTION

This report is written in response to a request by ILRI "to undertake a review of pastoral systems research for development that will guide the development of a relevant and focused agenda on pastoral systems for the institute and its key partners (including the context of the evolving CGIAR) (ILRI 2010)." It is meant to focus on nomadic pastoral and transhumance systems in tropical parts of Africa and South Asia, including semi-settled systems where there is a fixed residence but livestock remain mobile through herd camps or other organizational forms. The pastoral modality of fixed base residence and mobile herd camps is increasingly the norm in pastoral regions, while fully nomadic pastoralism (systems where the entire family moves with the herds periodically during the year) is declining in importance.

With the exception of a few regions of India, including Rajasthan, the bulk of the materials for the report are drawn from sub-Saharan Africa, particularly eastern and West Africa. A key challenge for this review has been to limit recommendations for ILRI to a limited set where the institute has a comparative advantage, a proven or potential 'track record,' important set of productive partnerships, and/or the existing or potential capacity to contribute to important pastoralist systems research issues and policy in the future. Thus, the review tries to consider ILRI's existing strengths in pastoralist-related research and development, including areas where it can contribute to larger debates about pastoralism and to key policy discussions. At present all five of ILRI's thematic departments are involved in some aspect of research related to pastoral systems (either directly or indirectly).

What also is important is to differentiate those research and development activities related to pastoralism where ILRI can either (1) lead in defining research programs and their implementation; (2) be equal partners in research programs with other partner organizations;

and/or (3) serve mainly a facilitating and coordinating role where participation in research design and implementation is limited. All of these roles can be potentially important for ILRI's capacity as an international research center, but ILRI needs to achieve a better balance between activities on pastoralism where it is clearly the lead organization shaping the research activity from less prominent roles where it is merely facilitating, coordinating, and/or partnering with others who are leading the research agenda. The lack of a coherent research program on pastoralism partly is to blame for the fact that ILRI mainly has played the role of 'responder' to other organization's and researchers' programs, rather than an initiator of its own research programs on pastoral systems. Part of the problem is two-fold: (1) since 2000 ILRI has lost several key research staff in areas related to pastoralism, which has contributed to the institution's fragmented approach to pastoral systems research and development; and (2) pastoral systems research has not been a priority at ILRI until recently. The People, Livestock, and Environment (PLE) unit has recognized this and has begun to make strategic hires and to define pastoral systems research around the concept of 'vulnerability' (see ILRI 2009).

In terms of the review's approach or methodology, information was obtained from: (1) existing ILRI proposals, reports, and publications dating back to 2000; (2) one-week site visit to ILRI's headquarters (Nairobi, Kenya) in late October-early November where the authors met with several ILRI staff members and members of a select number of ILRI partner organizations, as well as presented preliminary findings at an ILRI Board meeting (see Appendix B); (3) Skype call interviews with ILRI staff in West Africa and with a collaborating researcher in England; (4) a short site visit by the panel chair and co-author (Little) to ILRI's campus in Addis Ababa, Ethiopia in August where meetings were held with the director of the People, Livestock and Environment (PLE) theme; and (5) the authors own previous research and policy work on

pastoralism. As part of the exercise, ILRI staff members drafted three separate papers on: (1) the current status of pastoral systems in tropical sub Saharan Africa and South Asia; (2) current interventions targeted at pastoral systems in tropical sub-Saharan Africa and south Asia; and (3) inventory of ILRI research and publications on pastoral systems since 2000. These papers proved helpful to the team by highlighting ILRI's current ideas about pastoral systems research, its existing projects and those of other organizations, and its record of publications and other research outputs since 2000.

The report is divided into four sections, including the introduction. In the remainder of this section we discuss the review's methodology and schedule. In part (2) the current trends, context of and challenges for pastoralism are summarized with the goal of identifying characteristics of successful pastoral systems. Section (3) presents ILRI's existing roles and contributions to different themes of pastoral systems. In this section, the key partner organizations that have collaborated with ILRI are discussed and the ways that they might figure in future ILRI activities. Based on the team's work and discussions with ILRI staff the concluding section (4) recommends four areas of research and development that ILRI should focus in the future, highlighting their relationship to the new CRPs (CGIAR Research Programmes) of the CG consortium; potential partnerships; three actions that can be taken immediately; and possible sources of funds to support these initiatives.

2. CONTEXT AND CHALLENGES

The paper acknowledges several realities of pastoralism that are integral to an ILRI research strategy. These include:

- **Mobility:** Pastoralist reliance on mobility as a key risk management strategy that will continue to be important in large parts of the drylands of sub-Saharan Africa and South Asia.
- **Livestock-based foods:** Livestock production and the products it produces (especially live animals, meat, and dairy products) will remain key characteristics of pastoral systems, as will the ecological (land/water), social, and economic basis that underlie this production.
- **Economic and Environmental Contributions:** Pastoralism will continue to make significant economic and environmental contributions at regional, national, and even international levels.
- **Beyond Relief:** Although pastoralism increasingly is associated with relief/humanitarian aid and poverty, it is important to look beyond the relief images to promote positive development, economic, and eco-system aspects. There is a need for evidence-based studies to counter deeply-entrenched associations of pastoralism with poverty and relief efforts rather than long-term development.
- **Diversification:** Diversification is a valuable risk management strategy for pastoralists, but will continue to be a supplement rather than a replacement for pastoralism.
- **Dynamism:** Pastoral systems are very dynamic and continually adapting to new challenges and opportunities. In many remote pastoralist regions, the rate of change will continue to be slow but in key resource zones, such as river basins, change will be rapid and the pressures by government and others to initiate alternative uses will challenge the capacity of pastoral systems to adapt.

In short, pastoral systems contribute much to national economies and regional ecosystems and they will continue to do so for at least the foreseeable future (15-20 years). The imminent demise of pastoralism worldwide has been predicted since at least the early 1900s and this prediction still appears in some official reports and popular accounts (see Spear and Waller 1993: IRIN 2006). However, pastoralism still remains a dominant activity on approximately 50 percent of Africa's land and on large parts of south Asia's arid lands. Speculations about its future sparked considerable interest, books, and conferences among researchers and practitioners in the 1970s and 1980s (Monod 1975; Galaty et al. 1981) and continues to do so today (PCI 2007; IDS 2010). Despite this interest, the pending collapse of pastoralism in many parts of the world has been largely exaggerated, albeit it has disappeared from some parts of Africa and south Asia especially where environmental conditions are favorable for crop production.

Nonetheless, the authors also recognize that pastoralist systems are undergoing considerable change driven by a range of external and internal factors, such as loss of key rangelands to agriculture and other non-pastoralist uses, population growth, increased impoverishment, settlement growth, and growing climate variability. As noted above, the exodus of many pastoralists out of livestock-based livelihoods in the past 20 years due to poverty, drought, and conflict has been a key trend, but policy makers often fail to acknowledge that despite this change pastoralism remains a critical livelihood strategy in large parts of arid and semi-arid Africa and South Asia. In many dryland areas, it is simply the only viable option under existing environmental conditions.

Thus, two key challenges that pastoral systems currently confront are: (1) loss of pastoral rangelands caused by encroachment of neighboring agriculturalists and farming by herders themselves, continued development of irrigation schemes in key dry season grazing and watering

zones, and land investments ("land grabbing") by outside investors; and (2) diversification and the diversion of labor to non-pastoralist activities, which partially explains the current transition toward more sedentary production systems where animals seasonally migrate with mainly young males but part of the family remains settled for much of the year. Regarding the latter, a similar base residence/mobile herd camp form of pastoralism has been practiced in southern Africa (Namibia, Zimbabwe, Botswana, and South Africa) for generations where the satellite camps there are called cattle posts (Hitchcock 1978; Van Waarden 1987). This strategy allows some family members to trade, work, and/or seek services in small towns and settlements on a part- or full-time basis, but raises a number of other challenges related to livestock management, ecology, and human welfare. In the Sahel region of West Africa reduced mobility, with more intensive grazing and labor use, and what Turner and Hiernaux call 'shifts in labor' (2008:74)' has been associated during the past two decades with the growing integration of pastoral livestock and crop farming (Ayatunde 2008; Turner and Hiernaux 2008); while in parts of northern India it has been associated with increased settlement and farming (Dangwal 2009).

Other challenges facing pastoralism today include (3) population growth and redistribution, including the growth of towns and small urban centers in pastoral areas. These settlements are likely to continue to grow considerably faster than the population rate of rural pastoralists, which will help to spur an increasingly diversified economy but also make growing demands on range and water resources. For example, one key pastoral town in northern Kenya, Marsabit town, has grown more 600 percent during 1969-1999 and has created exceptional demands on nearby water, forest, and grazing resources (Witsenburg and Adano 2003). As Little et al note, "these towns and the growth of rural-urban linkages will provide both opportunities and challenges to pastoral economies during the next 10 years." (Little et al. 2010b: 2).

Moreover, not only has there been rapid growth in towns but also insecurity in many pastoralist areas of Africa and South Asia has relocated large numbers of herders to more secure but increasingly populated zones, including mixed farming zones.

Other drivers of change in pastoral areas include (4) rising national incomes and levels of urbanization that will increase the demand for milk and meat products, which in many African countries will need to be met from pastoral areas; (5) increased climate variability and change; and (6) imposition of government policy. For example, the growing consumption demand for animal products (point 4 above) in Kenya means that about 67 percent of red meat consumed in the country is produced by pastoralists (Juma et al. 2010: 135-138). Additionally about 25 percent of the meat consumed in Nairobi originates from pastoral areas of southern Somalia, southern Ethiopia, and northern Tanzania. In terms of climate variability and change, extreme climatic events likely are to continue to affect pastoralists, livestock markets, and incidences of animal disease in sub-Saharan Africa. Although there remains considerable uncertainty over the direction of climate change in the region's drylands, with some models predicting increased incidences of floods rather than drought in some pastoral areas of Africa, extreme events (either prolonged drought or flood) already have had major impacts on pastoral livelihoods and markets.

Finally, government policy clearly is a 'driver of change' because of its impact in the rangelands, especially the most productive ecological 'patches' (river valleys). Policies normally favor non-pastoral uses of land, resources and public funds. Indeed, policy issues present a major challenge to pastoral systems and potentially affect each of the topics discussed above and the research recommendations for ILRI that later we make in Section (4). Some areas of research, such as marketing and land use, have very obvious connections to policy and ILRI

should engage policy in its pastoral systems research efforts, both in terms of understanding why certain policies are made and their impacts are on pastoralist economies and ecologies.

Despite these challenges and drivers of change, it is important when planning for a 10 year research strategy to think about what a successful pastoralist system looks like now and what it might look like in 10 years. From the perspective of livestock owners, a successful pastoral system is one that can cope with and recover from the normal range of shocks (especially droughts) that are confronted in drylands. To sustain a pastoral system for 20+ years without devastating economic losses, environmental degradation, human hardships, and unusually high out-migration would be considered a successful model. This time period would cover for most pastoralist regions at least two full cycles of drought and recovery. All the elements that contribute to such a successful pastoral enterprise—for instance, species and breed diversification, sustainable resource use, marketing and income diversification strategies, mobility, and flexible tenure regimes—is what should be studied and supported by outreach programs in the future.

There is one important caveat to the above scenario, which is that impoverished ex-pastoralists who for a range of reasons, including inadequate access to grazing and herds, will not be able to or will not choose to remain in pastoralism. This trend is unlikely to diminish in the future. Therefore, from a regional perspective a successful pastoral system also should be one where there are beneficial linkages with urban and non-pastoral sectors and the broader economy generally, so that those exiting pastoralism have livelihood options. This more positive scenario of rural-urban ties contrasts with the current situation where ex-pastoralists often cluster in unsustainable urban settlements and seek meager income from petty trade, unskilled labor, charcoal production and trade, and/or relief activities like food aid.

It also is important to distinguish between pastoralists themselves and pastoral regions, those rangelands where they live. Pastoralists are those where livestock are a dominant part of their livelihoods (>50 percent of total income), but in many pastoral regions/rangelands non- and ex-pastoralists also reside. There also are settlements and towns where non-pastoral enterprises are important and activities exist that may not necessarily involve livestock, such as wildlife conservation, tourism, and mining. The distinction between a focus on pastoralists and pastoralist regions (which includes both pastoralist and non-pastoralists) has significant implications for what is addressed in a research program, the methods used, and the potential policy implications of the work. For instance, research on safety nets and relief programs in pastoral regions often deals more with ex-pastoralists or non-pastoralists than with active pastoralists. Payment for Environmental Services (PES) work, in turn, may be more concerned with incomes and payments from non-livestock activities (e.g., wildlife or water conservation) than with incomes and products from pastoral production systems. By contrast, a research program on dryland livestock species and breeds is likely to have immediate relevance to active pastoralists whose main asset and source of income remains animals. At ILRI one finds research programs that are focused on pastoralist and pastoral production systems, as well as ones that are more concerned with pastoralist regions or landscapes.

3. CURRENT PASTORAL SYSTEMS RESEARCH AND ILRI's ROLE

Approximately 50 percent of Africa's and 10 percent of South Asia's land is used by mobile pastoralists who may be nomadic, transhumant, and/or semi-settled pastoralists and agro-pastoralists.[1] In Africa alone there are an estimated 50 million pastoralists and 200 million agro-pastoralists who "live from West to East across dryland Africa (Hesse and Cavanna 2010: 8)."

[1] Information on pastoralism in tropical areas of south Asia are highly unreliable and the literature is very sparse relative to Africa (see Blench 2000). This estimate is only for India and derives from estimates of extensive grazing areas based on a FAO web-based source (FAO 1999).

In the past five years several different studies have attempted to quantify the economic contribution of pastoralism to national GDP or GNP and, unsurprisingly, the results have shown that pastoralism contributes far more than is acknowledged by governments and development agencies. For example, in the Sudan, Ethiopia, and Kenya, pastoralist activities (directly or indirectly) are estimated to account for more than 25 percent of agricultural GDP (COMESA 2009: 6). Much of the work on economic valuation has been supported by international non-governmental organizations (INGOs), for example International Union for the Conservation of Nature (IUCN) and the World Initiative for Sustainable Pastoralism (WISP) program, and ILRI has participated in some of these activities (see Hatfield and Davies 2006). The quality of the data is questionable in some cases, but the point is well made that because cash values of herd breeding and milk production often escape official income surveys, the gross economic contributions of pastoralism are woefully underreported (ibid; Behnke 2008) . These economic valuation studies often have been used to argue for greater attention by policy makers to the economic contributions and potential of pastoralism and potential economic losses when pastoralism is threatened or replaced.

3.1 Important Themes in Pastoral Systems Research

Several areas of research on pastoral systems have been emphasized during the past decade. ILRI's role here has ranged from an active leader to one where it had little involvement. As noted earlier, ILRI has not had a coherent focus on pastoral systems research, although there were individual scientists and projects who worked on the issue or related topics. In this section, we briefly summarize some of the key themes in pastoral systems research as a prelude to presenting our recommendations for a medium-to long term ILRI research strategy (Section 4). We also discuss some of the concerns that were raised about coordination among different

research projects and units within ILRI. In fact, while all of ILRI's different research themes and departments have projects that deal either with pastoral populations or pastoralist regions (dry rangelands), many operate independent from each other and, consequently, in-house expertise may be underutilized.

3.1.1. Land Tenure and Land use

Studies of land tenure among pastoralists has attracted considerable research on a range of themes, including common property system, enclosures and privatization, government land reform efforts, and conflicts over land rights. Secure access to land and other resources, especially water, obviously is critical to the future sustainability of pastoralism. In fact, loss of key resources, especially of dry season grazing areas and water points, will probably be the greatest challenge to mobile pastoralism in the next 25 years, a point that is supported by much current research (see Little et al. 2010; Homewood 2008). These losses also will be spurred in part by population growth and expansion of rainfed and irrigated agriculture (see earlier discussion in Section 2). As Little et al (2010b) note, "the loss of key dry season grazing areas, especially to irrigation schemes in riverine areas, crowds herders onto less productive rangelands which undermines their economic welfare, puts them into competition and conflict with other groups, and aggravates environmental degradation. The net economic result is reduced quality of tradable products and animals for local sale and export and higher costs for additional food aid for displaced pastoralists (2010b:15)."

ILRI played a role in some of the recent research on pastoral land tenure systems, especially when Matt Turner and Nancy McCarthy was on its staff during the late 1990s and early 2000s (see McCarthy et al. 2000; Turner 1999a). In recent years ILRI also has hosted others, especially post-doctoral researchers, who have done important tenure-related studies in

pastoral rangelands (see Mwangi 2007). However, it is not a major part of its current research program and we would not recommend allocating resources and efforts to 'jump start' work on resource tenure, except as part of other efforts (for example, a study of pastoralist vulnerability where access to land is a critical issue).

Related to the topic of land tenure is that of land use, which is of major interest to present ILRI work, especially to the PLE and Sustainable Livestock Futures units. Important themes here include competition between pastoral and other types of land use, the role of herd mobility in sustaining pastoral land use, the economics of pastoralism versus irrigated agriculture (see Behnke and Kerven, forthcoming) and wildlife/tourism versus pastoral livestock use (see Mburu et al 2003; Homewood et al 2008). ILRI has been involved with work related to competing land use systems, especially livestock versus wildlife and cropping systems (for example, Reto O Reto project http://www.ilri.org/retooreto), and demonstrating the economic and ecological benefits that can be accrued from multiple uses of pastoral rangelands. This is a topic that has received recent attention, especially PES (Payment for Environmental Services) studies for carbon sequestering potential, wildlife conservation, and water and catchment conservation services (Derner and Schuman 2007; Homewood et al. 2008). As will be discussed in the next section, land use studies in pastoralist regions--especially of multiple uses, PES, and landscape modeling--are activities that ILRI has in-house capacity and should continue to pursue and expand in the future (see the discussion in Section 4.1.2), .

3.1.2. Livelihoods, Risk, and Vulnerability

A third general area of pastoral systems research is livelihood studies (including risk and vulnerability aspects), which have resulted in numerous recent publications--including some where ILRI again has been an important partner (see Little et al 2008; Homewood et al. 2008).

In the past decade it been among the most prominent themes in pastoralism and among the most crowded in terms of researchers, NGOs, and research institutes involved. However, despite its popularity among researchers, much of it has suffered from definitional problems and a lack of longitudinal depth. Increasingly, research on pastoralist livelihood diversification has been undertaken under the general theme of risk management and much of it has assumed (often wrongly) that diversification is a first stage toward exiting pastoralism. With the departure of Patti Kristjanson from ILRI and the already considerable work in the area that is being done by other groups and researchers, ILRI's future work should be focused on more technical issues related to the role of livestock production in diversification, a topic that is underexplored, rather than livelihoods *per se.*

Related to the general theme of livelihoods are risk analysis and pastoralist vulnerability, especially as they relate to poverty and environmental risk. Studies of pastoralist vulnerability, for instance often have been conducted in the context of drought and/or other external shocks that can devastate livelihoods and leave herders especially vulnerable. Emergency provisions of veterinary inputs and feeds during shocks to save livelihoods and reduce vulnerability to chronic poverty and hunger also have been studied under this general theme (see LEGS 2009). Some of this livelihoods-based work has been conducted in the context of humanitarian studies, with groups like Tufts University, Overseas Development Institute (ODI), SCF-UK, Oxfam, VSF, and the Livestock Emergency Guidelines (LEGS) playing prominent roles in the past decade. The themes have been especially prominent recently as incidences of humanitarian crises, especially drought- and conflict-induced, have increased in dryland areas (see Hesse and Cotula 2006). As Little et al (2010b) note, work in the general area of pastoralist vulnerability and external shocks "leads us to the growing field of drought cycle management, where the challenge is to identify

innovative means to help pastoralists prepare for and cope with shocks in ways that do not inhibit the effectiveness of existing strategies to deal with such events (page #?)."

Along these lines ILRI is engaged in an innovative action research program, in collaboration with Cornell, Syracuse, and UC-Davis, that is implementing a climate index-based livestock insurance program in northern Kenya (and eventually southern Ethiopia) to address pastoralist risk and vulnerability. The project has received considerable attention and holds promise for allowing herders to better manage drought-related risks and recoup the massive economic losses associated with climate disasters. ILRI also has been particularly active in methodological approaches to measuring/identifying poverty and vulnerability and has pioneered the use of GIS and mapping to do this. These tools remain important and should continue to attract external funding. ILRI's capacity in GIS is widely applied in its mapping and modeling work on pastoralist/agro-pastoralist vulnerability and this specialization should continue to play a prominent role in ILRI's future work.

3.1.3 Rangeland Ecosystems and Environmental Research

Range ecology and ecosystems research received more systematic research by ILRI and other organizations in the 1980s and 1990s than currently is the case (see Oba 2009). Little et al note the lack of long-term ecological research is one reason that the Ethiopian government, for example, has been able to discard some of the work of NGOs as not being rigorous enough to inform policies. They suggest in the case of Ethiopia that "what has been lost is the connection between Ethiopian policy and international scientific best practices in rangeland ecology and pastoral systems generally (Little et al. 2010b: 19)." ILRI has not been a key actor in many of the recent debates in rangeland ecology either in terms of theories (for instance, the so-called equilibrium versus disequilibrium debates), methods, and/or the role of pastoralist mobility in

African rangeland ecologies. However, as we will argue later, ILRI should re-establish scientific work on the ecology of pastoral systems, a task that it is better qualified for than most other organizations (see section 4.1.2). It is an opportune time under the changing land and population circumstances in many pastoral areas to revisit some of the key discussions in range ecology, such as the equilibrium versus disequilibrium debate. ILRI, because of its focus on the animal, is inevitably a well-qualified organization to be a research leader on rangelands in arid and semi-arid environments.

3.1.4 Livestock Production and Animal Health

Livestock productivity is intricately linked to the productivity of the land. A fourth general area of pastoral systems research relates to animal production, breeding, and productivity which have lagged compared to other research topics. Indeed, much of the research and development work on pastoralism has been carried out by social scientists (primarily) and ecologists (secondarily), rather than by animal scientists and biologists with the result that new understandings of the basic asset of pastoralists —animals—and their biology has lagged in recent years. This topic calls for interdisciplinary work by ILRI and is unlikely to be carried out by other organizations involved in pastoral development (for example of this research at ILRI, see Ayatunde et al. 2007). As will be discussed in Section (4), ILRI can play a key role here working with NARS systems and pushing research agendas on livestock species and breeds important to pastoral regions.

Related to livestock productivity is animal health and zoonoses work that also has been conducted in pastoralist areas in recent years with some recent accomplishments, including the eradication of rinderpest. ILRI already has important research and vaccine development programs in animal health of pastoral areas (for example, ECF and CBPP work) and where

collaboration with other ILRI units and social scientists would be important for current and future work.

3.1.5 Market (value) chains

Marketing is another topic that has been a focus in the past 10 years, although much of this work has been concentrated in eastern Africa and, to a lesser extent, West Africa. Regional cross-border and export livestock markets have received more attention in the pastoral areas than studies of domestic and local markets, while cattle and meat marketing has received more interest than analyses of small stock and milk trades. The economic and social dimensions of marketing have been emphasized, although there are probably no more than 4 or 5 good detailed studies of livestock trade from pastoral areas and even less for milk and other products. ILRI was more active in studies of livestock trade, especially in West Africa, in the early 2000s prior to the departure of a key staff member (see Williams et al. 2006), but it is an area that is rapidly changing and cries out for new approaches and analyses. ILRI should play an important role (see Section 4.1.3 for how this theme can be addressed in a ten year research strategy).

3.1.6 Climate Variability and Change

Research on the effects of climate change and variability is another topic that is receiving increased attention, particularly since pastoralists may be especially vulnerable to future changes in climatic patterns (see Brooks 2006). Similar to other topics discussed above, this work overlaps with other research themes, including studies of drought coping and recovery strategies, vulnerability and risk, emergent zoonoses, and rangeland ecosystems. In fact, pastoralists themselves always have dealt with climatic uncertainties and variability, probably more than other rural producers. At the local level vulnerability studies of climate change often differ little from studies of pastoralist drought-coping strategies. At regional and macro-levels modeling

activities have received the bulk of climate-related research activities and ILRI has been an important participant in this work, especially in mapping and GIS applications (see Thornton et al 2008).

3.1.7 Conflict and Conflict Resolution

The study of conflict and conflict resolution in pastoral areas receives increased attention and often relates to issues of land loss and competing land use that were discussed earlier. Much of the conflict-related work has been dominated by International INGOs (INGOs) and local NGOs concerned with the resolution of conflicts, although some basic studies on the causes and impacts of conflict in pastoral areas have been conducted (see Mkutu 2008; Mahmoud 2009). Work on this theme has been concentrated in the pastoralist areas of the Horn of Africa and eastern Africa where modern armaments have been readily available and recent violence has accelerated. Increased conflict also has been an issue in West Africa (Turner 1999b; Benjaminsen 2008) and south Asia (Kavoori 2005). Some of this work has overlapped with activities related to legal and human rights, political participation and 'voice', and other types of pastoralist advocacy that probably is best suited for INGOs and local NGOs rather than groups like ILRI. However, the economic costs of conflict, in terms of animal and market loses, can be enormous (Umar and Baulch 2007) and would be relevant for future ILRI work on market chains (see Section 4.1.3).

2.2. Need for Better Coordination at ILRI

As the previous section indicates, there are considerable research activities at ILRI on pastoral systems that have been initiated since 2000. However, there was a strong feeling by those at ILRI whom we interviewed—and we would concur--that there was (is) little integration of these initiatives, and many of the current projects seemed to be in response to funding

opportunities and/or research interests of partners rather than an ILRI research agenda. This pattern is not unlike what one finds at many large research centers and university departments where time is scarce and individual funding opportunities can segregate rather than unite intellectual efforts. Indeed, it is clear that a lot of very good research related to pastoral systems and pastoralist regions (i.e., dryland rangelands) is being conducted by ILRI scientists, but it is equally apparent that it often is not well coordinated. For instance, what are the overarching research framework, methods, and questions that drive a pastoral systems research program at ILRI? At present there does not seem to be a coherent response to this query. As noted above, this is a systemic problem for many research organizations because of the nature of external funding from separate donors under individual projects, each with their own demands for reporting, topical emphases, and collaborative partnerships. The high reliance on external project versus core funding contributes to a fragmented research and development agenda and a lack of coordination among researchers across different initiatives.

Conceptually, some of ILRI's individual projects address similar issues—for example, pastoralist vulnerability— without much coordination, or provide important opportunities for additional research by other ILRI units and staff. A glaring example is in the general area of climate change studies where important individual efforts are on-going, but with only minimal coordination. Thus, there are important on-going efforts related to regional modelling of climatic impacts on different production systems, including pastoral and agro-pastoral systems; climate change's role in emergent zoonoses; and climate changes on pastoralist vulnerability, which might benefit from additional collaboration within ILRI (also see discussion in section 4.1.3). Ideally, in this case individual scientists from different projects working on climate

change should be consulted during research design or, better, during the proposal preparation stage, to increase the likelihood of eventual collaboration and synergisms.

We also observed that there often is a scale issue that might inhibit research integration and conversations across different projects and themes. For instance, there are on-going vulnerability analyses at global, regional, agro-ecosystem, and local levels. While the different analyses and spatial perspectives have a role, they often are carried out independent of each other with little possibility for looking at similar issues at multiple scales and levels. Once again, exchanges between ILRI scientists from different projects and disciplines would enhance research synergisms. There also are methodological issues where coordination could be improved. For example, participatory research methodologies involving pastoralists—which should be applauded and continue to be emphasized (see Section 4.1)--is a part of several different ILRI initiatives. For example, the PES work that was conducted in Kajiado, Kenya to reduce potential wildlife and livestock/cropping conflicts; animal health work and participatory livestock epidemiology (see Betts at al. 2009); and the Index-based Livestock Insurance (IBLI) work that fielded insurance experiments with herders all involved participatory research models. However, it is unclear how much communication and 'lessons learned' were shared among the different research projects and themes.

There also are issues related to inter-regional coordination and collaboration between regional programs. While most of ILRI's work on pastoralism is being conducted in eastern Africa, especially Kenya, there are important issues related to rangeland ecology, animal production, vulnerability/risk management, and marketing that would benefit from closer collaboration with partners in West Africa and, to a lesser extent, India. On more than one occasion staff concerns were raised about whether ILRI's existing work on pastoral systems is

too narrowly focused on eastern Africa and its special rangeland concerns, such as wildlife conservation and tourism. With a global mandate ILRI could help facilitate inter-regional collaboration and inter-regional capacity building and serve as a knowledge center for researchers and partner organizations wishing to pursue comparative, interregional work (see Section 4.2). Here links to regional groups like COMESA, IGAD, ECOWAS, and Club du Sahel would be recommended.

The product of such collaborative work, if approached holistically, has the potential to improve understandings of pastoral systems vulnerability for multiple audiences and policy makers. Equally important is the coordination of activities that has the potential to leverage resources, especially the human resource; and enhancing impact on lives of intended beneficiaries of the research results and those assisting communities. It is recommended that synergies be built between individual projects. As we will discuss later, this can be done by the establishment of Pastoral Research Task Team (PRTT), which will create a platform where researchers on pastoral systems can share ideas more regularly (discussed in more detail in Section 4.4.1).

4. RECOMMENDATIONS

In light of the above discussion on pastoralist research themes, where can ILRI assume an important role in pastoral systems research? The previous section points to specific areas where ILRI already has some comparative advantage and on-going programs. These include, for example, research on environmental addressing pastoralist environmental contributions to wildlife conservation; climate change modeling and its potential effects on local herders; pastoral risk management and vulnerability studies. In this section we make our recommendations on how ILRI can proceed with a focused agenda on pastoral systems research.

4. 1. Ten Year Research Strategy for ILRI

Here we highlight four general areas that ILRI should emphasize in the future based on the findings of this review (see summary in Table 1). These are areas where we feel that ILRI can be an intellectual leader or provide important 'value added' to collaborative efforts with other groups of researchers. Although these four general topics are presented as separate initiatives, they are strongly interrelated and call for inter-disciplinarity as well as collaboration among different ILRI units. Indeed, ILRI has significant potential to move interdisciplinary collaboration beyond what other groups can offer since they have 'in house' expertise in several key livestock-oriented disciplines, representing both social and natural sciences. Each of the

Table 1. Summary of Ten Year Research Strategy and Recommendations

RESEARCH THEME	KEY PARTNERS	FUNDING SOURCES
4.1.1. Livestock Production	NARS, Research Institutes, Private Companies	Science Foundations, Private Sector, NGOs, CG Core
4.1.2. Rangeland Ecology	NARS, Universities, NGOs, Environmental Research Groups	Science Foundations, Donor Agencies, CG Core
4.1.3 Market Chains	Private Sector, Regional Bodies (e.g., COMESA), Govt. Depts.	Foundations, Donor agencies, Regional Projects, Private Sector
4.1.4 Vulnerability	NGOs, Humanitarian Agencies, Universities, Research Institutes	Donor agencies, Humanitarian groups, Climate Change Funds

topical areas discussed in this section would benefit from interdisciplinary teams and collaboration.

It also is recommended that for each of the thematic areas identified participatory research and development approaches significantly involve pastoralists in research design, implementation, and the identification of research and policy applications. Participation of pastoralists and participatory methods should be integral parts of ILRI's pastoral systems mandate. There are important reasons for this beyond the obvious one, that the development implications of study findings will have a greater chance of implementation and success if they are consistent with the needs and priorities of pastoralists and the latter have been actively involved. Incorporating the knowledge and priorities of herders will also make for better science, both for biological and social sciences; for example, there is much to learn from pastoralists' understandings of herd management and breeds, market preferences, and climate. 'Lip service' about local participation often is paid by researchers and organizations, but ILRI has a real opportunity to move applications and innovation to new levels. ILRI should try to learn from the different ways of working with and communicating with pastoralists, including new ways to work with different development partners (see Section 4.2.2).

4.1.1 Pastoral Livestock Production: animal species and breeds important to pastoralist production

Most research in pastoral systems recognizes the importance of species differences, but fails to acknowledge the significance of breeds. If pastoral systems are looked at closely, key characteristics emerge such as:

1. ability of animals to go for extended periods without water;

2. capacity of animals to survive on low energy diets;
3. adaptation to droughts;
4. heat tolerance; and
5. tolerance to diseases.

These characteristics or traits are often associated with certain breeds within a species. Although points 1 and 3 above are related, they are presented separately here to emphasize that droughts (point 3) relate more to adaptation to climate change and variability, and adaptation to water scarcity (point 1) relates more to animal type (a good example of low water requirements is the camel). Moreover, large, less heat tolerant cattle, such as European grade animals, will not survive very well in pastoral systems, a point that has been proven numerous times but unfortunately overlooked by government programs that still promote non-native imports over indigenous breeds. With this in mind, it is, therefore, important that pastoral systems are improved through enhanced knowledge on the role that breeds can have in the improvement of livelihoods of pastoralists. The ability of the animals to survive and reproduce under conditions of mobility in dry and sparse environments has the potential to improve pastoral welfare.

ILRI is well suited among those institutions currently involved in pastoral research and development to provide scientific understanding on animal breed selectivity and preference. The work they currently are conducting on African animals genetic resources can provide the basis from which further research can be developed for breed characterization. It also can nicely link into ILRI (on-going or potential) efforts in livestock marketing, animal health, and poverty and vulnerability studies. For example, consumers show a certain preference for the meat and milk from certain breeds—for example, the Blackhead Somali sheep (Horn of Africa) which is considered a "delicacy in the Middle East (Umar and Baluch 2007: 39)," Boran cattle (Kenya

and Ethiopia), 'Baringo' goats (Kenya), the Bororo (Fulani) cattle in West Africa, and local camel milk in western India (Köhler-Rollefson and Mundy 2010:9) —and they fetch better prices on local and national markets. Finally, the involvement of African and non-African university departments in rangelands studies, environmental science, and human dimensions of natural resource management will help ILRI expand the scope of their work in this area.

Development partners, such as NGOs, can best service pastoral communities using some of the science behind selection/use of certain breeds/animal types and look at their impacts on gender, labour demand, marketing, and the resource base (ecology). In the absence of such information there is a danger that unsuitable animals and breeds will find their way into pastoral systems with devastating effects. One can paint a scenario where a donor agent, with good intentions, but uninformed by science, provides a pastoral community with animals that are not suitable for high temperature, low diets feeds, and are prone to diseases. In a short period of time the whole herd is destroyed, bringing untold suffering to a community and shattering the relationship between the donor community and pastoralists.

The need for a clear understanding of the role animal breeds play in the socio-economy of pastoralists links well with the objectives of CRP 3.7 (Livestock and Fish: Sustainable staple food productivity and increase for global food security) and CRP 5 (Durable solutions to water scarcity and degradation). There is a clear link between increased animal productivity, especially milk production, and impacts on water and land resources (see Section 4.1.2 below). Water limitation reduces forage productivity of the land requiring that management adapt to these changes. In the absence of knowledge to guide the adaptation, there is a tendency for continued over-exploitation of forages and water resources leading to degradation. It will be important for

ILRI's footprint to be visible in projects developed around livestock productivity and land degradation.

ILRI's experiences in animal breeding, especially in Africa, provide them with unparalleled opportunity to be intellectual leaders in the improvement of pastoral animal productivity and highlighting the role of certain breeds in different production systems and market channels. As noted earlier, it is important that pastoralist preferences for certain breeds and breed characteristics be incorporated. Market preferences together with other parameters should be studied to inform what breeds and species are preferred and how pastoralists can use these preferences to their advantage.

4.1.2 Pastoral Rangeland Ecosystems

The condition and ability of the rangeland to provide resources for livestock productivity is a function of the interaction between local management, ecological variability, and climatic factors. Managing the interaction of these variables requires a thorough understanding of their subsets. These include, among others, temperature, rainfall, socio-economic issues (labor availability, gender, wealth, economic pathways, etc) and strongly suggest the importance of interdiscipinarity in rangeland ecology studies. For example, there are documented cases where indigenous knowledge and practices have helped to sustain the environment, but also could be used to help conserve plants and animals in the future (e.g. for example, Maasai tolerance of wildlife and their taboos on eating game meat). These practices are underutilized and considered outdated by many scientists. Once again, participatory research programs that actively involve herders themselves would benefit future ILRI work on ecology. In fact, the approach to engaging and improving pastoral systems should be an acceptance that this is yet another production system and livelihood, whose actors are doing everything in their power to sustain

themselves and their ecology. Any interventions in environmental programs should view pastoralists as integral partners in the improvement and sustainability of rangelands. CRP 1.1 (Integrated agricultural production systems for dry areas), CRP 5 (Durable solutions to water scarcity and land degradation) and CRP7 (Climate Change, Agriculture and Food Security) have a bearing on the management of rangelands. ILRI needs to plant themselves firmly into these CRPs and champion research relating to rangelands, especially in arid and semi-arid environments which form the bulk of habitats for pastoralists.

The kinds and amount of ecosystem goods (e.g. grazing, fuel wood, honey, fruits and vegetables, water, minerals) and services (carbon sequestering, water conservation and purification, habitat) that pastoral systems provide is not fully understood and harnessed, particularly due to limitations in knowledge. ILRI can play an important role in research mapping of ecosystem goods and service, and ensuring their full accounting, particularly as they relate to livestock productivity (e.g. grazing, water availability, ethno veterinary plants). There is already research within ILRI towards such activities. The recommendation is that accounting of environmental services be improved by matching appropriate competencies to these activities, which will improve the utility/value of the results. For example, an environmental economist will better understand and account for the value of environmental goods and service compared to a non specialist in the field. A focus on the benefits accruing to pastoral communities is important since they have the potential of diversifying incomes and thus improving risk management strategies.

The practice of pastoralism is premised on the ability to move, especially to track forage and water. Increased settlements, in many countries, result in the reduction or breaking-up of migratory routes and reducing the size of grazing resources at each location; in some cases

leading to conflict and the spread of animal diseases. Reduced mobility has the unintended consequences of increasing pressure on rangelands where occupation time is increased. Research needs to quantify the effects of increased settlements and reduced pastoralist mobility on productivity and the general ability of rangelands to provide goods and services. ILRI is in a position to provide the strong ecological research that is required to re-visit debates about the role of mobility in sustaining rangeland resources, especially when mobility is highly constrained due to loss of seasonal grazing and to political factors; and the debates about disequilibrium versus equilibrium models of pastoral rangeland and systems. Increased settlements further increase demands on rivers (irrigation, human consumption, industrial activities) with consequences for water volume and periods of flow. This has led to moisture reduction in flood plains (wetlands and vleis) which often provide key dry season forage. This often leads to conflict between pastoralists and crop producers (see Little et al. 2010a; and a web-based video http://www.worldlakes.org/uploads/kenya_river.htm).

With increased settlements often comes the need for cultivation, an activity that not only reduces the grazing resource base but also can lead to conflict, especially when animals destroy crops or when fields block migratory routes. The desire to crop and the need for mobility is a challenge that requires careful research and spatial planning by public authorities and ILRI is well positioned, particularly in East and West Africa, to take on such research. Compounding or even driving the encroachment of cultivation into grazing areas may be a result of global climatic change, which is likely to grow in severity in the future. It is important that research looking at adaptation options and opportunities is developed for pastoral systems. ILRI's effort should focus on the role that expanded cropping areas can play in the provision of feed for livestock, particularly the residues. Diversification of livestock production activities and markets should be

looked at and ILRI's work, through the CRP5, can make significant contributions in this general area. Once again, this calls for interdisciplinary research teams and collaboration among different disciplines that work in the sphere of crop-livestock production systems.

4.1.3 Understanding Different Pastoralist Market (Value) Chains

ILRI should address innovations in new livestock marketing chains and systems and how poor pastoralists and women can access them. Institutional innovations in pastoral livestock marketing, such as the increased use of auctions, contractual arrangements between meat processors and buying agents, and informal marketing cooperatives, are important areas that need additional research, especially in addressing how small-scale pastoralists participate in and benefit from these institutional arrangements. ILRI would be in a position to partner with other groups working in the area of marketing. Much of the value chain work in pastoralist areas focuses on actors (traders and brokers) and institutions in post-production processes higher up in the market chain and does not include producers themselves. A value or commodity chain approach would allow one to examine processes and actors from producer to consumer levels, which has rarely been done with the deficiency that actors and processes at both end of the chain—the producers and consumers—are left out of many studies. We know a little about consumer preference for certain animal breeds produced in pastoralist areas (see 4.1.1 above), but we need to better understand how these preferences influence price, supply response, and animal breeding practices.

An initiative in the thematic area of pastoral marketing should address:

(1) *Trade in high-demand, livestock breed preferences ('brands') and its economic and social benefits and costs:* Some of the important breeds were mentioned earlier in the

report, as was the importance of understanding consumer preferences and demand characteristics.

(2) *Domestic markets and new trade pathways*: Despite widespread enthusiasm from governments and certain donor agencies for international export trade, national and regional markets are far more important. This is partly due to the fact that chilled beef exports from eastern Africa are not competitive internationally with Brazilian and Indian beef and are not likely to be so without major changes, especially in the costs of animal feed (Rich et al. 2009). In Africa the growth in domestic and regional markets in recent years far outweighs any gains that have been made in international/overseas exports either of live animals or meat and beef products (see McPeak and Little 2006).

In addition to the above, there needs to be better understanding of supply chains from pastoral lowlands to other kinds of market outlets, including the use of informal feed lots near key urban markets; small-scale farms where lowland animals may be fattened for final sale or, in the case of oxen, used as draft animals; wholesale butcheries and meat processors; and commercial ranches/private grazing lands where immatures are grazed and grown out in anticipation for sale. The study of these outlets is critical to understanding the full value and complexity of domestic livestock markets.

(3) *Regional export/cross-border trade*: Understanding of regional export or trans-border livestock markets have improved in the past 15 years, but there still is much to be learned and gained from further study, especially in policy-based research. ILRI could build on the solid research that T. Williams conducted on regional West African trade and apply some of those methods and policy prescriptions to eastern Africa. Right now we know little about what the real costs and benefits to traders and other market actors of

incorporating informal cross-border trade into official export market channels; the types of financial arrangements that would be needed; the animal health modalities that would be required to formalize this trade; and how export requirements could be streamlined. An example includes livestock exports to Sudan from western Ethiopia where both formal and informal markets occur in close geographic proximity, and where the trade is growing. ILRI researchers have conducted some preliminary studies there and these could be built upon in a more integrated, comparative fashion. Because many governments still are unaware of the value of cross-border regional trade it often is treated as unsystematic and illegal. There is important policy work that ILRI could undertake in this area.

(4) *Domestic dairy trade:* Although it is rarely acknowledged, milk is overwhelmingly the largest component of pastoral household incomes. However, much of the value of milk is consumed within the household and not traded commercially, so it often escapes official surveys and economic assessments. An increased emphasis by ILRI on dairy production and trade would address problems related to pastoralist vulnerability and food insecurity; increased income opportunities for women; and economic diversification (see McPeak and Doss 2006). This research topic also could be linked to ecological productivity studies discussed earlier (see Section 4.1.2), since dairy production is strongly influenced by the natural resource base and its seasonal productivity. In the context of a rangeland ecology program, milk production and trade would be a productive area to pursue interdisciplinary programs. Research also could be conducted on innovations in milk storage, processing, and transport. Finally, this research topic links nicely to CRP 1, 3.7, 4, and 5.

4.1.4 Innovations in vulnerability reduction

At ILRI research and development work on pastoralist vulnerability largely is represented in the PLE unit, the IBLI activity in the Poverty and Gender group, and climate modeling work in the Sustainable Livestock Futures group. Different ILRI work on vulnerability needs to be better integrated with similar in-house efforts. A research and development program in this area would include a narrow set of characteristics of pastoralist vulnerability and—once again--would call for increased inter-disciplinarity. The key aspects of vulnerability that ILRI can address in this theme, in partnership with others, include:

- **Asset and poverty (IBLI experiments)**: This work by ILRI already is on-going but could be broadened to include other issues than just climate-based insurance. There is an important potential, for example to tie some of this work both to ecological research—which we understand PLE theme may soon initiate—and climate change work. The ecological implications of smoothing out the natural weather-induced 'boom/bust' cycles through livestock insurance would be an important topic to investigate; while changes in climate patterns could have obvious impacts on a weather-based insurance model.
- **Climate variability and change**: It is unclear to what extent pastoral areas will be affected negatively by climate change, but it is certain that there will be regional variation, especially between eastern and southern Africa. How pastoralists can adapt to climate variability/change and the analyses of measures for mitigating pastoralists' vulnerability to climate change are important topics for ILRI to address. Climate change will remain a key focus of many national and international programs and ILRI is well positioned to continue to contribute in

areas, such as regional modeling and GIS/mapping of impacted areas, but also should look at climate change impacts on livestock and dairy marketing, pastoralist welfare (including women), and resource use/mobility strategies. There also are potentially positive impacts of forecasted climate change, such as increases in flood-dependent pastures in areas where increased climatic extremes (e.g., floods) are predicted, that ILRI could examine.

- **Animal disease/emerging zoonoses:** With increased settlements and changing climate patterns in dry regions, pastoralists' herds increasingly may be vulnerable to animal diseases. ILRI's biotechnology group right now is doing important work in pastoral areas on CBPP and CCPP, both animal diseases for which pastoral herds are particularly vulnerable. There also is work on emerging animal diseases, such as RVF, related to climate change which would greatly benefit from interdisciplinary collaboration.

4.2 Additional Resources Required

To accomplish the proposed 10-year research strategy, there are several types of resources that ILRI would need to mobilize, including personnel, new partnerships, and funds.

4.2.1 Staff

ILRI requires additional disciplinary strengths in pastoral systems research, including a scientist (social or natural scientist) who clearly identifies as a pastoral systems specialist. First, to pursue a 10-year research strategy ILRI should hire an ***ecological or economic anthropologist*** with in-depth research experience in pastoral areas who would participate in important pastoralist policy and international research networks (E.G., IDS/Sussex and IIED and engage pastoralist-oriented debates in journals like *Nomadic Peoples, Agricultural Systems,* and *Pastoralism:*

Research, Policy and Practice. It would help ILRI to be seen as an important research and policy leader in pastoral systems research and development, which it was in the 1970s and 1980s when its predecessor, International Livestock Centre for Africa [ILCA]), had long-term pastoral system programs in eastern and west Africa—as well as several staff (including anthropologists) who specialized in pastoral systems research.

A second area where ILRI should look at adding strength is ***rangeland ecology with specialization in tropical systems***. Once again, preference would be for a person who has worked with extensive livestock systems in arid and semi-arid tropical areas and has been part of interdisciplinary programs. The scientist would also need to be conversant in current research that addresses the role that environmental services can play in generating benefits for pastoralist communities. A third area of need is for a ***resource/environmental economist,*** which probably could be filled from among existing ILRI expertise with slight changes to project responsibilities. What is essential is that any new staff in this area (and the rangeland ecologist position) have experience in pastoral systems research and conditions; understand about production systems where herd mobility is important; understand the unstable conditions of dryland environments (including arid ecosystems); and accept the fact that standard service delivery and development models need to be adapted/modified in pastoralist regions.

4.2.2 New Partnerships

There are considerably more actors, especially non-governmental organizations (NGOs), in the field of pastoralism than there were 10 or even five years ago. Thus, it is important that ILRI not only identifies areas where it has or can have a comparative advantage, but also which partners might be effective collaborators. Yet, most NGOs come with their own agendas (sometimes narrowly defined) and mandates—whether it is to conserve biodiversity, advance

human rights, promote indigenous peoples, or address child health and nutrition—so it is prudent to insure that the NGO's goals are consistent with research and development objectives of the particular ILRI program. Some NGOs will be more familiar with research needs and publication requirements of scientists and will be considerably easier to form partnerships with than others. It also should be noted that certain research themes, such as the vulnerability theme (Section 4.1.4), will have greater opportunity to partner with NGOs (especially those involved in humanitarian work) than those working on other research topics.

The plethora of NGOs and the dearth of government extension and delivery systems for pastoral communities also call out for new participatory models for linking research outputs to development partners and programs. At present ILRI only has a few strong partnerships with NGOs who are actively working on pastoralist development. The need to understand these linkages opens up new areas for research on different outreach models for collaborating with pastoral communities in research programs. The aspects of a new model for pastoral partnerships and outreach should recognize the following:

(1) **NGO partners:** As noted above the NGO environment is very complex and crowded and ILRI needs to be willing to innovate and identify key local ('on-the ground') and International Non-governmental Organizations (INGOs) partners with long-term interests in pastoral systems/dryland regions. ILRI already has collaborated with many INGOS, like IUCN (especially the World Initiative for Sustainable Pastoralism [WIS]), IIED, Oxfam, FarmAfrica, CARE, Veterinnaires sans frontiers, and SCF. In most cases, INGOs already has several local NGOs with whom they work and as a research organization, it probably makes most sense to work through INGO networks to access local

NGOs, although there is a danger that some outstanding local partners might be missed and that an INGO might direct ILRI toward local NGOs that they fund rather than the most appropriate. While the decisions about which NGOs/development partners to work with under a specific research/development program should be left to ILRI researchers and management, other groups that seem to be consistent with the 10-year strategy outlined here include Pastoral Concern Association of Ethiopia (PCEA)—important national NGO in Ethiopia; Pastoralism Forum for Ethiopia (PFE)—important 'umbrella' NGO; SOS-Sahel—which is involved in carbon sequestering work in rangelands as well as economic valuation work for pastoral systems Africa; League for Peoples and Endogenous Livestock Development (LPP)—which promotes attention to indigenous livestock breeds and their conservation; LIFE (Local Livestock for Empowerment of Rural People)— it has programs in India with local NGO partners; and LEGS (Livestock Emergency Guidelines)-a training group to educate local development and government workers on different livestock-based interventions during emergencies.

(2) **National and Regional Public Partners**: There also is a need to pursue partnerships with regional and national public partners, including National Agricultural Research Systems (NARS) and policy makers, to insure that research and impact results have access to policy and decision-making channels. A new effort in pastoral systems calls for innovative ways of working with national government institutions, since many NARS and other

public research bodies have minimal research presence and expertise in pastoral areas. As a global centre with national, regional and world-wide demands, ILRI's mandate can conflict with national and even regional demands for their expertise and assistance. ILRI should avoid national demands on its research resources that are not consistent with its own research strategy and expertise. ILRI also needs to complement national-level partnerships with agreements with regional bodies, such as COMESA and CILSS, and with African Union (AU). All of these groups are engaged in pastoralist policy work on topics, such as regional livestock trade, animal health, and pastoralist food insecurity, and would provide important opportunities to engage important policy debates. ILRI currently collaborates with AU-IBAR, which could be a platform for engaging regional policy issues in animal production/health.

(3) **Training and Capacity Building**: A ten-year plan needs to involve training and capacity building to educate NARS and other government institutions about the economic, environmental, scientific, and social value of pastoral systems research and development. Following point (2) above, capacity building for partners will be important, especially with African universities and other local research bodies involved in pastoral systems research and development;

(4) **Regional Knowledge Center on Pastoralism and Capacity Building:** ILRI should consider building its own capacity as a knowledge broker for development partners in key research areas--such as pastoralist rangeland

systems (including the role of environmental services), climate change impacts on pastoralists, indigenous animal production/breeds, and pastoralist vulnerability (for details, see section 3 and 4.1). ILRI's advantage will be its global reach, research networks, and geographic location in key regions where pastoralism is important. In short, ILRI is in a position to become a type of knowledge and research resource center for the many NGOs, government agencies, and other development groups working on pastoralist development. It should strive to do this and can institute a report and research brief and policy series on pastoral systems and development that would be very useful to development partners needing immediate and relevant information.

4. 3 Proposals for Mobilizing Resources:

There are several opportunities for proposal development and fund raising for the work described in Sections (4.1) and (4.2). Virtually all bi-lateral (e.g., DfID, USAID, DANIDA, and GTZ) and multilateral donor organizations (UNDP, FAO, IFAD, World Bank, ECHO, FAO, and EU) and several foundations fund activities related to pastoral systems. Many of them will require that development and policy applications receive as much, if not more attention than basic research activities. Recently, EU (IFAD, FAO (e.g., pro-poor livestock policy and global animal genetics work), UNDP (e.g., its Dryland Development Centre), USAID (e.g., the new Livestock-Climate Change CRSP, pastoralist livelihoods and trade programs in Kenya and Ethiopia, and on-going pastoralist policy work with COMESA), and DfID (e.g., pastoralist economic policy work in Ethiopia and its Pastoralist Communication Initiative [PCI]) have funded pastoralist research and development work. There, of course, also are numerous

opportunities for seeking funding support for work on pastoralist adaptations to climate change and ILRI already is participating in some of these initiatives.

A pro-poor, innovative proposal on value chain analysis of different pastoralist livestock market chains should be of interest to the Gates Foundation (which has funded livestock-based market chain work), the EU/UNDP "Improving Market Access for Dryland Communities Project (MAP)," and different bi-lateral offices of USAID and DfID—both of which have funded research on trade in pastoralist areas. There also are possibilities for mobilizing funds to develop a short-term training program to enhance research and development capacity of government partners (NARS), local university departments, and other partners who would benefit from ILRI's experiences in pastoral systems research. Funding for such initiatives could come from bi-lateral donor agencies (DfID, CIDA, USAID, and others), IDRC, Rockefeller and other foundations, as well as UN bodies like UNEP, UNDP, and FAO.

An integrated proposal for work on pastoralist vulnerability that included innovative approaches and strong partnerships with development partners, for addressing 'relief-to-development' concerns in pastoralist areas should be attractive to funding sponsors. The IBLI work is one example of this. Evidence-based, sustainable approaches to the development of shock-prone pastoralist areas is not within the normal purview of local NGOs involved in humanitarian work, but it is on the 'radar' of many funding agencies. As a knowledge broker, ILRI would be in a position to provide research input to this critical topic of concern: that is, identifying mechanisms to move humanitarian-prone pastoralist regions from unsustainable relief modes, to longer-term development programs. These would be based on understandings of livestock production, sustainable resource use, and trade. There is considerable interest in mitigating pastoralist vulnerability in shock-prone areas (see Alinovi et al. 2008), but little of it

deals with the environmental, marketing, and animal production aspects of the debate--and these are areas where ILRI could contribute.

Finally, ILRI's work on pastoral systems is most identified by its east African programs, particularly in Kenya (primarily) and Ethiopia. Many of the research/development themes identified in this proposed research strategy would benefit from increased West African and, in some cases, southern African research (e.g., PES studies), especially since several interior African countries have relatively large pastoralist populations. Moreover, some of the key work on pastoral marketing, pastoralist vulnerability, and rangeland ecosystems has been conducted in West Africa, while innovative pastoralist community wildlife programs are found in southern Africa (e.g., Namibia and Botswana). ILRI should consider additional pastoralists research sites and/or programs in West Africa that are long-term with clear monitoring and benefits identified for pastoralists.

4.4 Proposed Next Three Steps for ILRI

ILRI asked us to consider what three actions could be taken almost immediately (within 1 year) to launch a longer term research strategy for pastoral systems The following are three actions that can be taken within the next year, which would greatly assist ILRI to coordinate and develop its pastoral systems research efforts.

4.4.1 Pastoral Research Task Team (PRTT)

The establishment of a PRTT would provide a platform where researchers on pastoral systems regularly can share ideas, develop proposals, and discuss development applications. This team could be 'virtual' to some extent and would open up a means of regular communication among staff with project portfolios and interests in pastoral systems and rangelands. The PRTT should go beyond shared interests of different units and scientists. It

should be structured such that it institutionalizes (across units) the dialogue and development of an interdisciplinary research agenda around pastoralism; initially within ILRI, but eventually including other stakeholders. PRTT is not intended to be yet another ILRI unit that comes with added administrative and logistic burdens; it is meant to allow and increase communication on institute wide engagement in pastoral research and coordination of efforts, leveraging human and financial resources, while fostering/enhancing ILRI's credibility among communities it serves. PRTT will allow for one vision for pastoralism from plural disciplines at ILRI's disposal. PLE is best positioned to champion the setting up of such an entity. For the task group to have increased credibility within ILRI, it also would need to be endorsed at the deputy DG or DG level.

4.4.2 Preliminary Integrative/Synthesis work

As part of the CCER review process, ILRI undertook an assessment of its projects and publications related to pastoral systems that either are on-going or were completed since 2000. Using this and the creation of a Task Team as starting points, ILRI should begin integrative and synthesis work among on-going projects that integrates work being done at different scales; addresses common methods already being undertaken; identifies similar lessons and research findings from on-going projects. The idea would be to see what 'value added' aspects can be gained by doing some integrative/synthesis work across on-going projects, which could lead to the kind of collaborative proposal identified earlier. It also would be beneficial if ILRI re-visited some of the data from its earlier long-term ecological, animal production, livestock marketing, and socio-economic research in West and East Africa. In doing so, it might be possible to identify baseline information that could be used to conduct longitudinal analyses of key changes in pastoral areas and production systems that could point to larger trends with important policy implications. ILRI had a number of high quality research programs in pastoral areas from the

1980s-2000s that generated considerable data and publications. This work could continue over multiple years and constitute an activity within a longer term plan (3-5 years) and would be attractive to external funders.

4.4.3 *Development of 1-2 interdisciplinary proposals*

Through the PRTT and ILRI's normal response process to RFPs and proposal requests, 1-2 interdisciplinary proposals should be developed on one or more of the four recommended research subjects/themes identified in Section (4.1). This activity would need to have the participation of at least two (and preferably 3) of ILRI's five different theme units and a team both of natural and social scientists. This exercise can also be used to identify immediate disciplinary needs that can be met either through post-doctoral fellowship or permanent staff arrangements.

In closing, this report has presented the results of a panel review on pastoral systems. It has identified a 10-year research strategy with four thematic areas and recommendations for partnerships, staffing, and resource mobilization. We feel ILRI should pursue a long-term strategy if it is serious about developing an integrated research and development program on pastoral systems. In addition, the report has pointed to three immediate actions that ILRI could take to strengthen its pastoral systems research and some longer term investments that would be required to sustain it over the next 5-10 years. As we have noted, there is much good work that ILRI already is doing related to pastoralism. A more coherent research program, with greater depth and expertise in certain areas, will only enhance this activity and place ILRI in a position to be a leader in selected important areas of pastoralist research and development.

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Annex A (memorandum from ILRI):

Centre commissioned external review (CCER) – pastoral systems

Purpose and scope

ILRI seeks to undertake a review of pastoral systems research for development that will guide the development of a relevant and focused agenda on pastoral systems for the institute and its key partners (including the context of the evolving CGIAR). Such an agenda will respond to the need to increased understanding about the vulnerability of pastoral systems in relation to a diversity of drivers and changes; enhance the resilience of pastoral systems where there are significant numbers of people in the most vulnerable ecosystems and build on the expertise of ILRI and its partners to achieve measurable impacts over the short-medium term (5-10 years) whilst enhancing partner capacity to continue to respond over the longer term.

The focus of the review will be on nomadic and transhumant livestock (cattle, small ruminant, camel) based systems in tropical regions of sub Saharan Africa and south Asia. Included are livestock dependent settled households where all or part of the herd is away from the homestead permanently, seasonally or temporally (eg some rangelands).

Context and challenges

Pastoral systems in developing countries are changing in response to a combination of local and global drivers of change which impact on their productivity, incomes, livelihood and lifestyle sustainability and resilience. Of particular concern are potential impacts on the resilience of pastoral systems to hazards resulting in increased vulnerability of both people and the environment. These changes and concerns raise new challenges for addressing poverty and improving the livelihoods of pastoral people and the options for livestock based pathways out of poverty.

There have been, and still are many development initiatives that aim to manage the drivers of change in pastoral systems, to enhance productivity, and improve environmental management and sustainability. ILRI's past and on going research has addressed some of these aspects, meaning there is some understanding of what has and has not worked. Interventions that worked in the past may lose their effectiveness as systems change. There may thus be need for a more forward looking research for development agenda that will guide the work of ILRI and its partners to ensure impact on pastoral systems that are the most vulnerable in the context of the external and internal challenges they are likely to face in the coming decades. This includes defining the mix of research skills and approaches as well as the inter linkages with the broader development agencies that will work to address the challenges of pastoral systems productivity, sustainability and resilience.

Tasks and approach

The review requires a broad assessment of the current landscape regarding pastoral systems in order to place the ILRI-specific recommendations in the appropriate context and to be forward looking. In this respect, the process will include two phases. The first is the development of a number of key

background documents which will feed into the second phase which will focus on developing recommendations based on this broad background together with engagement with ILRI staff.

Background documents – to be finalised by mid October 2010

1. Assessment of the current status of pastoral systems in tropical sub Saharan Africa and South Asia to identify where there is greatest potential for positive changes (including productivity, incomes, sustainability and resilience and drivers influencing opportunities), including where there are gaps in research/development interventions. Gaps should be defined in relation to a consideration of what successful pastoral systems look like and what is therefore the relevant research/development.
   Format: To be developed as a journal article (*Ecology and Society* suggested as it has a good impact factor = 3.2).

2. Assessment of current spectrum of interventions —by public, private and non-profit sectors, both for development and increasingly emergency relief -- targeted at pastoral systems in tropical sub Saharan Africa and south Asia, their actual and/or potential impacts, and the implications for policies and programs, including research. This will build on recent major reviews of pastoralism.
   Format: To be developed as a journal article.

3. Inventory of current research by ILRI with other CG and NARS partners in terms of the coverage, depth, relevance and actual/potential impact, in light of the outputs from 1 and 2 above. This should include a consideration of the potential future role of private sector partners as well as the positioning of the research in the context of the new CGIAR mega programs, especially (but not exclusively) those on dryland systems (MP1.1), water and land management (MP5) and climate change (MP7).
   Format: ILRI discussion paper.

Review and recommendation process

Recommendations will consider the changes in the scientific/research focus, geographical scope and involvement of different partners and disciplines that would be most likely to improve the focus, effectiveness and impact of ILRI's research. They will be articulated in the context of four sections:

- Suggestion for a 10 year pastoral systems research strategy for ILRI that builds on experience and research capacities and aims for increased relevance, impact and effectiveness in the designated regions.
- The additional resources (covering the spectrum of funds, skill (human resources), partners etc) that would be needed for successful implementation of this strategy.
- Proposals for where such resources might be sourced.
- Suggestions for the next three steps ILRI could take to implement this strategy.

Review team

The review team will consist of two persons, one with a broad understanding of research for development issues in pastoral systems (chair) and one with on the ground experience of pastoral issues. They will engage in the process of defining the scope and reviewing drafts of the papers above and will then use these products, in discussions with ILRI staff and the two consultants to develop the recommendations. It is proposed that the team engages with the development of the papers listed above then visits ILRI Nairobi for a period of 5-10 days in late October 2010 to finalise the report. The chair will present a progress report to the BoT in early November.

Annex B: Schedule, Nairobi Visit (based on schedule from Duncan Terere, ILRI)

CCER: *Pastoral systems*

Programme, ILRI, Nairobi

25th October – 2nd November 2010

Monday 25th October			
	1540 1650 1925	Sikhalazo arrives JKIA, SA184 Shirley arrives JKIA, KQ403 Peter arrives JKIA, KL565	Duncan to arrange visas, airport transfers, accommodation
Tuesday 26th October			
	0830	Peter and Sikhalazo meeting	Mara room
	0930	Discussions with ILRI staff (Augustine, Polly, Mario, Nancy, Jan, Andrew, An, Mohammed, Shem, Leah, Jane, Duncan, Shirley) on CCER and current status: Overview – Shirley (15 mins) Paper 1 – Jan (30 mins) Paper 2 – Nancy (30 mins) Paper 3 – Polly (30 mins) General discussion, overview of the week and potential subsequent meetings including plan for the afternoon	Mara room. Duncan to arrange telecom as required; refreshments.
	1230	Lunch	
	1400	Discussion paper 1	Mara room; refreshments
	1500	Discussion paper 2	
	1600	Discussion paper 3	

Wednesday 27th October			
	0830-1230	Peter and Sikhalazo working on report; Interviews and meetings with several ILRI staff	Mara room
	1330-1730	SKYPE Phone Interview, Jonathan Davies, IUCN; Continued meetings and discussions with key ILRI research staff	Mara room
	1900	Dinner	Mediterrano
Thursday 28th October			
	0830	***Ecosystem Services*** Sikhalazo, Jan, Polly & Mohammed	Mara room
	1030	Discussion on way forward	
	1300-1400	***Skype : Saverio Krätli*** Shirley, Sikhalazo, Peter	
	1500-1600	***GOK-Ministry of Arid Lands-Izzy Birch*** Peter and Sikhalazo	
	Have Lunch together /1700	***WRI-Norbert Henninger***	ILRI cafeteria
Friday 29th October			
	1030	Friday Morning Coffee - Introduction of Peter and Sikhalazo	
	1115-	Meeting, Peter, Sikhalazo, Shirley,	Directorate Meeting

	1215	John McDermott, Carlos Sere	Room
	1400	Meeting with ILRI staff, discussion of presentation for BoT, and tentative next steps	Mara room; refreshments
	1600	Peter and Sikhalazo transfer to Jacaranda	
Saturday 30th October		Peter and Sikhalazo working at ILRI campus on preliminary report and presentation to ILRIBoard	
Sunday 31st October			
Monday 1st November			
	0800	Peter and Sikhalazo pick up from Jacaranda	
	1145-1230	Presentation to BoT – Peter and Sikhalazo	
	1230-1400	Post BoT discussion – Peter, Sikhalazo, Shirley, John, Jan, Polly, Nancy	Directorate Meeting room. Lunch will be served
	1400-1830	Field visit to Kitengala field site; Sikhalazo, Jan	
	2255	Peter departs JKIA, KL566	Pick up point: ILRI-Mara House Pick up time1900hrs
Tuesday 2nd November			
	0705	Sikhalazo departs JKIA, SA183	Pick up time:0430 Location: Jacaranda Hotel