Market access and trade issues affecting the drylands in the Horn of Africa

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technical consortium

Building Resilience in the Horn of Africa

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BRIEF 2

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Abbreviations

ASAL	arid and semi-arid land
AU-IBAR	African Union–Interafrican Bureau for Animal Resources
COMESA	Common Market for Eastern and Southern Africa
DRC	Democratic Republic of the Congo
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FMD	foot and mouth disease
IGAD	Intergovernmental Authority for Development
LEGS	Livestock Emergency Guidelines and Standards
NGO	non-government organization
OIE	World Organization for Animal Health (Office International des Epizooties)
SPS	sanitary and phytosanitary

Terms

TERM	COUNTRY
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
East African Community	Burundi, Kenya, Rwanda, Tanzania, Uganda
Greater Horn of Africa (eastern 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 brief addresses the rationale and priorities for investments in trade in livestock and other agricultural commodities such as market development and access, cross-border trade, and sanitary, phytosanitary and food safety standards, to build resilience in the drylands.

It should be noted at the outset that livestock trade functions reasonably well in the Intergovernmental Authority for Development (IGAD) countries. As shown by the impressive growth in the volume and value of trade in livestock and animal products in the region since 2001, markets are functioning reasonably well. A rough estimate is that trade in livestock and livestock products in the IGAD countries (Djibouti, Eritrea, Ethiopia, Kenya, Somalia, South Sudan, Sudan) equals USD 1 billion or more in foreign exchange in many years, and probably 5–6 times that amount in local currencies. Live animal and meat exports, especially from Ethiopia, Somalia/Somaliland and Sudan, have increased rapidly as has domestic trade centred on key urban markets such as Addis Ababa, Khartoum, Mombasa and Nairobi. Much of what we suggest in this brief describes actions that can be taken to ensure that producers in the lowlands of the Horn benefit from growing trade opportunities.

We list best practice examples of markets and market agents who successfully adapt to new opportunities and changes, most of which occurred during the past 10 years:

- leasing of Kenyan coastal ranches by traders to fatten animals for large urban and export markets.
- development of numerous small and large feedlots in highland Ethiopia for export and domestic urban markets.
- development of vibrant cross-border markets along the Ethiopia/Sudan, Somalia/Kenya and Kenya/Ethiopia borderlands.
- development of camel export trade to Sudan, Egypt and the Middle East, and the extent to which Ethiopian traders have responded by sourcing animals across borders as far away as interior northeastern Kenya.
- use of mobile phone technologies to transmit market information—mainly among traders but also increasingly among herders.
- 'graduation' of former bush markets to a new status as important secondary markets in southern Ethiopia in response to the growing demand for livestock.
- development of women's groups in southern Ethiopia that buy and sell small stock for the meat export trade.
- development of mid-highlands camel markets in Ethiopia and the rapid response by traders to this new opportunity.
- 'graduation' of Boran pastoral groups in southern Ethiopia to larger-scale traders.

Key challenges are reconciling marketing objectives with the production goals of pastoral producers, who hold a larger share of female animals than male in their herds given their production objectives; increasing competition for the natural resources used in pastoral production by other alternative uses; dealing with livestock diseases and related market quarantines; and overcoming a lack of value-adding techniques in the lowland production sector. Land tenure, production and marketing issues are three interrelated priority areas that support trade from the lowland areas of the region. However, it is often difficult to address policies for one challenge without referring to the other two and we suggest

integrating the policies that work in all three domains. We suggest policies by topic.

For mobility regionally, we suggest ratifying a regional agreement that allows pastoral communities safe passage across borders for grazing and similar purposes to promote the peaceful coexistence of communities straddling borders and to minimize conflicts. At the national level, we suggest demarcating dry season grazing reserves and mobility corridors legalized by appropriate title deeds (as is the case with farmlands) to protect such areas from being acquired by outsiders and to ensure the safe passage of pastoralists; returning grazing reserves acquisitioned by individuals through illegal means to the rightful owner communities to foster livestock productivity; and where huge tracts of grazing land have been taken for large-scale irrigation schemes or where such new projects seem to be inevitable due to 'national priorities', ascertaining that an enabling policy ensuring fodder production is incorporated in such projects to compensate pastoralists for the loss of grazing land, and ensuring that corridors are established to allow watering rights for livestock. Locally, we encourage empowering local authorities to protect demarcated grazing reserves and mobility corridors, and ensuring the safe passage, including cross-border movements, of different pastoral communities, as the need arises.

For pastoral production regionally, we suggest creating policies to coordinate and harmonize disease prevention and control programs across the IGAD region; developing a regional veterinary protocol in which simultaneous vaccinations take place for transboundary disease control, including during outbreaks, in border areas to make the effort effective and minimize recurrence of diseases; and ratifying an agreement and developing a mechanism to minimize cross-border conflicts, including controlling illegal arms, to avoid unnecessary loss of human life and destruction of property. Nationally, policies are needed for:

- allocating sufficient resources for the sector to provide appropriate parallel services as for farmers (training, extension, research) along with providing robust veterinary services to reduce unnecessary livestock mortalities.
- exploring ways in which livestock can be used as collateral to alleviate short-term cash needs of pastoralists, including providing credit to poor pastoralists to restock.
- providing credit to animal health workers and livestock feed retailers to avail such services in close proximity, and to pastoral groups to promote value-adding practices to boost productivity and raise household income per animal unit.
- promoting the production of fodder crops in riverine areas both for value adding and for reducing drought-related mortalities to increase the overall economic productivity.
- devising a national strategy to minimize the effects of emergencies as and when they happen through allocating contingency funds, for example, pre-positioning feed stock and support to livestock offtake through providing credit and logistics to minimize large-scale mortalities in cases of protracted droughts.

Locally, we show a need for alerting national authorities about imminent shocks for appropriate timely responses; facilitating producer access to government-supported services to increase livestock productivity and avoid unnecessary losses; facilitating or coordinating the disbursement of loans to relevant groups and individuals, and monitoring their usage and impact; coordinating transboundary disease vaccination with cross-border counterparts for effective results; and coordinating with cross-border counterparts to minimize conflicts.

Concerning livestock marketing, we suggest a regional agreement among neighbouring countries with the necessary provisions to let pastoralists sell livestock across the border without restrictions—the Common Market for Eastern and Southern Africa (COMESA) or IGAD could be the appropriate institutional mechanism for achieving this—and a regional agreement that specifies the sanitary and phytosanitary requirements for cross-border livestock trade. Nationally we suggest:

- putting a nationally binding system in place in which traded livestock are taxed once at the point of origin to avoid unnecessary multiple taxation and increase the income of pastoralists; traders take the future taxation into account when offering herders low prices.

- allowing pastoralists to sell livestock across nearby international borders to meet their basic needs in cases where alternative internal markets are non-existent or unattractive; the solution is to provide alternative attractive markets rather than restrict producers' selling options.
- providing credit services to livestock traders to enable them to pay pastoralists in cash rather than on credit, which results in deferred or no payments at all.
- providing loans to promote the acquisition and use of designated livestock trucks to ensure the safe arrival of livestock at destinations.
- constructing rural and tertiary roads in lowland areas to facilitate the movement of livestock and other commodities.
- setting up cattle slaughter and processing provisions with appropriate deboning and adequate freezing capacities in strategic locations.
- providing suitable refrigerated container carrier trucks to transport frozen beef from abattoirs to ports.
- promoting adequate refrigerated docking facilities in the region's key livestock trade ports (Mombasa, Berbera, Bosasso, Djibouti and Port Sudan), to maintain the cold chain within the recommended optimum temperature until shipments are loaded onto vessels.

Finally, at the local level we suggest ensuring that livestock taxed at the original point of sale are not taxed again at subsequent stages, and allowing pastoralists to sell at cross-border markets without restriction.

Background and introduction

Livestock production is critically important in the IGAD (Intergovernmental Authority for Development) region. This region is part of the Greater Horn of Africa, which includes the countries of Djibouti, Eritrea, Ethiopia, Kenya, Somalia, South Sudan, Sudan, Tanzania and Uganda. Figure 1 uses FAOStat 2010 data to illustrate the magnitude of livestock production in the region. The data are from 2010 and thus prior to the independence of South Sudan.

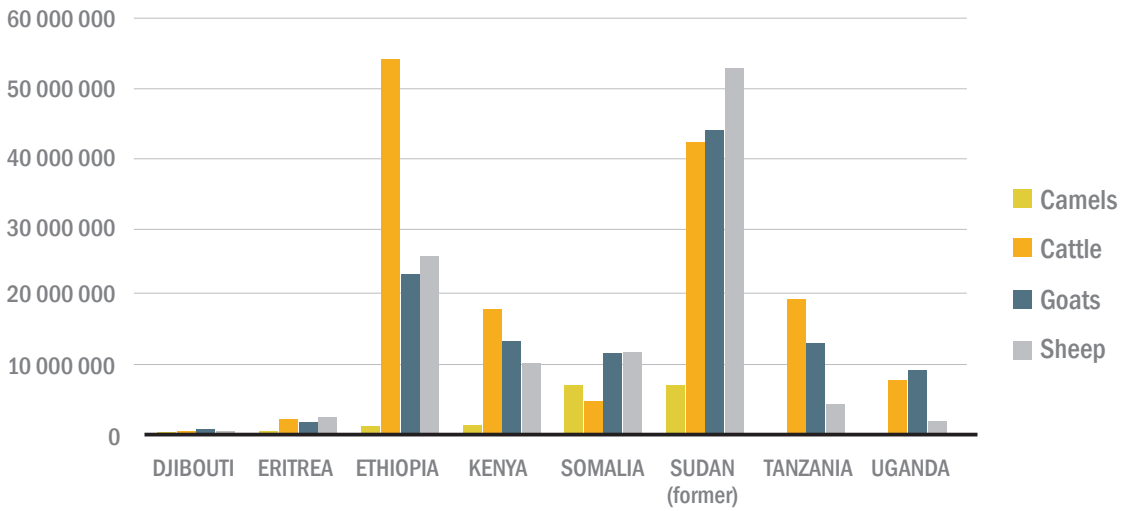
Livestock production in the IGAD countries takes place from the most arid regions (< 150 mm of rainfall per year) to higher potential areas where rainfed cultivation is practised. Since rainfall in the region generally correlates with altitude, with 'highlands' being higher rainfall and 'lowlands' being lower rainfall areas, the terms lowlands, drylands and arid and semi-arid lands (ASALs) are used interchangeably in this brief. Most livestock production in these countries that is traded takes place in the lowlands. Since the dry areas are predominantly populated by pastoralist and agro-pastoralist populations, the focus of this document is on lowland trading and production systems.

Trade is integral to the livelihoods of ASAL residents, partly due to the simple fact that lowland pastoral production systems are not self-sufficient without recourse to markets. Livestock keepers of the lowlands need to purchase foods and other essential commodities to survive, especially in dry seasons when herd productivity and animal-sourced foods (especially dairy products) are low. Therefore, livestock producers in dry environments have been engaged with markets—either through cash sales and purchases or barter—since well before the 20th century.

Importance of markets and trade to sustainable livelihoods in the lowlands

Several studies demonstrate that the market conversion of live animals and animal products (milk) into cereals and other agricultural products yields higher kilocalorie (energy) returns than if livestock and livestock products are consumed by producers directly (Little 1992; Dietz et al. 2001; McPeak et al. 2011). In most years, therefore, pastoralists do

Figure 1. FAOStat livestock population of IGAD countries, number of heads, 2010.



better in energy terms by selling some animals and purchasing cereals and other agricultural products. Cash demands for food and other needs—for example, education fees and medical expenses—often are critical variables in determining herder sales. With the exception of unusually severe droughts, the caloric terms of trade almost always favour animal owners, who can usually obtain two or more times more food energy by selling livestock and purchasing agricultural products than by relying on direct consumption of pastoralist products such as milk and meat. By using the market for sales and food purchases, a pastoralist household is able to keep a smaller, more sustainable herd than would otherwise be the case. With per capita animal ownership decreasing in the region, especially in the past 15 years, pastoralists and agro-pastoralists increasingly are dependent on the market to meet dietary and other needs.

Livelihood diversification is a key means for sustaining pastoral livelihoods; access to markets plays a key role in supporting this diversification. Here we are not referring to diversification as a means for exiting livestock production, though we note that adopting non-livestock income-generating strategies is frequently implemented as an ex post coping mechanism. We stress diversification as a means to support livestock production by allowing herders to better manage risk through diversifying activities and investments. For example, herders depend on selling animals to finance initial investments in trade and education, while ensuing revenues from non-livestock activities can support pastoralism. Considerable evidence shows the degree to which diversified livelihoods and investments can assist pastoralists to sustain their livestock-based economies, especially during droughts and other shocks (see Little et al. 2001; Little 2009b). Cash earned from livestock trade, farming and other non-herding activities not only facilitates livelihood diversification, it also finances purchases of veterinary medicines, school fees and, increasingly, feed and fodder to support pastoralist production.

In addition, in higher rainfall areas or in locations where irrigation is possible, lowland producers can pursue cultivation both as a means to diversify their reliance on livestock-based incomes and to reduce their dependence on the market for food purchases. Although cropping in many lowland zones in the IGAD region is risky with crop failures in as many as two to three years out of five, increasingly it remains a popular diversification strategy, especially among poor herders. Irrigated cultivation is pursued by wealthier lowland residents as a form of investment that helps to support livestock production, especially where fodder crops and grasses are grown (see Little et al. 2001; Little 2009b).

Who benefits from the different markets? This question is crucial in terms of distribution and equity concerns, as well as market access. Most evidence points to the fact that benefits from the most selective and highest-value markets, such as the overseas export trade, are captured by large traders and better-off livestock owners (Little 2003; Aklilu and Catley 2009). Poor and middle-scale herders and traders often have minimal access to the export sector. Less-demanding markets, in terms of product or animal specification and capital outlay, include local domestic markets and regional cross-border outlets, and these encourage greater participation by middle-wealth livestock owners and traders. The poorest quartile of herders, in turn, hardly participates in the livestock trade. As a tool to alleviate poverty, they are more likely to be involved as hired workers in the trade, such as trekkers and loaders or petty traders around market centres, than as sellers of live animals. Market participation and access is more inclusive for small stock (goats and sheep) than for cattle and camel trades, since poorer households (especially female-headed units) have a higher proportion of small stock in their holdings than better-off pastoralists, and small stock trade requires less cash outlay to purchase and sell than other species.

For milk trade in the drylands, which is concentrated near towns, there is greater involvement of poorer herders, especially women, than there generally is for live animal trade. However, opportunities for dairy trade in the drylands (especially commerce in cow milk and butter) are limited mainly to urban and peri-urban areas where consumers are available and distance to markets is minimal. Most lowland species of cattle are not high-volume milk producers and, coupled with the lack of infrastructure (including electricity and refrigeration) and large urban markets, constrain the development of vibrant milk markets such as those found in the Kenyan and Ethiopian highlands. An interesting exception may be trade in camel milk (a product that stores

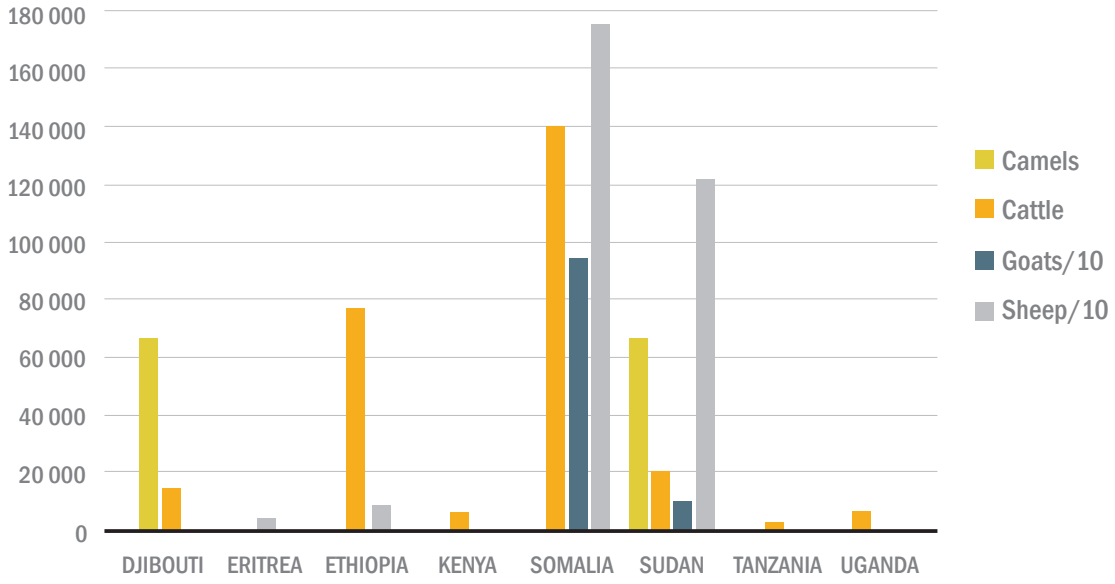


Figure 2. FAOStat live animal export data, number of head, 2009.

better and longer than cow milk), which is growing in certain IGAD countries, especially Kenya, Somalia and Sudan. However, it still is mainly a niche market in the region, favoured by town-based Somali and other populations where camels historically and culturally have been important.

Overall, evidence from northern Kenya, southern Ethiopia (McPeak et al. 2011), Darfur and Kordofan (Young et al. 2005) illustrates that livestock marketing is an economic activity that cuts across different livelihood groups (including agro-pastoralists and farmers); thus, improving livestock markets is among the most promising and positive options for the greatest number of households. An important goal of this brief is to outline steps that can be taken to achieve this goal.

Analysis of current status of marketing opportunities, national and cross-border trade in livestock and other commodities; critical gaps in support of market growth and expansion

Livestock trade in the Horn of Africa has experienced considerable changes in the past 10 years (for overviews, see Aklilu 2002, 2008; Agrisystems Limited 2003; AU-IBAR and NEPDP 2006; McPeak and Little 2006; Gebremehdhin et al. 2007; Legese et al. 2008; Farmer 2010; Farmer and Mbwika 2012). Live animal and meat exports have recently increased dramatically (see Figure 2 based on 2009 FAOStat data; note goats and sheep numbers are divided by 10 for scaling purposes). Exports from Djibouti, Ethiopia, Somalia/Somaliland and Sudan have increased rapidly as has domestic trade centred on key urban markets such as Addis Ababa, Khartoum, Mombasa and Nairobi. Despite impressive gains in live animal exports from Ethiopia during 2005–2010 where they reached more than 240,000 in 2010, Sudan and Somalia overwhelmingly remain the key exporters of live animals in the region. Together they account for more than 90% of total regional livestock exports, especially of goats and sheep. Relative to most IGAD countries, Eritrea, Kenya, Tanzania and Uganda export very few animals (< 5000 animals in most years in the case of Kenya).

Ethiopia has made impressive gains recently in meat exports (Figure 3) and in 2010 exported USD 63 million worth of meat products, mainly goat meat (SPS/Texas A&M 2011). In 2009 Sudan exported USD 8.8 million worth, mainly of sheep meat. Somalia recorded a negligible amount of meat product exports (2009 data FAOStat). In contrast to these countries, live animal and meat exports have played a very minor role as a share of Kenya's overall exports. Historically, the value of meat exports has been less than 0.5% of the country's total export value in most years. However, Kenya has made gains in recent years with meat exports. The volume (including pork) increased 11-fold during 2005–2010. Meat exports rose to 2500 metric tonnes in 2010 (Farmer and Mbwika 2012). However, it

is worth noting that up to 25–30% of the volume of meat exports from Kenya likely is from animals sourced from neighbouring countries via informal cross-border trade since the Kenyan market is highly dependent on supplies from the surrounding region. One final salient fact is that in these country cases the overwhelming majority – 90% or more – of animal and animal products destined for export trade originate in the pastoral lowlands.

As incomes and size of the middle class throughout the IGAD region have grown in the past five years, so has the consumption of animal products. One estimate is that current per capita red meat consumption in Kenya is 15–16 kg and in Ethiopia 12–13 kg (Behnke and Kerven 2011; Farmer and Mbwika 2012:1). According to some estimates, the Kenya figure represents an increase of more than 20% since 2006 (Behnke and Kerven 2011:6). Another indicator of increased demand is the fact that meat prices for the most select cuts of meat now are as high as USD 11 per kilogram in Nairobi, and USD 9 per kilogram in Addis Ababa (see Farmer 2010; Farmer and Mbwika 2012). One

Figure 3. FAOStat meat export estimates in tonnes, 2009.

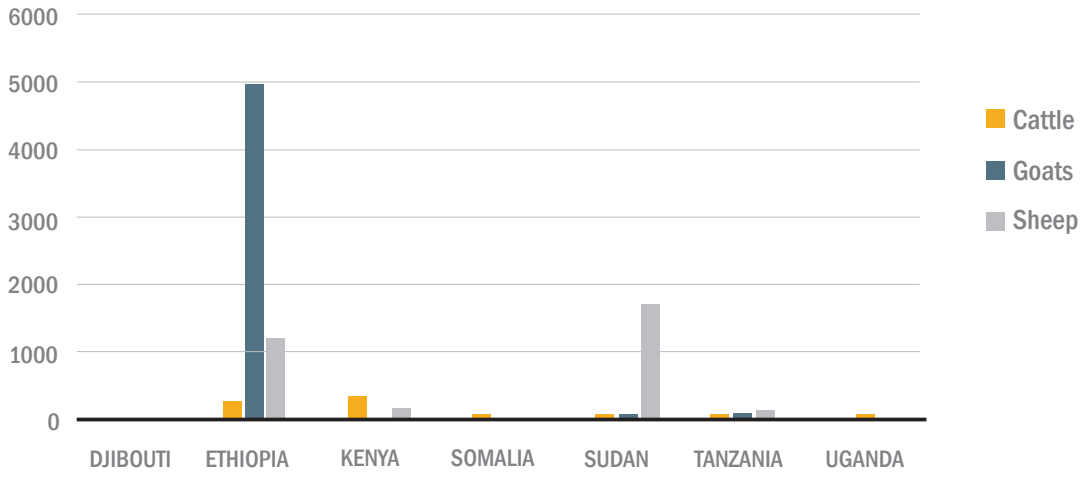
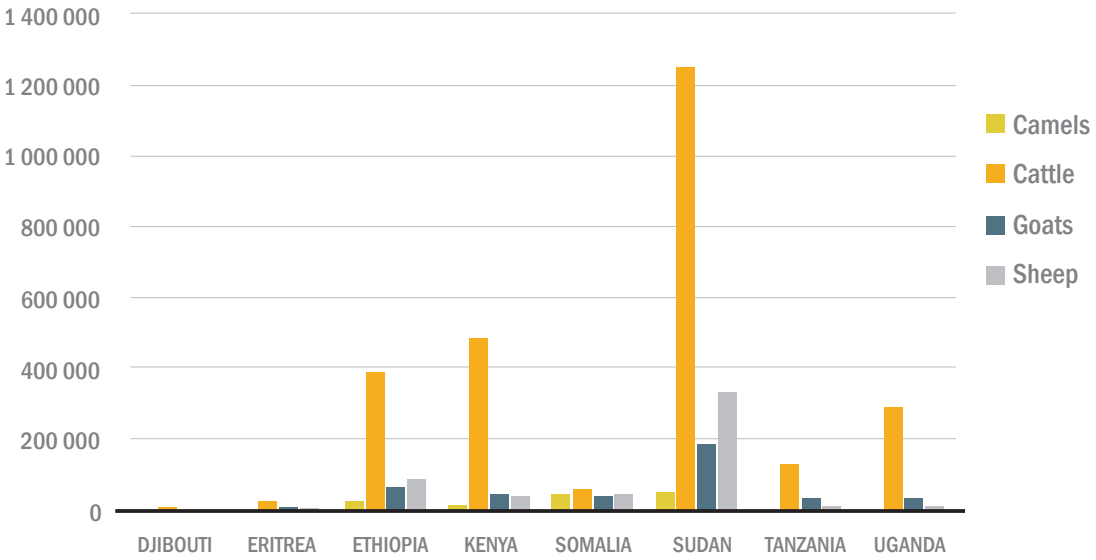


Figure 4. FAOStat meat production estimates, in tonnes, 2009.



estimate is that domestic trade in Kenya accounts for more than 98% of total livestock trade in the country, including exports (Farmer and Mbwika 2012). In Ethiopia domestic trade and consumption also account for the vast majority of the country's livestock market in the country (Little et al. 2010). There are no comparable figures available for Sudan or Somalia on domestic trade and consumption, but local markets and consumption would account for a lower proportion of total trade in those countries because of the high volume of their export trade. For Ethiopia with a population in excess of 80 million people, domestic trade is likely to account for more than 90% of livestock and meat trade in the country. (See Figure 4 for FAOStat 2009 estimates of meat production.)

Opportunities for growth in livestock and agricultural trade nationally and regionally

The export trade in meat and live animals continues to be an important source of foreign exchange and export earnings, especially in Sudan, Ethiopia and Somalia (particularly in Somaliland and Puntland). Also, this trade is among the most volatile due to international competition and periodic bans resulting from animal health issues, especially periodic outbreaks of foot and mouth disease (FMD) and Rift Valley fever. Domestic and regional trade remain less risky and have considerable potential for growth as incomes and urbanization in the region increase.

In countries with the largest populations and cities, such as Ethiopia and Kenya, a stratified market system already exists whereby animals are fattened on ranches (Kenya) near towns, and on small and large feedlots (Ethiopia) for both the domestic and the export trade. The development of stratified marketing systems in the IGAD region has been considerable in the past decade; these systems need to be better understood, including the types of investments that could improve them. For example, what steps could be taken to locate some of the fattening and holding areas and feedlots near or even within lowland areas, rather than always relying on those in the highlands or near major cities? This strategy could increase value-added potential in livestock production and generate needed employment in lowland areas.

In regional terms, there is considerable potential for growth in meat exports in future. This is especially true for exports to the Democratic Republic of the Congo (DRC) and Uganda. Again, it is worth noting that Kenya's import and export markets are positioned to grow. Kenya is only about 70–75% self-sufficient in meat. As noted earlier, informal exports of animals from Tanzania, Ethiopia and Somalia help Kenya meet its national demand. In contrast, there have been minor air shipments of meat from the Horn (including Kenya) to the DRC and the Central African Republic, and sea shipments to Mauritius and Comoros and other meat-deficit countries. Considerable potential for growth exists for both import and export trade in the region, especially with projected improvements in roads and other infrastructure. The strategies that each country will need to pursue to balance trade flows in this sector will require coherence in terms of live animal imports and exports, improvement of quality in value addition, location of slaughtering facilities, and the characteristics and demands of the targeted market.

Nonetheless, given the existing demand for meat imports by other African countries, the overall potential for increasing trade from the countries in the Horn of Africa to other countries on the continent remains significant. For example, in 2005, central, North and West African countries imported 18,000 t of fresh and chilled beef and 328,000 t of frozen bone-in and boneless beef from India, Brazil and Argentina. Egypt alone imported 103,661 t of frozen liver and 4265 t of frozen offal from the United States while central and West Africa imported 56,000 t of frozen offal from Argentina. South Africa, Mauritius, Ghana, central and West Africa also imported 36,000 t of frozen mutton from New Zealand and Australia in the same year. This huge market potential provides opportunities to expand trade within the continent if the regional countries with livestock surplus can compete on price, sustain supplies, delivery schedule and quality. Rich et al. (2009) argued that high feed costs and other constraints made international meat exports from one key IGAD exporter, Ethiopia, non-competitive with other key global meat exporters such as Brazil, Argentina and India. More recent market analysis needs to be conducted to ascertain the competiveness of IGAD countries for regional meat markets in Africa.

Social-political challenges to strengthening markets and trade

The drylands continue to suffer from policy and investment biases based on poor understanding of their economic potential, the dominance by outsider interests and investment agendas, and imposed policies and programs that are often inconsistent with local economic and environmental realities and priorities. Experience in the region with strengthening lowland policy lobbying through national pastoral parliamentary groups has, to date, had mixed results. The political challenges in the drylands are exemplified in a number of specific areas and issues, which are discussed below.

Policy dimensions: cross-border trade regulation, sanitary, phytosanitary and food safety standards, foreign investments

Other than domestic trade within national boundaries, the largest volume and value in trade continues to be regional cross-border trade (Little 2009a). In some very important cases, cross-border trade strongly figures into export trade, as in the case of small stock exports from Somaliland and Puntland where an estimated 65% of animals are sourced across the border from eastern Ethiopia. Policies towards cross-border trade still treat the activity as economically marginal and illegal, often resulting in their random and punitive enforcement on traders and producers alike, including confiscating livestock and food products from merchants. At present the vastness of the region and the lack of infrastructure at the borders between neighbouring countries make it unfeasible to try to stop or control this trade. Market forces also are at play, and when cross-border prices are better than domestic prices there is a natural tendency for agents to seek the best option.

It should also be acknowledged that the revenues and transport expenses associated with unofficial cross-border livestock commerce also finance local food purchases and imports that are badly needed in lowland border areas. Numerous studies show what happens to local food security when cross-border animal trade is halted through punitive policies (Aherns 1998; Nin Pratt et al. 2005; Devereux 2006; Little 2006, 2008). Not only does it raise the price of local foodstuffs and lower livestock prices in the borderlands, but border closures often require costly imports of food aid to make up for shortages and to meet local hunger needs (COMESA/CAADP 2009).

There continues to be a glaring disconnect between trade policies and land-use and land-tenure policies in the lowlands. Although the pastoral lowlands provide the great majority (> 90%) of tradable livestock and livestock products in the region, most IGAD governments pursue policies that favour alternative (non-livestock) land-use activities and alternatives to existing tenure systems, including advocating private land titling or leasing productive riverine or dry season grazing lands for cultivation and conservation. Governments in the region recently have opened up large tracts of pastoral lowlands, especially in key river valleys and better-watered areas, for foreign investment in irrigation and dryland farming and in wildlife conservation and tourism schemes.

With a few exceptions, measures to ensure that herders continue to have access to dry season water, transit and grazing zones have not been adequately considered. Nor has there been consideration of what incentives and extension support could be developed to encourage irrigated fodder production in these investment ventures that could support livestock production. This kind of production would, at least partially, compensate for loss of pastures for livestock production as well as support the feed

needs of livestock markets. As will be discussed later in the paper, numerous benefits can accrue through producing fodder in lowland areas near to key livestock production zones.

Animal health and disease concerns

Kenya remains the only country in the region that still does not officially recognize community animal health workers (CAHWs). These para-professionals have played important roles in Sudan and Ethiopia by providing veterinary services in remote pastoral lowlands, including for eradicating rinderpest and other deadly diseases.

Although different livestock markets have different animal health requirements, CAHWs could play a role in helping producers and traders address these challenges. Among the most stringent are those for the export trade to the European Community. At present Kenya is considering introducing a disease-free zone around the central highlands or rangelands, which eventually might allow it to export livestock products to European Community countries. The country has not been cleared to export livestock to Europe since the 1960s, and only South Africa, Namibia and Botswana in sub-Saharan Africa have disease-free zones that allow them to export to these markets. Little et al. (2010) considered the social, economic and ecological effects of imposing disease-free zones in neighbouring Ethiopia and concluded that they did not see 'the creation of "disease-free zones", with their very high costs and implementation and management problems, as a strategy for improving livestock trade in Ethiopia during the next 10–15 years or so' (Little et al. 2010:28). Even in the case of Botswana, imposing a disease-free corridor has come at very high economic, ecological and social costs, and large annual subsidies from Botswana's government are required to sustain it.

An alternative to disease-free zones that has received considerable attention is the commodity-based approach to animal product exports. Here, the key is to ensure that exported products meet stringent sanitary and phytosanitary (SPS) requirements. Also, there are recent concerns about animal product traceability, and these measures could be conducted more easily from ranch and farms than from open-range grazing systems like those in the lowlands. Different importing countries have different SPS requirements to ensure safe products are delivered to their citizens, and meat factories are required to comply with these requirements to sell to specific markets—for example, Saudi Arabia or the United Arab Emirates. This approach would build on the existing meat export trade from the Horn to the Middle East and other African countries, but add further processing steps to open up new export markets that are currently closed to trade from the Horn.

This approach faces one significant challenge: the quarantine and port facilities at two of the region's major ports used by live animal export traders—Djibouti and Berbera—are owned by Saudi Arabian companies, which are primarily engaged in livestock exports. In the case of Djibouti, Ethiopian exporters complain of high charges and inefficiencies. Contrary to international norms, these livestock trading companies are also engaged in regulatory functions, such as issuing animal health certificates. The recent outbreak of FMD in Egypt from animals that have passed through these quarantine centres indicates the fundamental flaws in this arrangement. As a result of this outbreak, Egypt has recently imposed a ban on live animal imports from Ethiopia.

Unless these underlying problems at these quarantine centres are addressed, there will likely be future trade restrictions and loss of access to international markets rather than the desired growth of access to international markets. And with the establishment of a port near Lamu in Kenya and supporting transport links to this port, it is likely that Ethiopian animal exports from the south of the country will eventually transit through the new port. Improvements on roads and other infrastructure on both the Ethiopian and the Kenyan sides are beginning in anticipation of the port and the impact it will have on commerce in the region, and plans for the port itself are in the final stages. There is a new opportunity for quarantine centres near Lamu, if appropriate investments are made and regional agreements are reached, that will allow animals to meet SPS requirements of countries to which Kenya currently is unable to export meat.

Infrastructure

Market infrastructure, especially fenced-off auction yards with watering facilities, has been a favourite investment by donors and governments in the region, but its impact on livestock trade often has been minimal. There are cases where improved market yards and loading facilities for animals sold at the market have proved to be beneficial, but this has not always been the case. A recent study shows that their benefit to traders and herders in terms of reduced transaction costs and higher sales volume and prices is limited, which means that careful analyses need to be conducted before investing in specific market infrastructure (Aklilu and Catley 2009). In fact, traders and sellers often avoid new market facilities because of the higher taxes and fees that are charged with new infrastructure. Instead, they are often found outside of new and expensive market facilities transacting their business.

Road infrastructure can stimulate trade and reduce transaction costs for both producers and traders. Throughout the Horn, important livestock markets are found near primary and secondary roads. Such infrastructure raises commercial activities generally, rather than livestock trade only. Most of the lowlands have poor road and transport infrastructure. Tertiary herd-to-market roads also would be beneficial for trade for small farms, especially in providing market access to remote production areas. Traders frequently lament the fact they often cannot move their trucks to producer areas, while livestock owners complain that traders and their trucks (lorries) never reach their areas—which forces them to trek long distances to town-based markets.

Another trade-related, transport infrastructure issue involves the use of general-purpose lorries to transport livestock. While these lorries are sturdy and carry both imports such as grains and other goods into lowland areas and livestock animal exports out, they are not ideal for moving livestock. Animals lose condition, are often injured and are in some cases killed in the shifting mass of livestock standing in the bed of the lorry. Technological innovation in the structure of the vehicles has been limited to date but may be worth revisiting as roads are upgraded in the region. Alternatively, rehabilitated trekking routes could move animals closer to markets and create employment where lorry transport could be used on better roads.

Communications infrastructure, especially the expansion of cell phone networks, has positively affected livestock trade in the lowlands and it remains a sector where benefit–cost ratios are likely to remain favourable in the future. With increasingly better technologies, the potential to use mobile phone technology, including smart phones, to make trade more efficient and beneficial for all actors is considerable. If the past five years of rapid change are even a partial road map for the next five years, we can only expect greater innovations in trade and market behaviour and patterns in the future as a result of telecommunications. In particular with regard to livestock marketing, SMS and smart phone access to market information systems that report livestock market prices in real time can increase market efficiency if given support (see www.lmiske.net for Kenya and www.lmiset.net for example).

One infrastructure-related constraint to increasing frozen beef exports from the IGAD region to other African countries, as well as additional destinations, is the lack of appropriate slaughtering, cold chain storage and transportation facilities, including limited docking stations at ports that can be used until the shipment is loaded onto vessels. Although the benefits that could be derived from beef and offal exports are higher in financial terms, require less stringent SPS requirements and generate more employment than live animal exports, IGAD countries are forced, instead, to export live cattle because of the lack of fully integrated export facilities. Many of the export abattoirs in the region (for example in Somalia, Sudan, and Ethiopia) are small in size and mainly process sheep and goat carcasses The largest beef processing abattoir in the region is the Kenya Meat Commission in Nairobi, which was refurbished and re-opened a few years ago, but its economic performance has been below par due to financial and management problems. Ethiopia's older abattoirs have become obsolete in terms of meeting changing market demands; the country's two new beef processing abattoirs are located in Mekelle and Bahir Dar, which are far from production centres. Sudan has small-sized abattoirs in Omdurman that mainly process small stock carcasses, while the country's facility in Nyala is close to production sources but far from Port Sudan to facilitate shipment of frozen beef. As a result, the

Nyala factory mainly processes chilled mutton and beef, although currently it operates well below its capacity. In all cases, the regional beef processing abattoirs in the Horn are not operating in a vertically integrated system. Such a system requires a deboning facility, sufficient freezing capacity, refrigerated container trucks and appropriate docking facilities at ports to export substantial quantities of frozen beef instead of live cattle. At present these are sorely lacking in the region.

Institutional issues—planning, administration, coordination, capacity

The professional quality and training backgrounds of staff in local development institutions and planning agencies responsible for the lowlands are inadequate. Most institutions involved with planning and implementing development policies and programs in the dry lowlands are staffed by persons from ecological and cultural backgrounds other than the lowlands, with training in curricula that are inappropriate for the realities and challenges the lowlands present. Most staff are from higher rainfall zones and thus often advocate investments that are risky in dryland farming or expensive irrigations schemes.

A first step in building institutional capacity is to establish or build on existing training programs in the region that are geared towards lowland development. Promising examples that could be built on and expanded are new graduate programs in pastoral and dryland development at Mekelle and Hawassa universities in Ethiopia; the University of Nairobi and Egerton University in Kenya; and regional universities in Uganda and Sudan. Importantly, it is critical that faculty and staff at these and other institutions are trained on the economic, ecological and social realities of lowland production systems, especially mobile pastoralism. Unfortunately, past cases have shown that the teaching staff adopt course materials and models that are more suitable for highland rather than lowland realities and challenges.

Adequate incentives such as allowances and extra pay should be provided to encourage the placement and retention of government and development personnel in lowland areas to sustain institutions and programs. Staff turnover rate is high in most of the lowland areas, which destabilizes local institutions and hampers the administration and implementation of development policies and programs.

Conflicting goals and agendas make it difficult to coordinate the different programs and investments in lowland areas. For example, throughout the region there are planned and ongoing investments in large-scale irrigated agriculture, in water development and settlements that compete with lowland livestock production systems, especially mobile pastoralism, and the programs that support them. As noted earlier, there is an inherent contradiction between policies and investments that attempt to strengthen livestock trade and herder access to markets, but also advocate investments in alternative land uses and investments. These alternatives, if not well designed, will actually undermine the production side of the market chain responsible for insuring high-quality animals and animal products (Behnke and Kerven 2011).

One area of training and institutional support that remains undeveloped is research and training in producing irrigated fodder and grass. Planned investments in lowland irrigation in the region have mainly considered export and food crops and paid very little attention to fodder crops and grasses and how livestock production and trade might be better integrated with these plans.

Financing mechanisms

The key point is that currently credit flows from the bottom (producers and small-scale traders) of the value chain to higher levels where large-scale traders and exporters and urban meat wholesalers dominate. This paradox results from exporters and wholesalers delaying payments to actors down the chain until after they are paid. This pattern results in an unfair form of a credit subsidy.

A second issue is the problem of collateral for loans for both traders and herders. Can livestock be used as collateral for a loan? The picture is mixed. It is likely that there will be different credit arrangements for buying and selling animals in the different market chains. It is unclear whether the export operations themselves are undercapitalized

due to lack of credit or if they delay payments because of their excessive power in the market. If the latter is the case, which we suspect it is, then providing them with credit will not help those at the lower end of the chain who provide the product for the trade, and it probably will not have noticeable effect on the trade. However, providing credit to small-scale buyers would allow them to better time market purchases and sales, rather than purchase when they have been paid and have the cash.

This could assist both the market and the poorest actors in it. The challenge is how to organize credit to small-scale traders and producers. Recent innovations in index-based livestock insurance should be monitored to see what impact it will have on the use of livestock as collateral. By documenting assets in the form of livestock in a way legible to the formal sector, livestock wealth may be recognized and thus open new pathways to credit and finance.

Addressing the problem and challenges through acknowledged best practice

How trade and markets function and provide livelihood support

Markets in the lowlands function reasonably well in normal times and provide needed cash income and employment for lowland residents. It is during droughts and other shocks that markets have not played particularly positive roles in sustaining livelihoods and in matching willing sellers with buyers. The usual drought scenario has the following market characteristics: livestock prices fall as animals lose weight and quality; supply greatly exceeds demand as herders are desperate to unload animals before they perish; grain and food prices generally rise in the lowlands, which adds further pressure on herders to sell, especially since food productivity in the form of milk from their own herds is also declining; stressed livestock perish along trekking routes to markets; and producers in more remote areas are cut off from markets because their animals are unable to survive the long treks to market.

In short, lowland markets have a difficult time clearing all animals that are offered for sale, and the devastating result is considerable livestock and financial losses for the sellers. However, large-scale traders, especially those with access to outside feedlots or ranches with fodder, benefit during droughts by buying animals at low prices, keeping them alive with fodder and feed, and then selling them in the post-drought recovery period when markets and prices improve. Access to fodder and feed supplements to keep animals alive during droughts remains a key market and welfare constraint for herders because the lowland pastoralists do not have experience with preserving feed resources and building fodder banks for emergency purposes during shocks.

Following are best practice examples of markets and market agents who successfully adapt to new opportunities and changes. Most of these cases occurred during the past 10 years:

- leasing of Kenyan coastal ranches by traders to fatten animals for large urban and export markets.
- development of numerous small and large feedlots in highland Ethiopia (especially near Modjo and Adama/Nazareth) for the export and domestic urban markets.
- development of vibrant cross-border markets along the Ethiopia/Sudan, Somalia/Kenya, and Kenya/Ethiopia borderlands.
- development of camel export trade to Sudan, Egypt and the Middle East, and the extent to which traders have responded by sourcing animals across borders as far away as interior northeastern Kenya.
- use of mobile phone technologies to transmit market information—mainly among traders but also increasingly among herders.
- graduation of former bush markets as important secondary markets in southern Ethiopia in response to the growing demand for livestock.
- development of women's groups in southern Ethiopia that buy and sell small stock for the meat export trade.
- development of mid-highlands camel markets in Ethiopia and the rapid response by traders to this new opportunity.

- graduation of elite Boran pastoral groups as livestock traders in southern Ethiopia.

Other best practices applicable to the Horn can be found in West African countries such Niger, Chad and Cameroon, which have implemented laws to protect herd trekking routes—even across agricultural zones and international boundaries; encourage cross-border trade and herd movement policies that allow trade and seasonal migrations to take place without overly burdensome rules and punitive measures; and promote investments in water and holding facilities along key trekking routes. These kinds of investments and policies are sorely needed in the IGAD region and although their different dimensions, especially those on regional trade, have been discussed and advocated by COMESA, IGAD and the African Union, very little implementation has taken place on the ground.

Challenges to increased market orientation by pastoralists and agro-pastoralists

Despite periodic shocks and losses, livestock in the lowlands remain a valuable investment and insurance asset, a source of food income (mainly milk) and a form of capital that earns 'interest' through reproduction and growth. They are also important in supporting social institutions such as livestock exchange networks and marriage. Recent studies show that income from market sales is not the main source of revenue from herds; milk income (non-cash), for example, accounts for more than 50% of total household income for many households, and the implicit value of reproducing/breeding income also exceeds explicit incomes from sales in many cases (McPeak et al. 2011; Little et al. 2008). Therefore, it is critical to understand that the structure of pastoral and agro-pastoral herds is primarily geared towards food, especially milk, production and herd reproduction.

Unlike commercial herds oriented towards meat production, the female composition of pastoral herds generally is 65–70% or higher. These herd demographics represent a challenge to increasing market offtake rates for pastoralists and agro-pastoralists, since most markets demand mainly male animals. In periods immediately after prolonged dry seasons when grazing conditions are good, herders are often reluctant to sell bulls and breeding stock regardless of prices because of the favourable breeding and production conditions. A response to the perennial question, 'why don't pastoralists sell more of their livestock' is that 1) in the herd, there are not all that many male animals to sell, which are what the markets desire, and 2) herders have twin production goals of maximizing milk production and herd reproduction. Marketing of animals is done to support these twin production goals and it is not the dominant goal in this production system.

A second challenge was highlighted earlier in this brief: the declining resource and land base for livestock production. With increased commercialization, there is added pressure on limited grazing and water as large herders and traders begin to enclose parcels of the range for private use and income (mainly milk), or fatten animals before sales. The best natural resource conditions for livestock production are often in areas remote from key market centres and road infrastructure, which aggravates losses during droughts when animals die either in remote pastures or en route to markets. More prosperous traders can truck fodder and even water to grazing areas or to trekking routes to keep animals alive before sale. This option is available for a select few elite. Providing ways to improve fodder production or availability and trade near important market centres and trekking routes can help sellers recoup losses during long treks, and thus earn them higher returns.

A third challenge is related to market bans due to animal diseases such as FMD, which in many cases occur during dry periods when herders desperately need to sell animals. This problem is especially acute in lowland Kenya where, as noted earlier, the government still controls vaccination and veterinary drug distribution. When market bans and droughts occur simultaneously, local areas are overstocked and pasture, feed and water resources are quickly exhausted with the result that stressed animals often perish.

The fourth challenge is the near total absence of value-adding practices in the lowlands to maximize income per animal unit even when opportunities permit. Because pastoralists live far from terminal markets, most are not aware of the process their animals go through (for example, value addition)

once they have disposed of them in local markets. However, pastoralists in some areas were exposed to supplementary feed in the last six to seven years, especially during prolonged droughts, courtesy of emergency response interventions. Interest is growing in how these feeds could be used to add value to livestock. Currently, producer ability to use this input to add value is constrained by the lack of supplies in local markets and understanding their efficient use. This type of value adding could also be a challenge in cases where mobility involves the entire household, given that input markets are based in market towns. Despite these challenges, there are spatial and temporal opportunities for initiating value-adding practices in lowland areas and re-orienting pastoralists to produce for the market. There have been almost no research and extension efforts to identify least-cost rations, market-oriented animal finishing practices, and use market information systems to optimally time and locate sales opportunities in the lowlands (although a video describing a recent success in Metema, Ethiopia, by the Improving Productivity and Market Success project illustrates the potential of these kinds of activities: (http://blip.tv/ilrivideo/fattening-6047779).

In the future, three categories of animal flows from the lowlands to the market can be identified. One is the current flow where livestock produced in the lowlands are purchased from the producers at half or less of the terminal market price and transported to urban centres for consumption. A second, growing flow is livestock born in the lowlands, finished in ranches or finishing lots and sold in higher-return markets or at a higher price per head in urban meat markets. A third that does not yet exist in any significant amount is livestock born in the lowlands, fattened locally for market by people trained in this practice, and sold to higher-return markets or for a higher price per head in urban meat markets. With support this third category could grow significantly in the coming years.

Best practice in supporting functioning markets and trade, enhancing utility of markets and overcoming constraints

Two overarching points about existing markets are worth mentioning in opening this section of the analysis. First, livestock markets in the East Africa/IGAD region are functioning and have functioned for years under conditions of neglect by government. Animals are moved across vast distances from producers in remote arid and semi-arid rangelands to urban consumers. Often these movements cross international boundaries. The challenge is thus to improve efficiency in an already operating, internationally integrated market network.

Second, market activity in East Africa is facing new opportunities. The growth in high-value premium meat markets in urban areas of Kenya, both for domestic 'supermarket' consumers and for the tourist industry, has been pronounced. Similarly, the price of meat has gone up to USD 9 per kilogram in high-end traditional butcheries in Ethiopia. In addition, the export of meat and live animals has grown dramatically over the past few years due to increasing demand from Middle East and North African countries. Important changes are taking place in the livestock markets and the challenge is to ensure that producers in the ASALs capture some of the benefits of these new market opportunities.

Financial credit

One issue in enhancing market efficiency that needs to be addressed is financial credit. Here, it is most helpful to think of three potential users of credit. First, consider the pastoral producers. Pastoral producers generally possess a herd of substantial value. To the extent that they need credit, it is probably not to support pastoral production. (However, we note that evidence from Sudan suggests that poor pastoralists can benefit from financial credit to restock.) Recent innovations in index-based livestock insurance have created the possibility that herds could be used as collateral for productive investments; these efforts could be supported to help translate livestock capital into productive financial investments (see http://livestockinsurance.wordpress .com/). We again note that these investments will probably not be directly related to pastoral production, estimating they will likely be related to income diversification and education.

A second group consists of those who are potentially adding value to livestock produced in the pastoral production system. One subgroup is service providers, largely providing veterinary services to

producers. To the extent that animals are disease free and healthy, they are able to access higher returns in domestic and international markets. Another subgroup of animal finishers purchases livestock produced in the rangelands and over a short period provides the animals with commercial feed and care that renders them higher-value commodities. Value addition can also be practised in some areas of the rangelands by using windows of opportunity over a short period. Doing so could potentially transform the mind-set of pastoralists to producing for the market and increase the income they receive per animal unit.

The final group, which is probably the most in need of credit although large sums are involved, are the traders. Recent innovations by the Kenya Livestock Marketing Council have made credit issues and default less prevalent than they were a decade ago, although there are still issues to address. Owing to the lack of such services from mainstream sources, livestock traders were given financial credit by non-government organizations (NGOs) on two separate occasions in the past five years to purchase drought-stricken animals in Ethiopia. In both cases, substantial numbers of animals were purchased and the loans were repaid in full. However, the absence of similar financial services in normal market operations means that most livestock transactions in pastoral areas take place on credit. As noted earlier, this in effect requires producers to extend credit to traders. The result is deferred payments to producers at the best of times, and, given default issues in the terminal markets, almost certainly depressed producer prices as traders have to factor in some likelihood that animals sold in terminal markets on credit will not ultimately be paid for. This common practice shows that the low capital base of livestock traders puts pastoral producers more at risk than any other group in the market chain, and also depresses overall market functioning.

Support for mobility

Support for mobility involves three main points. First, governments and donors should consider carefully the implications for the mobile livestock production system of investments in cultivation, especially irrigated cultivation. It is not always clear that the economic benefits of cultivation, irrigated or rainfed, outweigh the costs imposed on livestock production systems through the loss of grazing land and access to water points. In fact, a comparative study of irrigated agriculture to livestock production in the Awash Valley of Ethiopia (Behnke and Kerven 2011) substantiates the economic advantage of the latter, including the sustainability of the environment. As noted earlier, there is a disconnect between trade policies that promote increased livestock trade from the lowlands and those that support alternatives to livestock production and land use.

Second, locally defined land-use management plans that include conflict management components should be supported to ensure land-use plans are locally defined and enforced. Local communities have the ability to define and enforce rules and regulations about the timing and use of natural resources, but these are rarely recognized by governments, consequently undermining both production and trade from these areas (Haro et al. 2005).

Third, as trekking routes are essential but neglected parts of the market network, support for the preservation and functioning of market trekking routes is critical. The routes can be supported as an alternative to trucking of animals to markets, which, as earlier discussed, is occurring in some parts of West Africa. Trekking routes have generally been neglected in terms of infrastructure, have been encroached by other land-use activities and confront issues of insecurity.

Disease monitoring

The recurrence of trade bans since 1999 demonstrates the absence of robust provision of veterinary services and, more importantly, the lack of systematic monitoring of both production herds and trade animals. A study by Tambi and Maina (2002) in five African countries indicates that resources allocated for veterinary services in Kenya and Ethiopia represented very low proportions of the national recurrent budgets. Disease monitoring—whether for productive or traded herds—can only be meaningful if supported by robust and sustained provision of veterinary services, and vice versa. At the moment, both production and trade in animals in the concerned countries take place with minimal veterinary support in terms of periodic vaccinations, provision of drugs for timely treatments, and

laboratory and related services. Similarly, lack of effective monitoring and sustainable disease reporting systems across countries in the region keep livestock keepers vulnerable to both regular anticipated and unexpected disease outbreaks. In fact, the weakening of the system is reflected by increasing numbers of trained but unemployed veterinarians in recent years. IGAD member states should note that setting up a vigorous veterinary system is the prerequisite for boosting production and productivity that could lead to increased exports and domestic consumption. At the least, such a system could help minimize avoidable livestock mortality rates hovering at 10–20% in the region.

A robust veterinary system needs to be strengthened by an equally effective monitoring mechanism that could respond to disease incidents in a timely way. Monitoring entails regular (bi-weekly or monthly) reporting of the occurrence or control of diseases in defined geographical areas, including reporting incidents of hitherto unknown disease. Monitoring tracks the prevalence, spread and recurrence of disease types by different ecological or production zones, including the emergence of new diseases when they happen. The regular flow of such information enables the system to pre-position effective preventive services for the specific needs of each ecological zone as required, and to strengthen the preparedness capacity of the system for timely responses in cases of unanticipated outbreaks.

Given the increasingly stringent SPS requirements by importing countries, the importance of putting in place an effective monitoring mechanism along with a robust veterinary system cannot be overemphasized. Similarly, given the progress made in communication networks, it remains unclear why regional countries are not intent on strengthening veterinary surveillance and monitoring systems, despite their desire to increase livestock and meat exports. In fact, what they need is not only to strengthen the national system but also to set up a regional platform to exchange monitoring reports so that they can jointly act swiftly when disease outbreaks occur in border areas. AU-IBAR might be an effective institutional platform to implement such a system regionally.

Value-chain approaches and market hubs

Value-chain approaches have illustrated three main points with regard to pastoral livestock production. First, there is room to improve producer incomes and well-being: producer prices are generally 50% or less than the terminal market price within the country, and considerably less for international markets. Second, niche markets can be accessed, but to do so will require additional activity beyond the normal practices of pastoral producers. These activities have created new market opportunities for value-added finishing operations in ranches, and in a few cases, created opportunities for value-added finishing in towns in the pastoral areas using locally available fodder. This latter opportunity is largely unrealized at the moment, and little has been done to train people in producing fodder crops or using them in finishing operations. Third, as noted in the introduction, value-chain approaches have identified new opportunities that have opened up in livestock markets over the past few years that potentially could benefit pastoral producers and other residents of ASALs if given support.

Increased commercialization leads to more robust markets, which provide opportunities for market hubs to develop in pastoral regions. Secondary livestock markets in pastoral areas are increasingly becoming hubs by attracting livestock and non-livestock-related service providers, thereby providing new employment opportunities. Such secondary markets attract supplies from bush and primary markets and serve as the final staging points for supplying terminal and export markets. By virtue of their location and volume of transactions, such markets can serve as the ideal points of entry to introducing qualitative changes in graduated phases—such as introducing auction or weight- and grade-based transaction systems, providing vaccination (and also treatment) of purchased animals, providing feed, fodder and water until purchased animals are bulked and transported, and creating related services such as security and loading animals. Given the increasing numbers of pastoralists dropping out of the system because of a multitude of shocks, including the adverse effects of commercializing (Aklilu and Catley 2011), such hubs will be instrumental in providing alternative livelihoods for those who exit the system and some who may stay within it.

Furthermore, as the volume of transactions increases in such hubs, qualitative changes are likely to follow to meet the demands of the market. If the transaction system shifts to an auction or weight- or grade-based system, the production mode is likely to be market oriented, even if in gradual phases. Opportunities created by the market hubs can also encourage the population living in or close to such towns to be engaged in value-adding practices through the use of fodder or commercial feed, or a combination of both. Such practices are common in Darfur and Kordofan in Sudan. Pastoral cooperatives in southern Ethiopia introduced to commercial feed during emergency operations are now planning to buy similar feed for value adding in normal years. When windows of opportunities exist and water and pasture are available, pastoralists have a cost advantage in finishing cattle or small ruminants for the market. The transport cost of commercial feed is more than compensated by the relatively free availability of complementary inputs of pasture and water in ASAL areas. Non-lowland value-added enterprises incur considerable costs for such inputs. Such value-added activities could enable pastoralists to access niche markets and increase employment opportunities.

Again, we stress very little effort has gone into training people in these activities and creating awareness of the requirements of niche markets. Future extension activities should include identifying the right mix of feeds at the lowest cost, feeding animals for the correct length of time for maximum gain in price per head at lowest cost, and using market information systems to maximize revenue of sale. These remain largely unexploited opportunities under current conditions.

Coupled with these activities is the potential to produce fodder crops in livestock-producing areas, particularly in riverine areas. A recently phased-out project in the Somali Region of Ethiopia demonstrated how the introduction of fodder cultivation increased household milk production and incomes, and the Kenya Drylands Livestock Development Program has had success in producing and using irrigated fodder crops. The potential exists in such areas to cultivate fodder for milk as well as meat production. Whether these irrigable areas can supply cultivated fodder to secondary market hubs depends on accessibility and the cost of transportation. However, cultivated fodder products are likely to be traded within producing areas, which would lead to value-adding practices, creating localized market hubs, and finishing animals for both local and secondary markets. If access to markets were to improve—for example, through constructing new roads—the supply of cultivated fodder could extend to distant market hubs. There is especially high demand in Djibouti and similar lowland ports, such as Berbera in Somaliland and Port Sudan in Sudan, that are key export outlets. The potential impacts of engaging in fodder production include reduced mortality losses from drought as well as the production of marketable animals in non-drought years. These activities obviously translate to increased income and employment opportunities for those engaged in fodder production, transportation and distribution.

Sanitary and phytosanitary standards (SPS) [1]

For livestock trade, a key factor determining access to these opportunities has historically been a given country's status with regard to diseases on what is commonly known as OIE's list A [2]. For a given disease, OIE has identified a 'pathway for freedom'. At one extreme is where the disease is endemic; at the other is where it is eradicated. McLeod and Leslie (2001) identify eight different states of a disease that can exist in a country, from the extreme of endemic to eradicated. By laying out these states, it becomes possible to identify

[1] This section is an edited version of what was presented in *Future scenarios for pastoral development in Ethiopia, 2010–2025, pastoral economic growth and development policy assessment, Ethiopia* by PD Little, R Behnke, JG McPeak and G Gebru (2010), 57 pp.

[2] The World Organization for Animal Health is the English name of OIE. According to their old system, list A diseases are 'transmissible diseases that have the potential for very serious and rapid spread, irrespective of national borders, that are of serious socio-economic or public health consequence and that are of major importance in the international trade of animals and animal products' (OIE website). OIE recently revised their approach and the diseases listed in 2012 are described here: http://www.oie.int/animal-health-in-the-world/oie-listed-diseases-2012/.

where a given country is with regard to a particular disease, and begin to assess the costs and benefits of moving towards eradication. Few studies find that the benefits of eradicating a disease justify the costs in terms of improved productivity domestically. However, when disease status inhibits access to international markets, these studies find benefits from new trade opportunities may outweigh the costs of eradication.

Scoones and Wolmer (2006) outline different strategies for livestock health and export markets. One is 'disease eradication for safe trade'. Inspired by the success of the rinderpest control and eradication effort, this response aims—through providing veterinary services, research and development, controlling livestock movements and supporting market infrastructure—to create production and marketing conditions that meet OIE SPS standards.

As noted, an example of this approach is found in Namibia and Botswana. In these countries, veterinary fences divide the country into zones. For example, Botswana has divided the country into 'EU zones', 'buffer zones' and 'non-EU zones' determined by fences and control posts. Zones are defined by whether FMD vaccination is required. The presence of wild buffalo is a key determinant of whether vaccination is necessary.

One drawback of this approach is the vulnerability to which it exposes a country should a disease outbreak occur. One example is the impact of a 1995 re-introduction of contagious bovine pleuropneumonia in Botswana. In response, 320,000 cattle were slaughtered at a cost of USD 100 million, 'with further indirect losses estimated at over USD 400 million' (Geering et al. 1999; Musisi et al. 2003), and the Maun abattoir has remained closed (Jefferis 2005).

Another vulnerability is that disease-free status can be changed, as illustrated by this announcement from the OIE's website: 'Following the report of an FMD outbreak and vaccination in the recently OIE recognized "FMD free zone without vaccination" in Botswana, the status of the "FMD free zone without vaccination" in Botswana is suspended, with effect from 20 January 2003.' A country may make substantial investment into establishing a disease-free zone then have this status revoked.

A different aspect is discussed by Meyn for Botswana (2007a) and Namibia (2007b). She finds the loss of preferential access for Namibian livestock products to the EU market would 'probably lead to the collapse of meat exports, with severe social consequences' (p.1). She further notes that the loss of this market would undermine the infrastructure in place to allow disease-free zones to exist. Even before 2007, the Botswana model was of questionable viability. Jefferis reported in 2005 that the Botswana Meat Commission had been unprofitable for five of the previous six years, had been consistently unable to meet its quota, and would have been insolvent if it had not been for government subsidies. The government found itself in the unenviable position of subsidizing the export-oriented meat industry while facing producer complaints of low prices and desire to sell in other markets that would pay higher returns, notably South Africa.

It is technically possible that countries in the Horn of Africa could follow the model of Botswana or Namibia. It would require a disease eradication program in large areas of the country that would make the country eligible to produce for export markets, and then veterinary efforts to maintain and verify this status. It is hard to believe such an approach would be a wise use of scarce resources given experiences elsewhere. We do not see the creation of 'disease-free zones', with their very high costs and implementation and management problems, as a strategy for improving livestock trade in the Horn of Africa during the next 10–15 years or so.

A variant of this approach is to comply with SPS requirements through the process by which meat is produced from livestock rather than the disease status in the region of origin of the livestock. This is the so-called commodity-based approach to livestock trade, where the focus is on a safe product (in this case, meat) rather than a costly disease-free environment for live animal production and export trade. It establishes a processing strategy that meets international export standards and thus allows access to international markets.

Rich et al. (2008) analysed the feasibility of a two-stage SPS certification process for the Ethiopian livestock sector. They outline the following process: 'The system would first entail pre-selecting animals in local markets, followed by the initial testing,

vaccinating, and quarantine of animals over a 21-day period in its first phase (Phase 1). In the second phase (Phase 2), quarantined animals from Phase 1 would then be finished in a feedlot system to bring them up to export weight (400 kg).' Phase 1 facilities are envisioned to process 130 head of cattle every 4 weeks and would be privately owned but overseen by a 'competent authority'. A phase 2 feedlot would hold up to 5000 head of cattle. They found that the break-even price per tonne needed to operate such a system was about USD 1000 more than the cost of Brazilian and Indian meat currently available in the markets of Bahrain and Qatar. They argued that 'under current input prices, the proposed system is not economically feasible for exports targeted to Middle Eastern markets.

However, the problem is primarily due to the current high cost of inputs, especially feed, and not the marginal costs of the SPS certification protocol, which are only 5% of the break-even value of the final product.' The feed market has recently been analysed in Ethiopia by Gebremedhin et al. (2009) and would appear to be an area where substantial research and development could lead to significant efficiency gains. If least-cost rations can be identified or designed, they could potentially make the two-stage SPS certification process the authors identify economically viable in the future in the Horn of Africa.

Role of improved decisions and policies at local, national and regional levels

In contrast to the crop-farming sector, the marginalization of the lowland pastoral production system in the region is rooted in policy-related constraints marked by ambiguous or inconsistent policies and, in a number of cases, by policies that have directly threatened the very survival of the system. Our general perception about such policy constraints is that national policymakers lack a good understanding of lowland pastoral production systems. As pointed out earlier, most policymakers come from highland and farming backgrounds and prioritize that sector over pastoralism, and highland over lowland areas. Increasingly in the last few years, national governments in the region, as reflected in their annual plans, seem determined to raise substantial export revenues by increasing live animal and meat exports. Increasingly, they are becoming aware that the animals that generate this revenue are almost exclusively sourced from lowland pastoral areas.

In contradictory terms, most policymakers recognize the trade and revenue potential of livestock systems but fail to recognize that it is their production and resource bases that generate the tradable commodities that contribute to economic growth. Even under current policy constraints and challenges, the lowland (pastoral) system of the region through commerce contributes over USD 1 billion in foreign revenues per annum. This figure is for combined earnings from Sudan, Somalia, Ethiopia and Kenya, and would be considerably higher if domestic livestock transactions were included. This substantial resource base alone (notwithstanding the millions of pastoralists who depend on the system) confirms that the system is productive, dynamic and adaptive to changing circumstances despite the multitude of recurrent shocks it faces, including policy-induced ones (see for example Behnke and Metaferia 2011). More importantly, the system is also capable of significantly increased economic value if supported by enabling policies locally, nationally and regionally.

Land tenure, production and marketing are three interrelated priority areas that support trade from the lowland areas. However, it is difficult to address policies for one issue without reference to the other two.

Mobility and land tenure

Three pillars of equilibrium in pastoral production are the balance among 1) human population, 2) livestock population and 3) the natural resources base. Any imbalance among these three dimensions can jeopardize the system. Controlling the growth in human and livestock populations is a complicated process and beyond the scope of this paper. The most pressing issue that is affecting the system adversely concerns the use of natural resources. Fortunately, this imbalance can be rectified through appropriate land-use and land-tenure policies that protect dry season grazing reserves of communally owned lands and provide infrastructure and security so that 'no-go' insecure rangelands are put back into productive use. The productivity of the system, including the trade dimension, is intrinsically linked to the availability of natural resources: water, pasture and shrubs. However, it is equally important to note that accessing such resources requires mobility, both within national boundaries and at times across international borders. Enabling policies need to consider these two intertwined factors of availability of resources and mobility to access them in relation to the sustainability of lowland systems. Proactive pastoral policies could recognize the importance of

land tenure and mobility for the productivity of the system, as well as the subsequent exports of live animals and meat.

Locally

- Empower local authorities to protect demarcated grazing reserves and mobility corridors, and ensure the safe passage of different pastoral communities, including cross-border movements, as the need arises.

Nationally

- Demarcate dry season grazing reserves and mobility corridors, and legalize them with appropriate title deeds (as is the case with farmlands) to protect such areas from being acquired by outsiders and to ensure the safe passage of pastoralists (see earlier discussion of West African policies).
- Return grazing reserves acquired by individuals through dubious means to the rightful owner communities to foster livestock productivity.
- Where huge tracts of grazing land have been taken for large-scale irrigation schemes or where such new projects seem to be inevitable due to 'national priorities', an enabling policy could ensure that fodder production is incorporated in such projects to compensate pastoralists for the loss of grazing land, and corridors are established to allow watering rights for livestock.

Regionally

- Ratify a regional agreement that allows pastoral communities safe passage across borders for grazing and similar purposes to promote the peaceful coexistence of communities straddling borders and minimize conflicts.

Enabling policies to support the pastoral production system

Perhaps the greatest disparity between crop farming and the lowland herding communities is reflected in the national support provided to the former such as enabling policies, resource allocation, technical support and infrastructure. For example, farming communities are privileged to access loans for farm inputs, including the right to use their land as collateral, and are supported with extension services, training and research geared towards their needs. Such advantages are either minimal or non-existent in pastoral areas. Enabling policies could redress the imbalance in the following areas:

Regionally

- Coordinate and harmonize disease control and prevention programs across the IGAD region.
- Develop a regional veterinary protocol in which simultaneous vaccinations take place for transboundary disease control, including during outbreaks in border areas to make the effort effective and minimize recurrence of diseases.
- Ratify an agreement and develop a mechanism to minimize cross-border conflicts, including controlling illegal arms, to avoid unnecessary loss of human lives and destruction of property.

Nationally

- Allocate commensurate resources for the sector to provide appropriate parallel services as provided to farmers (training, extension, research) along with providing robust veterinary services to reduce unnecessary livestock mortalities.
- Explore ways in which livestock can be used as collateral to alleviate short-term cash needs of pastoralists, including providing credit to poor pastoralists for restocking.
- Provide credit to animal health workers and livestock feed retailers to make such services available in close proximity, and to pastoral groups to promote value-adding practices to boost productivity and raise household income per animal unit.
- Promote the production of fodder crops in riverine areas for both value adding and reducing drought-related mortalities to

increase overall economic productivity.

- Devise a national strategy to minimize the effects of emergencies as and when they happen through allocating contingency funds. For example, pre-positioning feed stock and supporting livestock offtake through providing credit and logistics to minimize large-scale mortalities in cases of protracted droughts.

Locally

- Alert national authorities of imminent shocks for appropriate timely responses.
- Facilitate producer access to government-supported services to increase livestock productivity and avoid unnecessary losses.
- Facilitate or coordinate the disbursement of loans to relevant individuals and groups, and monitor how the loans are used and their impact.
- Coordinate transboundary vaccination with cross-border counterparts for effective results.
- Coordinate with cross-border counterparts to minimize conflict.

Livestock marketing

Two prominent issues stand out as constraints to marketing policy: multiple taxation of traded livestock en route to destinations, and restriction of the sale of livestock across neighbouring borders. The latter practice arises from market proximity, favourable prices, or lack of alternative market options. Other constraints include lack of credit for livestock traders, and poor infrastructure (roads and communications) and associated logistical problems to safely transport livestock to interim or final destinations. Enabling policies could rectify such problems through the following measures.

Regionally

- Ratify a regional agreement among neighbouring countries with the necessary provisions to let pastoralists sell livestock across the border without restrictions; COMESA or IGAD could be the appropriate institutional mechanism for achieving this agreement.
- Ratify a regional agreement that specifies the SPS requirements for cross-border livestock trade.

Nationally

- Put in place a nationally binding system in which traded livestock are taxed once at the point of origin, to avoid unnecessary multiple taxation and increase income for pastoralists; traders take future taxation into account when offering low prices to herders.
- Allow pastoralists to sell livestock across international borders near them to meet their basic needs in cases where alternative internal markets are non-existent or unattractive. The solution is to provide alternative attractive markets rather than restrict selling options for producers.
- Provide credit services to livestock traders to enable them to pay pastoralists in cash rather than on credit, which results in deferred payments or none at all.
- Provide loans to promote the acquisition and use of designated livestock trucks to ensure the safe arrival of livestock at destinations.
- Repair and construct rural and tertiary roads in lowland areas to facilitate the movement of livestock and other commodities.
- Set up cattle slaughtering and processing provisions in strategic locations with appropriate deboning and adequate freezing capacities; provide suitable refrigerated container carrier trucks to transport frozen beef from abattoirs to ports. Obviously, such provisions would require substantial investments for individual exporters. The alternative is for member states to provide these provisions on lease or through service fees to individual exporters or exporter associations.
- Promote adequate refrigerated docking facilities in key regional livestock trade ports (Berbera, Bosasso, Djibouti, Mombasa and Port Sudan) to maintain the cold chain within the recommended optimum temperature until shipments are loaded onto vessels.

Locally

- Ensure that livestock taxed at the original point of sale are not taxed again at subsequent stages.
- Allow pastoralists to sell at cross-border markets without restriction.

Lessons learned and recommendations

Our team identified several important lessons and recommendations where governments and donors can make a positive contribution to lowland (especially pastoral) production and marketing systems. These recommendations go beyond markets as an object of enquiry and in some cases expand the focus to the larger production system that generates the livestock that enter the markets. As this brief has argued, the pastoral production system supplies the vast majority of livestock that end up being traded in different markets—including export outlets—in the region. Pastoral producers have filled this role with little support from government or donors over the years. While government and donors can take steps to improve the production and marketing system, our first key message is not to undermine pastoral production systems with interventions that undermine rather than support or complement them.

Actions that can either support or undermine pastoral production are largely related to land tenure and land use. Developing irrigation in the lowlands can support pastoral production (for example, growing fodder crops for supplemental feeding, grazing stubble after harvest, and creating designated water points for livestock) or undermine it (for example, eliminating access to key riverine water and grazing resources). Land-tenure reforms can support pastoral production through clarifying shared rights and locally designed and enforced rules and regulations governing access, or they can undermine pastoral production through privatizing common grazing lands and water points and investing in competing large-scale crop-farming schemes.

Providing town-based opportunities for ex-pastoralists can support pastoral production through developing key market hubs and infrastructure, alternative income-generating opportunities and value-added finishing opportunities in towns and by expanding education opportunities. Or they can undermine pastoral production by limiting mobility, distributing space for people and livestock suboptimally, and destroying forested areas near towns.

We stress that if actions are taken to undermine pastoral production, markets also are badly hurt since there will be a reduction in tradable livestock and products from the lowlands.

With regard to trade, we suggest specific recommendations based on the assumption that investments to improve lowland pastoral production systems will also be supported.

Infrastructure

- Construct low-cost tertiary roads to improve market access in more remote areas.
- Improve water points and water availability along long-distance market routes.
- Improve security, lack of which can strongly affect trade.
- Improve mobile phone coverage.

Direct trade and policy-related trade issues

- Use trade and markets to improve drought cycle management.
- Simplify requirements and information for cross-border trade. Help ‘brand’ animals produced from the lowlands as ‘natural’ or ‘organic’ so as to tap into markets in the Middle East and Southeast Asia.
- Support regional trade missions and studies to improve regional trade within Africa between surplus (Ethiopia and Somalia) and

deficit countries (Angola, Central African Republic, DRC, Mozambique and West African countries).

- Support legal and cadastral surveys to codify and protect market trekking routes and herd migration routes; West Africa has some good models (see Little et al. 2010 for more details).
- Support extension for fodder production and use of commercial feed for fattening animals nearer lowlands.
- Support training for producers in least-cost rations and fattening techniques.
- Support extension to enable pastoralists to produce marketable animals.
- Support the dissemination and use of market information systems by producers and traders.
- Support the continued development and expansion of index-based livestock insurance.
- Further efforts to connect producers to value-added processing units, such as finishing operations and higher end retail outlets.

Capacity building

- Support curriculum development in university degree programs in pastoral and lowland development.
- Support the training of policy analysis and development practitioners in pastoral production systems and market development in lowland areas of the Horn (IGAD could possibly serve as the institutional basis for this).
- Support training of livestock producers in marketing and value-adding production technologies.
- Provide skills training for pastoralist youth such as in carpentry, masonry, plumbing, cobbling, electricity, tailoring, skins and hides preparation and preservation, irrigation pump operation and maintenance, butchery, honey production and extraction, grain and commodity shop management, to provide meaningful employment for those exiting the system.
- Where possible, support complementary activities such as the production of oil crops, legumes and nuts, whose by-products can provide high-energy, high-protein livestock feed.
- Work with communities to develop drought cycle management plans and funding mechanisms using examples such as the LEGS (Livestock Emergency Guidelines and Standards) model.
- Monitor and evaluate the given training or capacity-building program in due time.

Priority interventions/timeline, including explicit discussion of the value of each intervention to problem solution

Several costly projects have been initiated in the lowland pastoral areas of the Horn of Africa over the past three decades, with some costing USD 20–40 million or more. These projects have been funded or implemented by governments, NGOs and donor agencies to address the numerous shocks and challenges facing the residents of these areas. The effectiveness and impact of these interventions have been uneven. This section addresses key priority interventions that need to be considered towards improving the pastoral livestock sector in the region, with those that require immediate attention presented first.

Institutional strengthening and capacity development

Primary focus needs to be directed towards developing educational institutions, including colleges offering diplomas. A few important considerations must be kept in mind when establishing institutions of higher learning for pastoral lowlands. First, as mentioned earlier, these institutions should develop curricula that emphasize the development needs and priorities of the residents of these areas. Second, these institutions should be located in the pastoral lowlands. Third, as much as possible these institutions should be run and managed by experts who originate from these areas or have years of experience in them. Given political realities of these areas, diversity within the local ethnic makeup should be taken into account when developing student and staff recruitment policies.

Universities are expanding rapidly in Ethiopia, Kenya, Somalia (particularly northern Somalia) and Uganda and are offering diverse training in different degree programs. These can be built upon, but specific support will be needed to address pastoral issues. For example, the Sheikh Veterinary School located in Somaliland is a prominent example of a relevant institution that could be an important resource for developing the livestock sector in northern Somalia.

However, in addition to veterinary coursework currently offered, other courses on socio-economic and ecological aspects of the drylands need to be developed for a more holistic education about drylands and pastoral development issues. Hawassa University in southern Ethiopia and Jijiga in eastern Ethiopia are other examples of institutions in the pastoral lowlands where similar efforts could be launched.

In contrast, there has not been a significant effort to establish an institution of higher learning in pastoral areas of northern Kenya, although the government recently upgraded the Garissa Teacher Training College to university college status, which could be explored as a base for dryland-oriented education. While these examples illustrate there have been positive moves towards building institutions in pastoral areas, the emphasis of the programs offered must relate directly to the needs and realities of the region's pastoral areas as opposed to offering the same coursework as highland-based universities. Donor support could help to build this capacity.

Specialized training at certificate and diploma levels also needs to be supported. Graduates of these courses are retained more easily than the highly qualified staff who briefly come to these areas but often relocate to national capitals or join highly paying international organizations. Also,

private sector investment in higher education has expanded in other parts of the region, particularly in its cities. Public–private partnerships can support the rapid establishment of these institutions in pastoral areas of the region.

Infrastructure

The basic systems and support services for conducting sophisticated businesses in the pastoral lowlands are largely lacking. Major infrastructural facilities such as roads, safe water and telecommunication systems require heavy investments that only governments can initiate.

While the domestic livestock trade has increased in volume in the past decade in the Horn of Africa and is less risky than volatile export trade, there has not been a corresponding improvement in infrastructure in livestock-producing areas to benefit this crucial activity. For example, road networks and the institutions to maintain them remain poor in most pastoral livestock-producing areas. To support livestock fattening on ranches and feedlots in or near pastoral lowlands requires meaningful investment in infrastructure to facilitate safer, faster and affordable delivery of livestock and livestock products to domestic and export markets. Roads, for example, are being paved in eastern Ethiopia linking major towns and market centres, and in northern Kenya between the key market towns of Isiolo, Marsabit and Moyale. In Somaliland and Puntland, roads linking livestock-producing areas with major markets and ports are in poor condition. Lobbying on the part of regional bodies such as IGAD, COMESA and the East African Community must be emphasized so that governments prioritize infrastructure development in the lowlands and ease unnecessary restrictions on telecommunication and the movement of people and livestock.

Policy and legal dimensions

Streamlining policy issues in pastoral lowlands is a priority intervention that requires multiple options consistent with the institutional and administrative structures of different countries in the region. Ethiopia, for example, practises a selective cross-border livestock marketing and movement policy. While Ethiopia criminalizes any movement of livestock across its borders with Somaliland, it tolerates such movements on the Kenya/Ethiopia border areas. The latter practice is undoubtedly due to the lucrative camel trade passing through the southern Ethiopia region destined for feedlots near Adama and eventual export to Arab countries.

Fattening livestock on leased ranches and feedlots near Mombasa and Addis Ababa is an important initiative, but it raises thorny tenure issues. Ranches may be situated on private lands with minimal legal problems, but in Kenya, fattening ranches often are leased from defunct local cooperatives and government ranches. Serious legal battles have recently erupted to evict Somali ranchers from these ranches on the pretext of their harbouring poachers and militants.

The legal aspects of livestock movement, trading and fees collected, sometimes at multiple markets, are not clear and need to be urgently addressed. Recent FAO work on livestock trading in northeastern Kenya noted that livestock moved from Garissa to Nairobi are required to pay a ‘landing fee’ mandated by the Nairobi City Council before livestock are disembarked in the city. Questions that livestock traders often ask include whose law is this, why now, and have livestock traders not been consulted on this form of taxation? Livestock traders argue that once the county councils from where the livestock originated have been paid taxes and the veterinary department has authorized the movement of the livestock for slaughter in Nairobi, what is the justification for this additional tax?

Financial instruments

Creating credit instruments for livestock producers, traders and service providers would appear to be appealing, but this is another area where impact has been mixed. First, it is important to note that transactions between herders and livestock traders are mainly in cash. When cash is not available, producers are forced to transfer their animals to traders who then pay producers only after final sale of the animal. This practice clearly gives rise to defaulting. The largest default problems currently originate between livestock traders and livestock and meat wholesalers in Nairobi markets.

Second, it should be noted that large-scale livestock traders control large amounts of trading capital. It is rare to hear from large-scale traders that they need a loan to start or improve their trading enterprise. Most of the capital for livestock trading in lowland zones originates from personal savings, other investments and local loaning systems.

Finally, access to veterinary services with genuine and high-quality medicines and qualified staff is a priority as this service guarantees healthy animals that can be presented in international markets. Providing credit and supervising this sector will be critical components of an integrated effort to improve market performance.

Research analysis, knowledge management

Monitoring and evaluation (M&E) is a critical aspect for any future interventions, especially the kind of integrated efforts that we address in this brief. Overall, M&E is required to identify the parts of integrated programs that are working and those that are in need of revising for the overall success of development efforts.

Perhaps the most critical research need is in animal feed markets, as these markets appear to be the most binding constraint to improving value-added livestock marketing. Producers should be trained in methods of fattening animals, as fattening is a new market practice. Producers of feeds need to be trained and supported in producing feeds for finishing operations, since this is also a relatively new market.

Other research and extension efforts could focus on financial literacy, to ensure that producers and service providers understand the implications and costs of different financial products such as loans. New insurance products also require informed consumers, an important topic for extension efforts.

Similarly, market information systems work only if producers are informed of how to use them and rely on them to make marketing decisions. This is another area where extension efforts could be augmented to help create awareness of this tool and training in how to use it.

Drought management plans, such as the LEGS, are an important new area where local communities can cooperate with donors to define ex ante steps to be taken in climate-driven crises. Research and participation can help ensure that these locally made plans are as well designed for local conditions as is possible.

Finally, land-use research can help make informed decisions about land-use management plans. Local knowledge about livestock trekking routes, animal grazing and watering paths, cultivation zones, and market access routes can be discussed with communities to serve as the foundation for local conventions governing land tenure and supporting mobility.

Other recommendations

Development interventions in pastoral livestock production and marketing always require coordination among different institutions and agents. Since there are many areas for priority interventions, it is often the case that multiple agencies and organizations implement activities that at best may end up doing the same thing in the same locations but may even work at conflicting purposes. Second, it is important to consider local, customary and existing efforts in order to build on them. Third, it is important that interventions be based on locally stated priorities rather than priorities based on agendas determined elsewhere. Finally, enhancing security should be a high priority item as a foundation for successfully implementing any program in the lowlands.

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