Livelihoods and basic service support in the drylands of the Horn of Africa

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technical consortium

Building Resilience in the Horn of Africa

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BRIEF 3

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Technical brief prepared by the Technical Consortium for Building Resilience in the Horn of Africa, a project of the Consultative Group on International Agricultural Research (CGIAR) hosted at the International Livestock Research Institute (ILRI).

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Abbreviations

ASAL	arid and semi-arid land
CAHW	community-based animal health worker
GDP	gross domestic product
GER	gross enrolment ratio
IBLI	index-based livestock insurance
IGAD	Intergovernmental Authority on Development
ILCA	International Livestock Centre for Africa
ILRI	International Livestock Research Institute
UNICEF	United Nations Children's Fund

Terms

Term	Countries
COMESA	Burundi, Comoros, Democratic Republic of Congo, Djibouti, Egypt, Eritrea. Ethiopia, Kenya, Libya, Madagascar, Malawi, Mauritius, Rwanda, Seychelles, South Sudan, Sudan, Swaziland, Uganda, Zambia, Zimbabwe
East Africa	historically, Kenya, Tanzania, Uganda
Greater Horn of Africa	Burundi, Djibouti, Eritrea, Ethiopia, Kenya, Rwanda, Somalia, South Sudan, Sudan, Tanzania, Uganda
Horn of Africa	Djibouti, Eritrea, Ethiopia and Somalia
IGAD	Djibouti, Eritrea (suspended), Ethiopia, Kenya, Somalia, South Sudan, Sudan, Uganda

Executive summary

This technical brief was commissioned by the Technical Consortium for Building Resilience in the Horn of Africa as one of a series of briefs. The Technical Consortium was established to support the Intergovernmental Authority on Development (IGAD) and national governments in the Greater Horn of Africa. ILRI is the host organization of the technical consortium, which seeks to develop regional, national and investment programs for the long-term development of the arid and semi-arid lands (ASALs) in the Horn of Africa. The objective is to support IGAD and common program frameworks to end drought related emergencies and build resilience in the Horn of Africa.

The briefs aim to identify key issues that need resolution or more evidence to make long-term development plans effective. The briefs are intended to guide project design by taking stock of ongoing interventions, policy frameworks and the potential contribution that investment in key intervention areas can make to the problem of recurrent drought-related emergencies and increasing vulnerability in the drylands. The briefs review the technical and economic rationales for priority interventions.

Pastoralism—being reliant on livestock as the main source of livelihood—remains the dominant and most economically rewarding activity in the drylands of the Horn of Africa countries, where rainfall is both low and highly variable. But dependence upon livestock is not the only source of livelihood for the inhabitants of these regions; many other income sources contribute to people's livelihoods. These diverse activities include rainfed and irrigated crop agriculture, wage employment, trade and harvesting of natural resources. Many dryland residents are increasingly engaging in an assortment of newer activities, which generate cash income, food resources, food security and investment opportunities. Thus, there are opportunities for both public and private investment to generate employment, income and welfare for the drylands peoples in the Horn of Africa.

The Horn of Africa rangelands remain a steady and significant source of livestock products of meat, hides and skins, for which there is an ever-increasing demand within and beyond the region. Therefore, it makes economic sense for national governments to encourage the retention of pastoralist skills in the drylands.

Recurrent crises and continuing need for relief assistance in the drylands underscore the need to build household resilience.

Demographic trends and livelihood diversification mean multiple strategies of development assistance are needed that target categories of dryland dwellers distinguished by wealth, location, mobility (or lack of it) and orientation to pastoralism. However, basic needs of human and animal health and education remain paramount, as pastoralists themselves articulate.

Past interventions to support livestock-based livelihoods are assessed in this paper. Animal health should be distinguished as a priority need, especially for upscaling new models of service delivery. Other types of support for livestock-based livelihoods are reviewed including animal feed, rangeland improvement, livestock insurance (a promising new direction), dairy marketing and conserving indigenous breeds.

Pastoralists have always engaged in a range of non-pastoral livelihood activities to supplement livestock production as a survival strategy when they lose herds, and as an investment strategy for the proceeds of successful livestock production. In many Horn of Africa areas, a significant proportion

of household income now comes from non-livestock activities. Crop agriculture is especially important as an alternative livelihood activity for pastoralists. Livestock production and non-livestock activities can complement each other through links of capital and labour investment among individuals, households and communities.

Recent writings suggest that fundamental demographic issues are at play in this region, which would mean that diversification should be intensified and that donors and governments should support a large-scale move away from livestock production. Even if the demographic argument is not wholly accepted, pastoralists who are diversifying, who wish to diversify or who have already dropped out of pastoralism all need support that must be sensitive to their livelihoods and their patterns of mobility.

Provision of education for pastoralists lags behind that for other people in the region, and differentials between girls' and boys' education are generally greater in pastoral areas. There are a number of overlapping challenges to establishing education systems that cater for mobile and low-density populations. Systems must be compatible with children learning pastoralist skills and do not culturally alienate them with negative messages about pastoralism; they must provide decent and secure schools. There is evidence that education directly affects pastoralists' capacity for positive forms of diversifying their livelihoods and for drought resilience.

The health status of pastoral communities is often poor, although it is unclear whether there are specifically pastoral patterns of ill health. Remoteness, low population density, pastoral mobility and poor infrastructure are constraints to delivering both curative and preventive health services.

With the erosion of traditional forms of mutual support and the undesirability of continued emergency relief, there is growing interest in social protection, which is increasingly seen as a 'basic service'. Safety nets and index-based insurance programs are promising approaches being developed as social protection measures for pastoralists.

Best practices can be identified in response to some, but not all, of the areas in which pastoralists and other dryland dwellers require support. Particular areas of best practice are:

- the growth of community-based animal health worker (CAHW) programs.
- irrigated agriculture on family farms as this can be a profitable source of livelihood diversification, but only where high-value crops can be produced for assured markets and not large-scale commercial irrigation schemes that expropriate productive land from local residents.
- well-planned and managed programs for collecting and marketing natural products from the drylands such as resins, honey, aloe and other bio-products for which there is growing consumer demand.
- the current initiative to provide innovative distance learning for pastoralists in northern Kenya.
- programs to realize synergy between animal and human health services, including a well-documented example in Chad.
- as pilots still under development and assessment, the current safety net program and initiative on index-based livestock insurance in northern Kenya.

As a cross-cutting principle, the private sector should be encouraged to continue providing—or delivering under contract—necessary basic services, and take on new servicing activities whenever doing so can be financially worthwhile to the business community.
Key challenges for research include:

- rebalancing country focus of pastoral and livestock research to pay more attention to pastoralist production in all the IGAD countries, not only Ethiopia and Kenya, as livestock in drylands contribute significantly to GDP in these IGAD countries.
- conserving and where appropriate improving indigenous breeds.
- improving livestock nutrition in an economically justifiable manner, particularly for milking animals and animals under fattening for resale.

- understanding diversification processes, their drivers and implications for people's mobility, service delivery, resilience and well-being.
- understanding, both through monitoring and evaluation and through longitudinal research, the effectiveness of different models of education, health services and social protection.

Key challenges for development include:

- upscaling and providing an enabling policy environment for CAHW programs.
- designing animal disease control systems that are affordable to pastoralists and national government and acceptable to international livestock product markets.
- conserving indigenous breeds.
- developing methods for equitable distribution of tourism and wildlife conservation revenues.
- supporting where appropriate spontaneous processes of intensification where these are equitable and environmentally sustainable.
- documenting and disseminating good practice in small-scale programs supporting livelihood diversification.
- new thinking and lesson-learning on institutional models for delivery of basic services, including social protection.

Background

Importance of increasing household food security and incomes for long-term resilience

A practitioner with many decades of experience working with donors, projects, NGOs and pastoralists in the Horn of Africa has cast a long gaze over the state of affairs. He sees 'some of the realities faced by the 20 million pastoralists and the international agencies that deliver emergency and development assistance in the pastoral arc of the Horn of Africa. … This all conspires to create a system that delivers "things" but does not deliver economic security to pastoral communities. … Someone shows up one day to give them something. … Every village in the pastoral areas of Kenya, Ethiopia, Djibouti and Somalia has a collection of sign boards announcing that "such and such" assistance was provided by "this" non-governmental organization or "that" and funded by … The amount of humanitarian assistance, primarily food staples, exceeds the amount of development assistance in part because the Horn of Africa is considered a place in permanent crisis' (Stockton 2012).

These are, very briefly, the reasons why household food security and incomes must be increased for the populations in the drylands of the Horn of Africa. Whether they remain or wish to continue as pastoralists or instead settle in small towns or large cities, the inhabitants of the Horn of Africa still require food, productive employment and their basic human needs to be met.

Livestock play a crucial role in the livelihoods of pastoral and agro-pastoral societies in the IGAD region, allowing the exploitation of drylands, where rainfall is both low and highly variable, and in turn influencing those societies towards different forms of mobility. Livestock and their products are used both directly for consumption by household and for sale to obtain cash for staple foods and other necessities of life. As the Horn of Africa rangelands remain a steady and significant source of livestock products, for which there is an ever-increasing demand within and beyond the region, it makes economic sense for national governments to encourage the retention of pastoralist skills, which have proved their adaptability and cost-effectiveness in producing valuable livestock commodities in challenging environments. If lost, these skills will be difficult and expensive to replace.

A comprehensive economic review on investment options in the Horn of Africa has recently concluded that since pastoralism is 'the dominant livelihood for the foreseeable future and potentially quite a profitable one given growing demand for livestock products, pastoralism … needs to be an important component of local and regional development strategies' (Headey et al. 2012).

Pastoral livelihoods in transition mean new types of support are needed

Pastoralists in the Horn of Africa are living through profound but varying and complex processes of livelihood transition. Recurrent droughts and famines, in the context of increased vulnerability to such shocks, have rendered many destitute and long-term dependent on food aid and poorly paid labour in villages and small towns. While many in this group aspire to re-acquire livestock and re-engage in pastoralism, there is little prospect of this happening for most of them. On the other hand, many pastoralists are increasingly engaging in an assortment of other activities that generate cash income, food resources, food security and investment opportunities (discussed in the section

entitled 'Why is livelihood diversification …').

People in the drylands of the Horn of Africa live in conditions of considerable climatic, economic and political instability, including armed conflict in some areas. As a result, families approach 'making a living' as a family enterprise in which each member—often in a wider social network such as a clan—should find a way to contribute to the common good of the family unit as a whole. Where diversification is successful reciprocal support networks result, which then offer social protection and insurance to individual family members in the inevitable times when urgent needs arise—although such support mechanisms are themselves being eroded. Pastoralists are therefore seeking and finding diverse and often new livelihood activities—some profitable and sustainable, others associated with destitution and dependency—that variously involve changes in the organization of livestock production and marketing, spatial mobility and seasonality of activities. This variety has deep implications for the way all the services considered in this Technical Brief—support to the livestock economy, support to diversification, education, human health and social protection—are conceived, designed and managed.

Continuing requirement for support to basic needs

There is a difference between 'social services' and 'basic services'. A background paper by ILRI notes that social services are designed to meet the essential needs of the entire population comprising health care, nutrition and food security, shelter, clean water and safe sanitation, personal safety, information, education and protection under the law. However, this brief focuses on a more limited set of basic services as these are defined as priorities by the responses of peoples living in the drylands of the Horn of Africa.

Pastoralists in 11 sites across northern Kenya and southern Ethiopia, both as individuals and in community discussions, have recently been asked to systematically rank their development priorities for the future: 'The basic needs of adequate water, health care, and access to education are the highest priority for people' (McPeak et al. 2012:162). This message for development agencies and donors is reinforced by the retrospective rankings given by pastoralists on the most helpful benefits of past development interventions. The researchers conclude: 'The development needs of pastoral people are basic human needs, things that are important whether one is a pastoralist or not' (McPeak et al. 2012:164).

In addition, this brief considers several other critical inputs that can be definitely considered as 'basic needs' in the context of livestock-based livelihoods in the Horn of Africa drylands. These are livestock breeds, health and feed, and milk production and processing.

Local institutional capacity in remote areas

'Traditional' socio-economic institutions among dryland inhabitants in the Horn of Africa remain fairly intact although often undermined by national and international political forces, military insurgencies or intangible but powerful pressures of modernization. However, these institutions are not always best suited to deliver or supervise the technical services that the future of successful dryland management requires. These services include human health, education—in both formal and informal modes—technical assistance to the livestock economy, and promotion of livelihood diversification.

These services, to the extent they are offered at all by government, fall to local government institutions dependent on the state and to the local representatives of technical ministries.

These state institutions face distinct problems in dryland areas:

- higher per capita costs of providing services because of low population densities, greater and more difficult distances to cover.
- limited financial resources as the drylands are remote both geographically and from the political concerns of government.
- lower levels of human resources, because limited numbers of dryland people gain educational or professional qualifications and the drylands are unpopular postings for outside civil servants.

- administrative imperatives to implement policies developed in national centres, which may be inappropriate for dryland conditions.

Administrative and political decentralization, which is now a major policy thrust in several countries of the region (for example, Kenya and Ethiopia), may address some of these problems, especially the last, but can be a mixed blessing. Because of lower population densities, decentralized or devolved governments in dryland areas may have fewer economies of scale in procuring goods and services. Decentralization can also be used as an excuse for central governments to decrease the flow of development resources in spite of the higher per capita costs and lower opportunities for local governments to collect their own revenue. Decentralized local governments can also be vulnerable to capture by elites, factions or particular communities.

What support is needed for livestock-based livelihoods?

Whose views?

Outside technical and professional opinions have had much to say on 'what is needed' for livestock in the drylands. These opinions are often aligned with and biased towards each separate technical speciality. The list is long. Thus, veterinarians argue strongly that disease control is the best way to ensure livestock productivity; livestock nutritionists claim that poor-quality feed is the most limiting factor; range management experts decry the overgrazing and degradation they see in the pastures; livestock geneticists are sure that better breeds will be more productive; water engineers stress the need to provide more reliable water points in the rangelands; social scientists are convinced that the people have no voice in determining the livestock development options; economists find that costs of technical inputs are, or are not, justified in the livestock returns; educationalists declare that more training is the key missing asset; political scientists assert that national or international policies prevent livestock development; macro-economists are sure that international trade tariffs and health regulations hinder livestock export.

Adding to the mix of expert opinions are the implementing bodies—well-funded international agencies, often UN bodies working in the Horn of Africa; small community-based NGOs; middle- and large-scale international NGOs; and again, technical and professional personnel at universities and research centres within the Horn of Africa region and further abroad. Each of these organizations also contains actors with opinions on 'what is needed'.
Finally, who is going to pay for the external support? Here the implicit as well as overtly expressed views of international donors and national governments of the Horn of Africa come squarely into play. These agencies all have wider and often conflicting political agendas on how to manage the drylands. The Horn of Africa drylands are typically in strategically sensitive areas—alongside international borders, adjoining international seaways containing security threats, the territory of ethnic groups hostile to a central government potentially or actually rich in mineral resources, and zones of inter-ethnic violence.

Those who have observed the rhetoric as well as serious investigations of 'what is needed' to support livestock-based livelihoods in Africa generally, and the Horn of Africa in this case, could be excused for being confused and consequently unsure of what is best.

One solution is to find out what the people who mainly depend on livestock in the drylands have to say about 'what is needed'. This is neither a new nor an assured method of achieving the goal of offering the best support to livestock-based livelihoods. Many factors are involved. Who is talking? Who is listening? How can people express a demand for new interventions of which they are unaware? Who is able—technically and financially—to provide the support? What are the trade-offs, costs, benefits and risks of offering one type of support versus another?

Production, including breed improvement

To increase biological output from livestock, animal scientists generally advocate improving the animal feed or the breed, improved management or a combination of inputs. However, genetic characteristics apart from output are also highly valued by animal scientists and livestock owners. These attributes may include adaptation to local climatic conditions, prolificacy, tractability, mothering ability, resistance to disease and a number of other variables (Rege 1999; Rege and Tawah 1999).

Köhler-Rollefson (2003) points out: 'The elaborate breeding strategies of pastoralists result in animals that are not only able to survive and reproduce in hostile environments but are also fairly productive under the given constraints. Because they largely present closed gene pools... these animals can be very distinct. ... Because pastoralists keep animals under conditions very close to those obtaining in the wild and without much protection against the elements and climatic extremes, their breeds may carry fitness traits of potential interest for maintaining the vitality of high-performance breeds' (Köhler-Rollefson 2003). This statement implies that livestock research still has a major role to play in identifying the important biological and economic attributes of local breeds and assisting livestock keepers in preserving these breeds.

Traits associated with herd increase are considered important in pastoral systems (Ouma et al. 2006). Cattle-keeping households in Kenya and Ethiopia have been surveyed regarding their preferences for breed characteristics and production indices. Knowledge of the characteristics, adaptability and management needs of different breeds of domestic animals and livestock-keepers' preferences concerning these traits are important in designing improvement programs (Jabbar et al. 1999). For example, a survey of pastoralist and agro-pastoralist households in southeast Kenya determined their production objectives and management strategies in order to optimize and extend a breeding program for an indigenous cattle breed. The reasons for keeping cattle and the breed or trait preferences identified reflect the multiple objectives of the livestock keepers, with both adaptive traits and productive or reproductive traits rated as important (Mwacharo and Drucker 2005).

In Sudan, a recent survey reports that the priority of camel owners for genetic improvement was for a dual-purpose animal (meat and milk production) rather than a specialized animal. However, racing ability also received some consideration (Ishag and Ahmed 2011). The serious production constraints that were defined by camel owners surveyed in Sudan include lack of feeds, disease prevalence and water shortage (Ishag and Ahmed 2011).

Rangeland productivity, fodder and supplementary feeding

Livestock production can, in principle, be supported through increased productivity of the rangelands through the cultivation of fodder crops as supplementary feeds and also through the provision (typically in times of drought) of supplementary feed from outside. To improve rangeland productivity, external advisers sometimes advocate technical methods such as soil and moisture conservation or reseeding. However, in the East African ASAL regions covered by IGAD there have been few scientifically validated results from either of these methods. A search on Web of Knowledge found 15 papers documenting the beneficial effects on crop yields of conserving soil moisture in the semi-arid areas of Kenya, Tanzania and Ethiopia, but no publications assessing the benefits on rangelands. On effects of reseeding rangelands, only one study was found, which concluded that in Kenya reseeding projects had failed and assessed the 'main factors which contribute to failures in rehabilitating denuded patches in semi-arid lands of Kenya [including] low rainfall [which is] unreliable for reseeding' (Mganga et al. 2010). Other factors: destruction by the grazing animals, pests and rodents, flash floods, poor sowing time, poor seed quality, weeds and lack of enough seed also contributed to failures of reseeding in the semi-arid lands of Kenya, according to this study.

How to improve the quality of pastoralist livestock feed sources in Africa has been a focus of research for some years (for example, see le Houerou 1979; Moris 1988), particularly at the International Livestock Research Institute (ILRI), formerly the International Livestock Centre for Africa (ILCA), which has produced detailed information, for example, on how to increase milk production through better animal feeding. The costs and benefits must be carefully assessed before recommending that pastoralist families should obtain supplementary feed for their animals to increase their milk supply. However, establishing fodder multiplication centres and developing supply chains for fodder and supplementary food might allow smoother and larger-scale interventions than targeted emergency supplementary feeding of animals.

Livestock feed supplementation has been used in drought response projects in pastoral areas of

the Horn of Africa (Sadler et al. 2009). 'Although often assumed to have inherently weak production characteristics, indigenous pastoral breeds can respond well to supplementary feeding … and indeed, livestock sourced from pastoral areas are often fattened in other areas before sale to domestic or international markets. … The challenges seem to relate more to the economics, availability and delivery of these feeds to pastoral areas rather than the inability of pastoral livestock to respond in production terms. For poorer households, there may also be affordability issues' (Sadler et al. 2009).

The effect has been assessed of small-scale interventions providing high-quality supplementary fodder to pastoralist livestock specifically to sustain access to and availability of animal milk in the household over the dry season (Sadler et al. 2012). The studies took place over a year in two pastoral areas of the Somali Region of Ethiopia. The results reveal that in sites where livestock received supplementary fodder, milk offtake improved dramatically, child consumption of animal milk increased, and child nutritional status stabilized compared with that of children in the control sites that did not receive supplementary animal feed. Moreover, the direct costs of the livestock feed interventions were found to be 45% to 75% less than those incurred through therapeutic feeding programs, and the benefits were found to extend beyond nutrition to include developmental, health and livelihoods aspects.

Animal health

Livestock production in the dryland areas of the IGAD region faces a wide range of disease challenges caused by a variety of micro-organisms, parasites and vectors.[1] There is a shortage of quantified data on these diseases although participatory epidemiological methods are increasingly deployed to harness local knowledge of diseases and their prevalence.[2] In terms of how they affect livelihoods, diseases can be broadly categorized as those that cause livestock mortality, those that limit livestock productivity, those that act as constraints on trade and those transferable to humans (zoonoses), with the proviso that some diseases may fall into more than one of these categories:

- **diseases that cause livestock mortality** include acute trypanosomiasis of cattle, *Trypanosoma evansi* of camels, contagious bovine pleuropneumonia (CBPP), anthrax, foot and mouth, and a range of diseases of small stock.
- **diseases that limit livestock productivity** include foot and mouth, chronic forms of trypanosomiasis, mastitis, and internal and external parasites.
- **diseases that act as constraints on trade** again include foot and mouth, which has a profound structural importance as the grounds for a long-standing ban on the export of meat from the region (as from other regions of Africa[3]) to the European Union, and also as grounds for occasional export bans by Egypt, and Rift Valley fever, which has served as grounds for recurrent bans on meat and livestock from the region by the Gulf states.[4]
- **diseases that are transferable to humans**, or zoonoses: examples of relevance to drylands are brucellosis transmitted through milk and other contact, and subcutaneous anthrax transmitted through handling skins.

The serious threats to livelihoods if these diseases are present require preventive and curative animal health services that are effective, affordable, sustainable and adaptable. In the economic and political context of the Horn of Africa, as in sub-Saharan African countries generally, such services are unlikely to be reliably provided by the state or by private veterinarians. Provision of clinical veterinary services by government has become a thing of the past due to constrained government finances,

[1] Besides disease, the importance of physical injury to animals and the need for its proper treatment should not be underestimated.

[2] For example, Rufael et al. 2008, Shiferaw et al. 2010.

[3] With the notable exception of Botswana and Namibia.

[4] The scientific justification for such bans remains controversial.

structural adjustment policies of the 1980s and an economic paradigm identifying veterinary services as a private good appropriate for private provision. At the same time, low population densities, lengthy distances for travel, inadequate infrastructure such as roads, and a mismatch between pastoralist ability to pay and income expectations of veterinarians make it highly unlikely that a service based on fully qualified private veterinarians can be sustainable (Peeling and Holden 2004).

Improvement in milk production and dairy product processing

A recent major review of research and development programs on milk in drylands including the Horn of Africa has noted various practical interventions that have been assessed by research aimed to increase milk supply from pastoralist livestock (Sadler et al. 2009):

- Increase the number of milking animals available to pastoralists in the lower wealth categories with little or no livestock.
- Improve the nutrition of lactating animals in seasons when animal forage is insufficient or of poor quality.
- Improve livestock health so as to increase milk supply.
- Introduce or promote different livestock species so as to prolong the seasonality of animal milk supply.
- Promote livestock species such as camels and goats that have milk of high nutritional value to humans.
- Introduce novel methods of preserving milk into less perishable forms in pastoral societies where these technologies are unknown but are used by other pastoralist societies.
- Lower the cost and increase the supply of commercially preserved milk, such as powdered, tinned and UHT milk.
- Encourage mobile livestock husbandry as it augments animal milk yield compared with sedentary livestock without access to high-quality and expensive supplementary feed.

Examples of projects to increase the availability of milking animals are the camel groups formed by Rendille and Samburu pastoral women in northern Kenya.[5]

Several strategies have been put in place to increase animal milk supply for pastoralist populations (Sadler et al. 2009). These efforts include increasing the number of milking animals, improving animal health, improving livestock feed and water, milk preservation and market-based interventions. However, while many of these interventions have been designed and implemented with explicit food security objectives, few demonstrate clear links between changes in livestock health and production or between household incomes and household food supply and consumption. However, there is evidence that veterinary care improves pastoral food security when delivered during non-drought periods while approaches such as commercial destocking, supplementation of livestock feed and feed banks have benefit as drought response measures.

Interventions that support commercial dairying (or sale of milk) hold promise for improving the livelihood security of pastoralist households. However, such strategies need to be aware of potential negative outcomes for poorer households such as reduced milk production and higher calf mortality due to increased levels of milk offtake and reduced mobility.

[5] www.thesamburuproject.org/about/http://kenyasomali.blogspot.co.uk/2010/12/gum-and-camel-milk-factory-in-wajir-to.html

Why is livelihood diversification also important for long-term development and resilience building in the drylands?

Why do pastoralists and agro-pastoralists diversify?

Livelihood diversification among pastoralists is pursued for diverse reasons. Among many pastoralist groups in the Horn of Africa, diversifying is not new and has been combined historically with pastoral mobility. It is a form of risk management on a continuum with risk management within livestock production through mobility and flexible offtake strategies (COMESA 2009). However, diversification is now also bound up with sedentarization (Fratkin 2012; Livingstone and Ruhindi 2012)—both forced sedentarization from loss of access to grazing lands and drought-related destitution, and proactive sedentarization to grasp new economic opportunities. In fact, for a long time in the Horn of Africa there have not been many 'pure pastoralists' who rely solely on livestock. Diversifying to seek supplementary income sources and spread risk by engaging in non-livestock activities is therefore not new for producers in this region.

More generally, diversifying has been seen in a demographic context (Sandford 2006). The argument runs that traditional pastoralism requires certain numbers of livestock relative to human population. Human population in pastoral systems is growing and in the absence of increased rangeland productivity to sustain larger numbers of livestock, pastoralists need either to diversify to activities not dependent on range-based livestock or engage in outmigration. By this view, pastoralism can only become less viable and diversifying and migrating can only intensify in the future. Critics of this argument stress the adaptive capacity of pastoralism, including the capacity to gain higher incomes from livestock through more efficient and more specialized marketing, but they also accept the reality of different processes of diversifying. One way of conceptualizing these processes is the fourfold scheme of 'hanging on' to largely traditional pastoralism, 'stepping up' to more commercialized livestock production, 'branching out' into supplementary non-livestock-based activities, or 'moving away' completely out of pastoralism (HPG 2010). The last option is one of increased poverty, vulnerability and dependence on food aid. By either view, these processes will have profound implications for mobility, settlement and the growth of small towns in drylands, and therefore for the clientele, designing and managing government services and development projects.

Empirically, there are many varied livelihood activities that pastoralists use either to complement or to exit pastoralism. Special mention must be given to both rainfed and irrigated cropping: the boundaries among pastoralists, agro-pastoralists and mixed farmers in many areas are becoming ever more hazy, and many pastoralists in the wetter parts or irrigated valleys of the Horn of Africa have combined livestock production with crop agriculture. Other forms of diversifying:

- labour migration away from pastoral areas, often involving low-income, low-status occupations such as working as night watchmen, although some pastoralists or ex-pastoralists get better employment.
- employment or self-employment in small towns in pastoral areas: manual work, services such as tailoring, petty trade, hauling goods.
- working for other pastoralists as herders or in specialized niches such as collecting particular feed materials.
- processing and selling dairy products.

- collecting and producing natural resource products from rangelands: some products of high value such as gums, resins and honey others, like charcoal, of low value for the labour involved and associated with environmental degradation.
- fishing and collecting marine products.
- relatively new ventures that encompass commercial honey production, eco-tourism, growing flowers and vegetables, and raiding animals 'on commission' for wealthy outsiders.
- for a few better-off pastoralists, investing in profitable enterprise such as trade, lorry transport or real estate.

These activities can be categorized in several ways to help to understand them better:

- location: in the rangelands, in small towns nearby, in more distant cities even outside Horn of Africa countries, i.e. the Gulf states or further afield.
- whether the occupations are likely to be followed by men, women or both.
- levels of income: very low, low, medium and high—all relative to other income opportunities in the region.
- occupational security: whether the income stream is reasonably guaranteed.
- requirement for capital investment (start-up costs).
- requirement for skills training or formal education.
- environmental sustainability: low for commodities such as charcoal.
- relation to pastoralism: an activity dependent on livestock production, a supplement to livestock production, a temporary strategy to restock and move back into pastoralism, or a process of dropping out of pastoralism.
- dependence on pastoral demand: diversified activities that supply goods and services to pastoralists (such as supplying fodder or veterinary services) that are vulnerable to crashes in the pastoral system in the way that collecting and producing non-pastoral goods such as resins, or out-migration, are not.

It has been proposed that diversifying away from pastoralism will most likely involve both the poorest pastoralists pushed into low-income, unskilled occupations by destitution, and the wealthiest pastoralists who are pulled by alternative ways of investing wealth earned through livestock (see Little et al. 2001; Radeny et al. 2008; Homewood et al. 2009). 'Middle pastoralists' are more likely to concentrate on herding and avoid either strategy. The truth of such a hypothesis is likely to be locally specific. For example, it appears not to be true for the Afar of Ethiopia where the likelihood of a household having a non-pastoral income source declines linearly with herd size (Negussie et al. 2005).

Importance of alternative income to households

The expansion of pastoralist livelihood options has resulted from pastoralists' immediate needs, but also from their demands for greater wealth and income security, leading to spontaneous responses to new opportunities. Thus, as droughts, disease, land loss or conflict continue to reduce herds, pastoralists have looked for other ways to make up the losses and to supplement their income while alternatives have also become more available and in some instances, more attractive than only tending livestock. It is therefore no longer appropriate to consider only how livestock-based livelihoods can be strengthened when pastoralists themselves have expressed interest in adding to their portfolio of livelihood choices.

Given the 'diversity of diversification processes' outlined above, quantifying the contribution of non-livestock income to pastoral households will be subject to major variability across and within communities. Data from six ecologically and ethnically varied sites in northern Kenya (McPeak and Little 2005) give the shares in household cash income from different activities (Table 1).

Overall, cash income from non-livestock sources (53%) exceeds that from livestock sources. But the aggregate figures conceal a significant variation among the sites. Also, the cash income figures

ACTIVITY	HOUSEHOLD INCOME (%)
Livestock sales	34
Salaries	18
Trading revenue	16
Wage labour	10
Milk sales	8
Firewood/charcoal sales	5
Hide and skin sales	5
Cultivation	2
Craft sales	1
Water sales	1
Total income	100

Table 1. Cash income sources for households in northern Kenya

Source: McPeak and Little (2005)

do not include direct consumption of livestock products, notably milk, which once given an imputed monetary value is seen to be significant, but again varies markedly among sites at anything between 25% and 175% equivalence of cash expenditure.

This set of findings does not include food aid as a long-term item of consumption or remittances from family members inside or outside pastoralism, but depending on which livelihood pathway within or out of pastoralism is being followed these too will be both significant and highly variable across communities.

Connections between diversification and livestock production

The relations between diversification, livestock production and sedentarization are complex. Some forms of diversification can 'allow herders access to new sources of income and value that complement pastoralism, and can stem the movement of herders to towns and settlements' (Little et al. 2009). These forms include niche activities within the livestock economy, but also forms of cultivation that accord with local resource management and seasonal migratory calendars.

A cross-sectional study was conducted in southern Kenya drylands to estimate incomes from both livestock and crops, which demonstrated their complementarity and the farmers' risk-averse livelihood diversification strategy. Cost of inputs and value of income were significantly associated with profit from either crop or livestock production enterprises. This study revealed that livestock production still remains the major source of livelihood in Kajiado District compared with crop production. While reducing the cost of keeping livestock could increase profit for large-scale pastoralists and reducing the cost of crop production could increase profit for small-scale pastoralists, medium-scale pastoralists could exploit the complementarity of crop and livestock production to harness existing opportunities to generate significant wealth and achieve food security (Maichomo et al. 2009).

Other activities erode either the environment in general (charcoal making, fuelwood collection) or the livelihood opportunities of other pastoralists (cultivating within enclosures). Yet other activities, as practised by those recently exited from pastoralism, are simply insufficient to accumulate money and animals to return to herding, however, much these may be a motivation for those practising them.

But all these links need to be viewed in the light of flows of resources between those focusing on livestock production and those working outside the livestock economy, and flows of cash, labour, animal products and animals on loan. These flows make use of complex links within extended households and across households. Even in contexts of destitution and sedentarization, the distinctions between herders and diversifiers are hazier than they appear.

Why is sustainable service provision important to building long-term resilience in the drylands?

Education

Access to meaningful education is just as much a human right for the children of the drylands as it is for anyone, but providing education in drylands creates particular opportunities and faces particular challenges. There is an opportunity, first, for using education to end the political and cultural marginalization of dryland dwellers by equipping children (and through adult and civic education, today's adults) to have a say in the policies and institutions that affect them. There is also an opportunity to use education as the long-term driver of livelihood diversification (Little et al. 2009). A range of distinct challenges have arguably sometimes been confused:

- to provide education that is compatible with mobility
- to provide education that is compatible with low population density [6]
- to provide education that is compatible with children participating in and acquiring skills for dryland livestock production and agriculture
- to provide education that does not culturally alienate children with negative messages about their own livelihoods
- to provide decent and secure schools that will not deter children from attending [7]

Different authors stress various lists of these challenges. Krätli (2001) has emphasized the alienating effect of much of the education provided in pastoral areas delivered by teachers of non-pastoral backgrounds and following national curricula. By contrast, Little et al. (2009) have demonstrated the effectiveness of education as provided under the mainstream Kenyan national system on salaried employment and the ability to cope with drought (without recourse to food aid).

Indicators of educational participation and achievement are consistently lower among children of mobile pastoralist communities than the relevant national averages (Table 2).

Table 2. Gross enrolment ratios (GER) for primary education in selected IGAD countries

COUNTRY	NATIONAL GER FOR PRIMARY EDUCATION, 1999–2001 (%)	GER FOR PRIMARY EDUCATION FOR SELECTED NOMADIC AREAS (%)
Djibouti	33.6	11.4
Eritrea	52.2	15.5
Ethiopia	57.4	10.6
Kenya	87.6	12.9
Tanzania	76.0	8.4

Source: Adapted from Carr-Hill and Peart (2005:61). See original for dates, definitions of primary school age ranges, and details of nomadic study areas. Uganda national GER was 137%, indicating large numbers of children enrolled in primary school from outside the national primary age-range, but figures for nomadic areas were unavailable.

[6] For the distinction between these two, see Sandford (1978).

[7] This includes the need to make schools 'conflict resistant' (Reidy 2012), for example, by providing facilities for children to stay through vacations.

For each of the countries, the gross enrolment ratio (GER) for the nomadic study areas was less than half the national ratio, indicating an inability of governments to match in the nomadic areas their achievements elsewhere. In addition, there is a gender aspect: not only is the GER for girls in pastoralist communities less than that for boys, but the disparity between boys' and girls' GERs is generally greater than in settled communities. There is little evidence that the overall picture or the gender disparity has improved at any scale above that of pilot projects since then. In addition, as participation in secondary and post-secondary education grows among non-pastoral communities, pastoralists must keep up if they are to use education for diversification and resilience, and donors and governments must raise their sights above a sole focus on primary education.

Health and sanitation

Similar considerations apply in health—distance from national centres, low population densities and general marginalization create issues in providing health services to all dryland dwellers—but mobile pastoralists face specific challenges. One indication of poor provision is the rates for measles vaccination coverage: 33% in pastoral areas of Kenya compared with 72% nationally, and 28% in pastoral areas of Ethiopia compared with 66% nationally. There are similar differentials in the vaccination coverage for other childhood diseases (Ali and Hobson 2009).

As Zinnstag et al. (2006) state, 'the health status of nomadic communities or populations [worldwide] is usually poor'. There are conflicting views on whether there is a systematic difference between the patterns of diseases suffered by pastoralists and by sedentary people (Downie 2011), but typical problems include TB, acute respiratory and gastrointestinal infections, vaccine-preventable diseases, sexually transmitted infections and parasites (Schelling et al. 2005), zoonoses such as brucellosis, and diseases transmitted in surface water (Downie 2011). Pastoralists suffer poor levels of maternal and infant health, and some pastoral populations suffer severe malnutrition, especially severe wasting typical of periodic food crises, but there is no general answer to whether these are worse or better than national averages.[8]

Remoteness, low population density, pastoral mobility and poor infrastructure are constraints to delivering both curative and preventive health services, especially those intensive of professional supervision such as directly observed treatment short courses (DOTS—the preferred treatment for TB) (Cohen 2005). Health services can be delivered through either fixed or mobile clinics, but in either case there may be barriers of 'mistrust, low perception of health priorities by nomads and preference for traditional medicines/treatments' (Zinsstag et al. 2006). There remain serious knowledge gaps on the prevalence of HIV in pastoral communities, the broader livelihood impact (Morton 2006) and the best ways to overcome barriers in delivering antiretroviral therapy to pastoralists.

Social protection, safety nets and insurance

Even with strengthened policy to support natural resources management and the livestock economy, recurrent drought will still have the potential to cause loss of livestock through mortality or forced sale, and to erode livelihoods. Traditional customs of livestock gifts or loans between households helped manage these crises in the past, but their effectiveness has been diminished by more market-oriented relations and by the sheer scale of droughts and vulnerability to them. In recent decades droughts have been dealt with primarily through emergency food relief, mainly provided by international donors. Recent years have seen increasing interest in alternative approaches through different forms of social protection and insurance. Indeed, social protection is now seen as a 'basic service' alongside health and education.

Devereux and Tibbo (2012) point out that social protection approaches, experience of which has been gained far more in smallholder farming and urban settings, need both to be adapted to the

[8] REGLAP (2010) with rather limited data, shows infant mortality rates in pastoral areas of Kenya and Ethiopia to be slightly better than the respective national averages. Devereux (2006) shows great and complex variation between pastoral and non-pastoral regions of Ethiopia in terms of evidence of chronic and acute malnutrition.

context of pastoralism and to recognize the different forms of vulnerability within pastoral areas. The most important experiences to date have been the construction of so-called safety nets—programs that guarantee poor or impoverished households either direct cash or food transfers or the opportunity to work for wages on public works projects. Such programs with predictable transfers aim to meet basic food needs and prevent depletion of household assets by giving poor people the space to plan and to make positive decisions to improve their livelihoods in the face of stress. For governments, they have the advantage of decreasing their dependence on annual appeals for international donor funding.

A related but more speculative approach is that of insurance, specifically index-based insurance of either livestock or crops, which gets round the difficulties associated with traditional insurance schemes with individual loss adjustment, now being piloted by ILRI and partners in Kenya (ILRI 2012).

Best practice interventions

Criteria for supporting best practices

A useful and up-to-date discussion of best practices for human health, education, food security and social protection in the Horn of Africa is contained in the review of UNICEF good practice and lessons learned from six countries: Djibouti, Eritrea, Ethiopia, Kenya, Somalia and Uganda (Downie 2011). This review also extends to best practices for health and education in other pastoralist and dryland regions of the world, including Mongolia and Iran. Nevertheless, this review found little empirical evidence or independent evaluation of the impacts, costs and benefits of the various practices implemented by UNICEF or other agencies.

Our review of best practices is guided by three criteria: first, whether the practices are technically successful; second, whether they are economically justified; and third, whether they are feasible under foreseeable institutional and political conditions. Thus we have concentrated mainly on those interventions 1) that have been independently evaluated as to whether the approach is meeting its objectives, 2) where benefits–costs have been measured, and 3) for which options realistically exist for scaling up, given constraints of funding, national government support and security risks. Many proven good results from small-scale projects have not been adopted by the relevant government departments in this region (as elsewhere) due to lack of political will (apathy) or, more actively, due to rivalry between government departments for access to domestic revenue and external funding.

'Basic services support' means that some institutions have to offer the basic services. One of the crucial questions in planning and prioritizing basic service interventions is to determine which institutions have shown they are most capable of providing the services most needed in the ASAL regions of the Horn of Africa at an affordable and competitive cost. A number of such institutions already provide basic services in the ASAL regions of the IGAD countries: these include government line ministries (for example, education, health, veterinary, water, electricity, roads, postal), community-based NGOs, large international NGOs, donor-funded projects and programs and, increasingly, the private sector.
The role of the private sector is often discussed in terms of providing public and private goods. It is now acknowledged that the private sector should have a key role in supplying certain private goods such as clinical veterinary care, artificial insemination services and mobile phone services. But even with public goods like agricultural information or preventive veterinary health or services whose provision should be a basic human right, like health or education, there may still be a key role for the private sector in delivering under contract goods or services financed by the government (or by donors if government is unable to do so).

Both small- and large-scale commercial businesses have a growing active presence in the ASAL regions of the Horn of Africa. Not reliant on short-term donor funding horizons, not confined by shifts in the development aims of donors or NGOs, not limited by government regulations and personnel hiring processes, the private sector is willing to take more risks if there is a perceived gain and always has to provide a service that people want but also crucially can pay for while maintaining operational efficiency. For these reasons, the private sector is arguably best positioned to take on a greater role in delivering some basic services to rural and urban inhabitants of the Horn of Africa region.

Unlike many government departments or NGOs represented in remote ASAL regions, members of the private sector are motivated to offer goods and services to the population, as they are

financially rewarded when their goods and services are accepted. Again, unlike many government departments or NGOs operating in these regions, private businesses cannot afford to carry too many unproductive workers. Commercial operations here must be staffed by people who know their business, as failure has a real and often immediate cost. Again, this is in contrast to many government and non-government organizations. Nimble and responsive to emerging disasters as well as opportunities, the private sector has shown that it can provide some, but by no means all, essential goods and services when and where they are most needed. The caveat to all this, of course, is in the cases where required services do not yield a financial return. The 'public good' is then at stake. It is in providing unprofitable services that the role of national governments, NGOs and international agencies that support them becomes inevitable.

Put another way, national governments and their supporters should seek ways of relinquishing responsibilities for service delivery in cases where these services can be profitably, effectively and equitably delivered by the private sector. This would have the added advantage of releasing funds, personnel and planning attention for national governments to concentrate on providing essential but unprofitable services that are much needed for the public good.

Aimed at supporting livestock-based livelihoods

The section above 'Addressing the problem and challenges…' identified several areas where dryland dwellers in the Horn of Africa need support to strengthen livestock-based livelihoods. There is now a significant body of experience on the most effective ways to support animal health.

Training, mobilizing and supporting CAHWs has entered the mainstream of responses to the animal health problems outlined in that section—not just problems of disease but of stretched, unaffordable or non-existent services. The term CAHW covers a variety of institutional models and workers so designated to carry out a range of veterinary functions (Catley et al. 2004). The African Union/Interafrican Bureau for Animal Resources (2003) defines a CAHW as anyone carrying out a limited range of veterinary functions (whoever employs them), but most of those mobilizing CAHWs or writing about them stress 1) community participation in identifying problems and selecting candidates for training, and 2) long-term financial sustainability through recovering costs from pastoralists. Mainstream opinion now tends to see CAHWs as part of the private sector (Peeling and Holden 2004). A specific model of CAHWs allied with private veterinary businesses, where the latter are operated by staff with animal health assistant or similar qualifications, is increasingly seen as best practice as long as government veterinarians can provide overall supervision and regulation. Pastoralists are usually willing to pay for 'a more expensive private service that actually addresses their principal veterinary needs' (Catley et al. 2004). CAHW programs represent 'a powerful and cost-effective instrument' for addressing the challenges of poverty, failed government services and misuse of medicines (Peeling and Holden 2004). Catley et al. (2004) present quantified evidence of positive consequences of CAHW programs in terms of livestock keeper satisfaction, household livestock holdings, livestock mortality, household income and milk consumption, in some cases with rigorous with or without comparisons for countries including Ethiopia, Kenya and South Sudan. They also present evidence that properly trained CAHWs are technically competent and able to make proper diagnoses.

They conclude:

> *Actual field experience from privatized CAHW systems clearly shows that these approaches are cost-effective, supported by livestock-keepers and can be based on complementary relationships among CAHWs, other para-veterinary professionals and veterinarians. (Catley et al. 2004).*

CAHW programs require support by proper policies for regulation, supervision and training, as detailed in the section below 'Key challenges for development'.

Aimed at supporting alternative livelihoods

The consensus is that in the long run education is the most effective path to livelihood diversification (Little et al. 2009; McPeak et al. 2012) and this

is discussed in the next section. There is also new evidence that more direct external support to diversification is of relatively low priority for pastoralists. 'While [surveyed pastoralists] are interested in alternative income sources, they see education as the path to alternatives rather than local training in making mats or jewellery, which has been the most common alternative income-generating project experienced in this area. … Our findings suggest that there is less desire for donors and development agencies to support innovative and non-traditional livelihoods than there is for a focus on familiar, direct improvements to living conditions based on improved health, education and water services delivery.' (McPeak et al. 2012:163–166).

There may be niches for shorter-term and more direct support to alternative livelihoods, but there does not seem to have been an accumulation of good practice in efforts to stimulate diversification. Livelihood opportunities and the best instruments to promote them are likely to be locally specific. In some areas, it may be possible to adapt well-established measures such as promoting cooperatives, vocational training, microfinance or measures to promote economic growth in small towns to the realities of pastoral areas. Elsewhere, new instruments may be needed. Everywhere, identifying new opportunities will need both good participatory diagnoses of supply and local market chains and hard-headed analyses of demand from end markets, be they domestic or export.

Crop agriculture, both rainfed and irrigated, is a specific and important alternative livelihood, which has been increasingly practised by pastoralists and ex-pastoralists in the Horn of Africa and also continues to be heavily promoted by governments. Within the drylands of the Horn of Africa, there are large-scale plans as well as actions to convert this riverine land on the Nile, Tana, Omo, Jubba-Shebelle and Awash systems to irrigated crop agriculture, usually with commercial investment from foreign companies or foreign governments, for example, in Kenya's Tana River area (Nunow 2012).

Governments of some Horn of Africa countries are expropriating pastoralists' dry season grazing land and bulldozing the valleys in pursuit of a 'policy of modernizing agriculture by displacing mobile livestock production in favour of irrigated crop agriculture' (Behnke and Kerven 2012:58). Such policies must carefully consider costs, benefits and equity. Headey et al. (2012) conclude that irrigated agriculture in dryland zones yields higher income than pastoralism, but an in-depth empirical assessment of the costs and benefits of irrigated commercial agriculture versus continuation of mobile pastoralism, in the case of the Awash Valley of northern Ethiopia, found that contrary to widely held expectations, the pastoralist system yielded economic returns per hectare that were equal or greater than state-subsidized irrigated plantations of low-value crops of cotton and sugar (Behnke and Kerven 2012). Additionally, even researchers sympathetic to promoting irrigated agriculture note its limited capacity to absorb pastoral populations (Headey et al. 2012) and the need for assured markets for high-value crops, such as vegetables or flowers (BurnSilver 2009). The spontaneous adoption of these new economic activities in Kenya's southern Maasailand suggests that irrigated horticulture can be viewed by dryland inhabitants (as well as outside investors) as a profitable income source (Homewood et al. 2009).

There is a trend for harvesting and selling natural products from the Horn of Africa drylands. Wren and Speranza (2010) analysed the impacts of four different bio-enterprise initiatives on agro-pastoral livelihoods and on improved natural resources management (NRM) in the drylands of Kenya. One of the key findings is that diversifying into enterprises requires cooperation among the stakeholders with their varying experiences in development, NRM and business development. In addition to support in human, financial, social, physical and natural capital, mentoring is another crucial factor for success. Gachathi and Eriksen (2011) investigated the potential of collecting plant gums and resins for livelihood diversification in Kenya's drylands. This research found that many households—including poor people, women and children—currently collect and sell plant gums and resins as an alternative to livestock production. However, incomes are relatively low and several factors constrain the activity.

Aimed at improving provision of and access to basic services

The Horn of Africa region is the scene of a significant initiative on pastoral education jointly organized by the ministries of Northern Kenya and of Education

(Siele et al. 2012). The initiative aims to confront the problems associated with former models of educating pastoralists: problems of mobility and remoteness, but most of all the problem of physically separating children in schools from the herding lifestyle, forcing parents into a choice between their children acquiring formal education or acquiring skills for pastoral production and survival. Institutionally, this will involve creating a national commission on nomadic education in Kenya with a mandate to formulate policies, mobilize funds, create mechanisms for coordination and evaluation across districts and ministries, and establish skills. It will also require special training for teachers and preferential recruitment of teachers from pastoral backgrounds who speak pastoral languages. The learning approach will be based on distance learning through innovative use of radio—current Kenya Broadcasting Corporation channels, newly available digital frequencies and possibly in future, satellite broadcasting and the cellphone network. Students and adults from pastoralist households will attend a one-week induction course, be given a receiving and playback device for the audio units and be instructed in its use. Thereafter, they will proceed at their own pace, receiving further material through radio to be backed up by visits from teachers.

There are various effective programs for delivering human health services, curative and preventive, in the drylands of the Horn of Africa. Downie (2011) discusses approaches using traditional birth attendants, child health days in Somalia, and insecticide-treated nets in Karamoja, Uganda. A more fundamental departure from established models has been piloted and documented outside the Horn of Africa, in Chad; it involves collaboration between human and animal health services (Schelling et al. 2005). Child vaccination campaigns were carried out among three ethnic groups, with varying degrees of collaboration and resource sharing with veterinary vaccination campaigns. Where activities were conducted jointly, take-up of human vaccination and its cost-effectiveness were higher. The conclusion was that, for vaccination at least, and possibly for epidemiological surveillance, greater collaboration between the services was feasible and could be incorporated into national policy, although complementary shifts will be needed in medical and veterinary training, and in joint planning.

As regards social protection services, there have been positive experiences with safety net approaches in countries of the Horn of Africa. While the Productive Safety Net Programme in Ethiopia has achieved significant impact with a scheme of labour-intensive works to regularize and make more predictable the external assistance to nearly eight million people, better links are needed with other programs to ensure the chronically poor 'graduate' into food security (RHVP 2007). Questions remain on how the approach can be rolled out from highland to pastoral areas. In Kenya the Hunger Safety Net Programme has been piloted in four northern districts by the Ministry of Development of Northern Kenya and Other Arid Lands, starting in August 2007. Payments started in February 2009 and by August 2011, 68,000 households were receiving regular cash transfers, above the target set. Beneficiaries are identified as chronically poor by virtue of

- **Community-based targeting -** communities are charged with determining who qualifies to receive payment, focusing on chronic rather than acute hunger.
- **Age -** targets people who have reached a certain age irrespective of wealth, status or gender. Every elderly person in a particular locality will be targeted.
- **High-dependency ratio** - focuses on poor families with a high ratio of small children, the aged and the disabled.

Payments are made unconditionally through an innovative system involving shopkeepers as local agents for banks and the new technologies of smart cards and electronic transfer of funds—technologies that can be rolled out beyond safety nets to emergency relief (Devereux and Tibbo 2012). Sophisticated monitoring and evaluation, including randomly assigning sublocations to different payment modes, has been written into the program from the beginning.

Safety nets in both Kenya and Ethiopia have given priority to providing cash over food, justified by the multiplier effects of cash through local trade, agriculture and employment, and by the greater choice left to people in how to use the assistance received. However, the food price crisis in 2008 raised the question of whether safety nets based on

cash transfers could cope with high price volatility; beneficiaries in Ethiopia seemed to be shifting to a preference for transfers in the form of food (ALNAP [no date]; Sabates-Wheeler and Devereux 2010). The question of cash versus food transfers needs careful consideration.

Appropriate models of index-based livestock insurance (IBLI) have become better understood through research and needs assessment and have now been piloted in northern Kenya by a consortium including ILRI. IBLI has particular value as a safety net for the 'vulnerable non-poor' among the pastoral population. This group can be prevented from falling over a threshold of livestock holdings per household[9] below which their chances of rebuilding a pastoral livelihood are slim; it is much less likely to be of value to the poor, who are already below such a threshold. But equally importantly, by decreasing the risk of livestock losses to drought IBLI can 'crowd in' improvements in livestock productivity either by providing credit more attractive to external agencies or by increasing livestock keepers' own willingness to invest in new technologies (Chantarat et al. 2010, 2012).

Index-based insurance, in this case based on NDVI (normalized difference vegetation index)—a standard means of measuring rangeland productivity by remote sensing—solves problems of moral hazard, adverse selection and transaction costs that make traditional insurance with individual loss adjustment unfeasible in pastoral contexts. A pilot scheme on this basis was launched in Marsabit District in January 2010, and the first pay-outs were made in October–November 2011. Independent evaluation (Carter and Janzen 2012) found that insured households were less likely than their uninsured neighbours to have coped with drought in ways that eroded their livelihoods or were otherwise undesirable (selling livestock, relying on food aid, reducing the number of meals eaten each day) and anticipated relying less on such strategies in the future.[10] Both the ex ante assessment and the evaluation point to the potential for scaling up IBLI.

The challenge of educating pastoralists on the value of a new institution such as insurance can be met through simulation games and other forms of extension, and the challenge of delivering prompt payment can be met through new electronic payment systems spreading through northern Kenya and already used in safety net programs. However, further questions remain on how much variability there should be among premiums offered by insurers in different areas and across seasons, and whether pastoralists' willingness to pay for insurance will include typical commercial mark-ups by insurance companies over actuarially fair rates (Chantarat et al. 2010, 2012).

[9] In East Africa this threshold has been identified as 8–16 tropical livestock units (head of cattle or equivalent in other stock) per household.

[10] See Carter and Janzen (2012) for an explanation of how their method controls for ex ante differences between insured and uninsured households.

Key challenges for research

Supporting livestock-based livelihoods

As Headey et al. (2012) observe, the most recent drought has sharpened divisions between those who see pastoralism as no longer sustainable and those who seek to protect it: 'yet despite these very contrasting views on economic development in the region, very little research directly addresses this big picture question of where public resources should be invested'. We discuss here key challenges for further research that will directly address policy choices on investment.

Rebalancing country focus of research

Table 3 highlights the overall challenge facing research on pastoral livelihoods in the Horn of Africa: the need to geographically rebalance where research effort and funding are concentrated. Table 3 characterizes the relative size of pastoral populations and the economic importance of livestock production in five of the IGAD East African countries. Relative importance of pastoralism is reasonably clear: Sudan (Sudan and South Sudan combined) and Somalia contain the bulk of the region's pastoralists and produce most of the region's livestock output. The combined pastoral populations of the three remaining countries—Ethiopia, Kenya and Uganda—are approximately equal to the number of pastoralists in Somalia and fewer than the number in Sudan. In economic terms, the combined output of livestock in Ethiopia, Kenya and Uganda is slightly less than 60% of the output of Sudan alone.

The preponderance of work on pastoral production and pastoral livelihoods does not reflect the relative regional importance of pastoralism in different Horn of Africa countries. The epicentre of research interest on pastoral livelihoods and production systems is Kenya; next is Ethiopia, Recent work on pastoralism in Somalia, Sudan and Uganda focuses on conflict, insecurity and land rights, or (in Somalia) on the livestock trade. Research on these topics reflects their current importance in these particular countries as well as the difficulties of conducting long-term programs of household-level research in

Table 3. Economic importance of livestock and size of pastoral populations in eastern Africa (in US dollar terms)

COUNTRY	VALUE ADDED BY LIVESTOCK (USD BILLIONS IN 2009)	LIVESTOCK-DEPENDENT HUMAN POPULATIONS (MILLIONS IN 2000)
Ethiopia	3.668	5.1
Kenya	4.124	1.6
Somalia	no estimate	7.4
Sudan	14.525	8.2
Uganda	0.527	0.7

Sources: Livestock GDP estimates from IGAD 201a,b; IGAD 2012a,b; Thornton et al. 2002 for human population estimates. The figures on livestock's contribution to national GDP do not distinguish between pastoral and non-pastoral production, and the human population figures do not refer to pastoralists per se, but to the number of people residing in regions where extensive grazing of natural pastures is the predominant form of livestock production.

insecure areas. Nonetheless, what we know about pastoral livelihoods in the Horn of Africa needs to become more geographically balanced and donors need to support this rebalancing as soon as security conditions permit.

Conserving and improving indigenous livestock breeds

To conserve the endangered indigenous livestock breeds raised by pastoralists in the Horn of Africa, researchers have recommended and in a few cases established breeding schemes. Local breeds have important ecological and economic roles in being highly adapted to semi-arid environmental conditions, having production parameters valued by producers, for example, milk supply for a long period, tolerance to drought and restricted water, and ability to withstand seasonal nutritional stress. Research–pastoralist partnerships for studying and conserving indigenous livestock breeds can address several constraints, 'e.g. individual herds are small and use of pastures is communal, or water makes controlled mating difficult. Such interventions would require the full participation of the livestock keepers as well as ensuring that a holistic approach to species and breed attributes is taken into account in setting breeding goals' (Mwacharo and Drucker 2005), such that the complete array of contributions that livestock make to livelihoods and the genetic characteristics related to these contributions are fully included in new programs.

Sudan and South Sudan possess the largest population of cattle in Africa, mainly kept by pastoralists. The cattle are broadly classified into Nilotic types and North Sudan zebu cattle including Kenana and Butana (Rofaah), which possess good potential for milk production in comparison with other ecotypes of North Sudan zebu; Nilotic cattle breeds are poor milkers, probably for genetic reasons (Rahman 2007). Research efforts should be supported to conserve and upgrade these key indigenous breeds in which genetic characteristics of great value have already been identified by pastoralists or researchers.

Considering heterogeneity within population segments provides a framework for adapting breeding policy interventions to specific producer segments by integrating preferred traits in a breed improvement program (Ouma et al. 2006).

Livestock nutrition for milking animals, peri-urban and trade livestock

A specific area that merits more research attention is the question of livestock nutrition, particularly for milking animals, which are crucial for maintaining human nutritional welfare in the drylands, and for livestock, which are increasingly restricted to grazing around growing settlements in the drylands. Cultivating improved fodder or collecting native grasses either for domestic use (in peri-urban dairy operations) or for sale (to support trade cattle) are some of the principal uses to which the relatively recent peri-urban range enclosures are put (as discussed in the following subsection). Improved fodder legumes have been tested in East Africa since the early 1900s as protein supplements but there were few cases of widespread adoption a decade ago (Sumberg 2002). Fodder shrub species are currently available for the highlands (altitude 1200–2000 m) where their uptake has been encouraging, but few are available for semi-arid areas (Franzel and Wambugu 2007).

Supporting alternative livelihoods

There is an urgent need for research on several aspects of diversification and related topics, such as pastoral–small town links and remittances, with the overall aim of finding ways to identify opportunities to diversify that allow sustainable and dignified livelihoods.

Little systematic research has been done into the key questions:

- Which pastoralists diversify (in terms of gender, wealth, education and other factors)?
- What are the relative roles of 'pull' factors towards new occupations and 'push' factors away from the strains of pastoralism?
- What impact has diversification made on well-being?
- How can beneficial forms of diversification be supported in both the short term and the long term?

- How are remittances and other resource flows to home communities maintained, and can they be facilitated by better institutions and policies?

Wren and Speranza (2010) note that bio-enterprise activities are gaining increasing interest, but still there is little empirical evidence of their impact. For such enterprises to defend their market niches, the quantity and quality of the product are critical.

Supporting provision of social services

The principal knowledge need on delivery of human services is on the effectiveness of different approaches and institutional set-ups. Much of this can be covered by careful monitoring, evaluation and lesson learning from pilots and new initiatives such as those discussed in the section and subsection 'Best practice interventions: Aimed at supporting alternative livelihoods'. The links among different approaches to educational provision, diversification, drought resilience and well-being need to be researched, preferably using longitudinal research approaches.

In human health, important research gaps remain on the impact of zoonotic diseases on humans and how to counter them, and on the prevalence of HIV and AIDS among pastoralists and the appropriate responses for preventing, treating and mitigating impacts on livelihoods (Morton 2006).

Different approaches to social protection, including safety nets of various kinds, public works and employment guarantee schemes and insurance also need to be the subject of ongoing monitoring and impact assessment transitioning into longitudinal research and examining impacts on diversification, drought resilience and well-being.

Key challenges for development

Supporting livestock-based livelihoods

Animal health: phytosanitary compliance and livestock quarantine systems

The development of animal health delivery systems based on CAHWs is one of the notable research and implementation successes of the past decades. These systems must continue to be scaled up and put on a more sustainable footing through links to the private sector. At the same time, policy and legal frameworks need to be established that guarantee the right for veterinary personnel at a range of different levels of training—from CAHWs to fully qualified vets—to practise in appropriate circumstances and with appropriate supervision.

An emerging challenge is the design of disease control systems for trade animals that cross international borders. The current disease control and marketing arrangements are under threat from increasingly expensive and exacting food and animal health standards in importing countries, as well as from international competitors prepared to meet those standards. Trade embargos based on livestock health concerns exact a heavy cost on producers and traders dependent on livestock marketing for basic food items and income. One measure in response will be lobbying to establish systems of commodity-based trade in livestock products to replace systems based on the livestock disease status of areas of origin. The pathways for Horn of Africa countries to agree on this, and otherwise respond to new trends in global livestock product markets, merit further intraregional and international negotiation.

Conserving indigenous livestock breeds

Sub-Saharan Africa is home to a total of 145 cattle breeds and strains: of these, 47 (about 32%) were considered to be at risk of extinction in the late 1990s (Rege 1999). The geographical distribution of breeds provides evidence that pastoralism is associated with a relatively high degree of animal genetic diversity. Peripheral and remote areas—the typical habitat of pastoralists—have been noted to have disproportionately large numbers of breeds. Community projects for conserving animal breeds can be conducted according to the same principles that are applied to other resources.

Rege (2003) notes that 'to the extent that conservation of agricultural diversity needs to be linked to utilization, and given that the concept of breeds as aggregate or "package" of traits is a manifestation of the environment and community values and goals, breeds represent the single most important unit of analysis in the context of conservation and use of livestock diversity'.

Equitable distribution of tourism and wildlife conservation revenues

In many Horn of Africa countries the institutions that manage wildlife and govern conservation areas are dysfunctional from the perspective of both rural development and nature conservation. In Kenya, for example, the institutions that safeguard wildlife have overseen a 60–70% decline in the populations of large mammal wildlife since records began in 1977 (Norton-Griffiths 2007).

At the same time most rural residents have not profited financially from wildlife-based tourism, an outcome that 'runs directly counter to current donor-encouraged, community-based conservation orthodoxy, creating a major gap between rhetoric and reality' (Homewood et al. 2009:11). In Ethiopia, the expansion of national parks has transformed pastoralists into trespassers on their own land (Turton 2002). How to break the current impasse between wildlife and livestock interests and how to effectively recompense rural residents who live with wildlife is unclear (Homewood et al. 2012). Policy-

relevant research and negotiation on these topics is a matter of urgency (Niamir-Fuller et al. 2012).

Enclosures and the intensification of peri-urban and wetland livestock production systems

Privatizing and converting wetland resources in dryland areas to more intensive forms of land use is an ongoing process (Woodhouse 2003; Behnke 2008). Similar patterns of enclosure and rapidly evolving systems of land use have been documented in peri-urban rangeland areas and in the vicinity of livestock markets and transit points. Support to these spontaneous emerging income streams would include providing appropriate infrastructure on a cost-sharing basis, giving micro-credit and technical advice on suitable fodder crops, and recognizing institutions that allocate and regulate land.

Supporting alternative livelihoods

Because of the specificity of interventions to support alternative livelihoods among localities, genders and categories of pastoralists and ex-pastoralists, diversifying may be best promoted in the near future through small projects by NGOs and others. Such projects could be funded through existing schemes and challenge funds operated by donors. However, it will be important to document and disseminate lessons from such pilots; so far, there is a lack of accumulated documentation of good practice in efforts to stimulate diversification. In the longer term, larger programs and policies that promote livelihood diversification, most notably providing education, can be designed.

Supporting social service provision

Delivering health and education services to pastoralists and other dryland dwellers requires new thinking on organizational models—distance learning in education and delivering joint human–animal health services—and lesson-learning from the pilots that are implemented. Likewise, social protection for pastoralists needs new thinking and not a simple transfer of approaches (such as public works programs) used in sedentary areas. But arguably, like other development challenges in the drylands, these programs require political will to recognize the needs and the rights of dryland dwellers and work for solutions that are equitable, and not merely cost-effective, in delivery.

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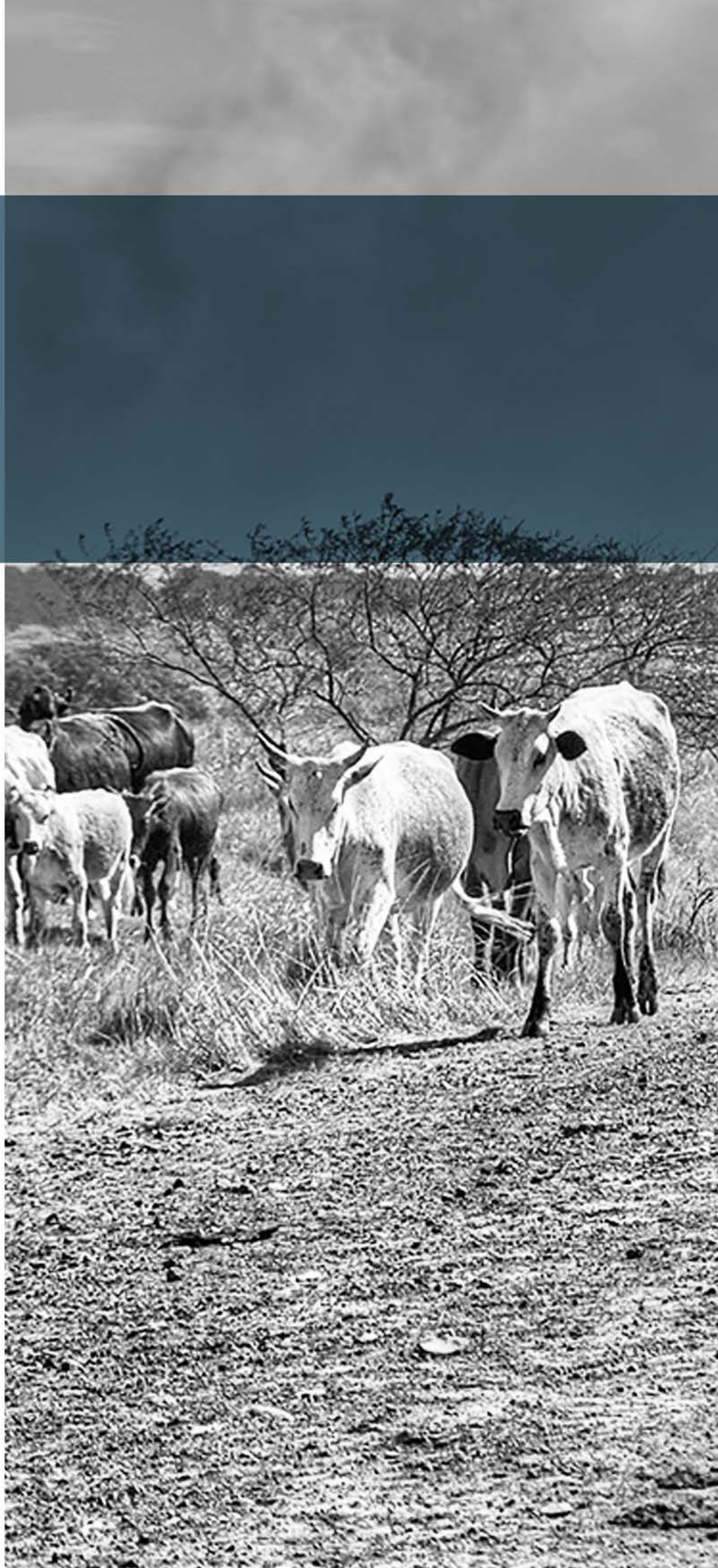

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