The path to greener pastures
Pastoralism, the backbone of the world’s drylands
Pastoralism is a livelihood system based on free-grazing animals that is used by communities in marginal areas. The land may be marginal for various reasons, including poor water supply or soil quality, extreme temperatures, steep slopes and remoteness. Pastoralism enables communities to manage their resources in a sustainable, independent and flexible way. It is marked by rights to common resources, customary values and ecosystem services. Some pastoralists combine livestock-keeping with growing crops for food or forage. Such agropastoralists outnumber those who rely on livestock alone for their livelihoods. This brief focuses on pure pastoralists who earn the majority of their income from livestock. Such pastoralists move their animals from place to place. They may do so from a fixed location (sedentary systems), move regularly between relatively fixed positions (transhumance), or move from place to place following an irregular pattern (nomadism).

Estimates of the numbers of pastoralists worldwide range from 22 million to more than 200 million, depending on the definition used and the age and quality of the data. Many of them are in sub-Saharan Africa, where pastoralism is a major land use in an area stretching from Senegal in the west, across the Sahel to Somalia, and southwards through East Africa to Botswana and Namibia. In many countries in this arc, pastoralism is a major form of livelihood: the Arkhangai in Mon-
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We analysed the findings in terms of seven “community capitals”: natural, financial, built, human, cultural, social and political (Figure 2). These seven capitals affect each other in various ways, both directly and indirectly, and positively and negatively. We look at each in turn.

**Natural capital**

Land and vegetation

Pastoralism is often associated with grasslands, rangelands or drylands (these terms are overlapping but not synonymous). But the match is far from perfect: pastoralists also herd their animals in the tundra, mountains, forests, desert and bushlands, and some grasslands are ranched or used for intensive livestock raising. Estimates of the area of pastureland vary hugely, between 18 and 80% of the world’s land surface. This vagueness is partly because (unlike for forests, for example) no organization is responsible for keeping track of such types of land.

Access to grazing land is vital for the pastoral mode of production. Pastoralists use few or no external inputs, and they exploit land too marginal for other agricultural uses. For many areas, pastoralism is the only viable land-use type. It uses land and vegetation in a sustainable way as long

Figure 2. How the environment affects the economy and human well-being, and vice-versa.

1: Direct ecosystem services: food, fibre, fuel, climate regulation

2: Nature’s inputs to the economy

3: Benefits from commercial products

4: Direct influences

5: Social and cultural services

6: Externalities

**Community capitals**

This brief summarizes the findings of this study. Our main recommendations below are marked with the symbol ▶.

Five participatory regional stakeholder gatherings, held in Bamako (Mali), Nairobi (Kenya), Hammamet (Tunisia), Hustai (Mongolia) and La Paz (Bolivia) in January 2016. Each of these meetings produced a statement on priorities for investment in pastoral development, along with recommendations for policy dialogue and partnership with development organizations. Selected delegates from the regional meetings also attended a special session of the Farmers’ Forum on pastoralism, which produced a global statement.

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golia; the Altiplano (parts of Chile, Bolivia and Peru) and Chaco (on the border between Argentina, Paraguay and Bolivia) in South America; Wagadou (straddling Senegal, Mauritania and Mali) and Gourma (between Mali, Burkina Faso and Niger) in the Sahel; Tris Zemmour (northern Mauritania and Western Sahara); and the Afar (Ethiopia) and Chalbi (Kenya) areas in Eastern Africa. We interviewed 49 pastoralist leaders about general practices in the area, and 315 members of pastoralist households about the use of natural resources, herd size and market access, animal health services, adaptation to drought and climate change, nutrition and food security, information sources and social networks. These surveys were also conducted in October–December 2015. Forty-three percent of the interviewees were women.

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**Figure 1.** We conducted a survey of the enabling environment and policies in 26 countries, and questioned 315 pastoralists in 8 “hotspots” about their practices.
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as the pastoralist system is balanced: that is, if there is freedom of mobility and access to land, political stability, etc. Pastoralism has shaped and helps maintain landscapes, and conserves biodiversity.

Livestock

Pastoralist livestock include various herbivore species, including cattle, camels, sheep, goats, yaks, reindeer, alpaca and llamas, horses and donkeys. Sheep and goats are the most numerous species. While some pastoral systems largely depend on single animal species (reindeers in tundra, camelids in the Andes), in most areas pastoralists combine several species. An example of this are the Turkana in East Africa, who keep camels, donkeys, cattle, sheep and goats. Keeping several species mimics the natural ecological coexistence of multiple types of herbivores, enabling them to exploit different niches and use renewable resources efficiently.

Pastoralists’ breeding strategies favour the animals’ hardiness and productivity. This makes pastoralist systems more resilient towards external shocks, and in most situations, the herds are perfectly attuned to the local ecological conditions as a result of hundreds of years of natural selection and selective breeding.

- The role of pastoralists as “keepers of genes” preserving biodiversity deserves recognition and support.

Water

In the drylands, the availability of water is key for the survival of both livestock and humans. Water sources include natural water bodies (springs, rivers, lakes, waterholes) and artificial (boreholes, wells, sand dams and water catchments), many of them built and maintained by local governments, development projects or pastoralists themselves. Many water sources dry out in the dry season or during droughts. This may have positive implications for the environment: it forces herders to move elsewhere in search of water, allowing the surrounding pasture to recover. Drilling boreholes to provide water may have unanticipated consequences: people and livestock attracted by a permanent source of water may overstretch the fragile ecosystem and carrying capacity of the surrounding pasture. In addition, boreholes are expensive to drill and may fall into disrepair.

- Communities should be involved in planning, building and managing water sources; their maintenance can be assured through user fees.

Trees

Trees are a key element in preventing desertification. They are important as a source of fodder, construction materials and fuel, as well as in providing shade. The latter is important to reduce heat stress: shaded cows use less energy and produce more milk. Nevertheless, the role of trees in rangelands and pastoralism is poorly understood.

- Research on this is needed, along with initiatives to protect trees and reforest suitable areas in pastoralist lands.

Climate

Because they are so dependent on the environment, pastoralists are severely affected by climatic fluctuations and by climate change. Herders have found ways to adapt to periodic droughts, or reduce their effects: they move to pastures elsewhere, split their herds, or reduce their herd sizes. Despite this, a severe drought can decimate a herd and leave pastoralists dependent on handouts.

- Efforts are needed to strengthen resilience of pastoralist communities to climate change by supporting local climate-related disaster management capacities.

Much concern has been raised about the contribution of livestock to greenhouse gases (mainly methane) and thus to climate change. In terms of emissions per kilogram of meat or milk produced, pastoralism fares poorly because dryland grasses are high in fibre and cellulose and contain little accessible energy. However, we must consider the whole livestock production cycle, taking into account the caloric consumption of the overall system: i.e. the source of feed and other inputs, the amount of resources
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used for their production and transport, the environmental implications and quality of manure, and the beneficial aspects of carbon sequestration in the system.

Cattle in grassland-based systems (ranching and pastoralism) contribute only 16.5% of global cattle non-CO₂ greenhouse gas emissions. In addition, compared to ranching, the pastoralist fraction is not associated with land-use changes that contribute further to carbon dioxide emissions. If we consider the carbon-balance of the overall system, pastoralism as a whole emits relatively few greenhouse gases, and it performs far better than other, more input-demanding, livestock production systems in carbon-balance terms. This is because it does not involve clearing land for ranches or large-scale fodder production, and it requires few external inputs. In addition, grasses accumulate large amounts of carbon in their roots, and shade trees and forests absorb and store additional amounts. Overall, pastoralism may even be carbon-neutral.

Climate change mitigation measures should include efforts to increase the digestibility of the forage through improved grassland management, as well as to increase the carbon sequestration potential by planting or protecting trees and rehabilitating degraded pastures.

Several studies exist that quantify the carbon footprint of livestock; however, comparative analysis is needed to assess the carbon balance of different livestock systems, including pastoralism.

Financial capital

Economic value

Pastoralism is a major contributor to the economy of many countries, especially in Africa and Central Asia. In Sudan, for example, it accounts for 80% of the agricultural gross domestic product, or an estimated US$ 16.5 billion a year. Official statistics underestimate its value because pastoralists themselves consume much of what they produce, and a great deal of trade goes unrecorded.

Livestock are the main privately owned assets of herders, and their major source of income and employment. Pastoralists use their animals for food (milk and milk products, blood and meat), products (hides, hair, wool and manure), transport, draught power and as a principal form of savings. Animal sales are thought to contribute up to 85% of the income of households in some East African pastoralist communities.

Other major sources of income include crops, charcoal-making, tourism, support from the government or relief agencies, credit schemes, and remittances from relatives working elsewhere.

Financial services

Pastoralists get most of their income from selling livestock products such as milk, cheese and ghee, or occasionally, live animals. Rural markets are the most important trading venues, with 41% of our respondents selling animals there. Some 35% sold through regional markets; 18% entrusted other community members to sell their animals for them. The more likely that at least some will survive a drought, and the faster their numbers will recover afterwards. Unlike crops and property, livestock can move away from problems; large herds can be split among several locations, spreading risk.

It is important to expand financial services to enable pastoralists and other residents to take advantage of economic opportunities. Mobile money services are a major way to transfer money safely in several countries, and they may become important as a vehicle for savings, credit and insurance.

Value chains

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... include helping them diversify their production, adding activities such as sustainable tourism, and applying for payments for ecosystem services.

**Built capital**

**Livestock markets and trading facilities**

A significant amount of investment has been made in trading facilities in pastoralist areas, but such facilities are still scarce, and those that do exist are often not functional or are poorly used. Marsabit, in eastern Kenya, for example, has five livestock markets, but none is operational due to mismanagement, a lack of support from herders, and irregular market days. Other trading facilities, such as holding grounds, loading ramps, inspection facilities, quarantine facilities and abattoirs, are less common.

- The local pastoralist community must be involved in planning, creating and managing such facilities if these are to be suited to local needs, accepted and used.

**Roads and transport**

Roads are few in pastoralist areas, and most are made of gravel or earth. In the dry season they are deeply rutted; in the rain they may be impassable. The high cost and difficulties of transport make it hard for herders to sell animals or dairy products, and for governments and development organizations to provide medical, veterinary or educational services. Feeder roads to link dry-season grazing areas to settlements or trunk roads are just as important as the trunk roads themselves. Many development initiatives focus on the inputs to and outputs from the economy, such as access to external markets and the provision of government services. But pastoralists themselves build and maintain a lot of facilities, including feeder roads, wells, dams and trade facilities.

- Such capacity – especially the built capital and services that originate within the pastoralist society – needs more attention.

**Human capital**

**Food security**

Pastoralists’ food security largely depends on their livestock: in normal times, between 20 and 50% of their dietary requirements come from milk, and they sell or barter animals to obtain staple cereals. They may also grow crops, collect wild fruits and honey, and earn money by selling charcoal, catering to tourists, and making handicrafts.

In a drought or other period of hardship, herders maintain their food security in various ways. We can classify these into two groups: “Distressed” coping mechanisms include selling off animals in order to buy cereals; more than 60% of the herders we interviewed did this. But drought reduces the price of animals while raising the cost of cereals. During normal times, a Chalbi herder’s 250 kg cow is worth 837 kg of cereals. In times of drought, the same animal may fetch less than one-third of this.

Other “distressed” mechanisms include slaughtering a young animal in order to save its more valuable mother, and depleting other productive assets (20% of our respondents said they did each of these). All in all, such mechanisms were surprisingly (and distressingly) common.

“Adaptive” mechanisms include moving in search of pasture and wa...
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Ways to create local resilience include joint efforts with the local communities and governments, planning for disaster-preparedness and response, and emergency funds. Since mobility is essential for pastoralists to manage risk, restricting it can leave them vulnerable to drought and other shocks.

Policies should support mobility of pastoralists rather than trying to restrict it, and should limit corporate investments which prevent pastoralists from accessing land. Policies should be harmonized between countries, neighbouring districts, or across the boundaries of national parks.

Basic human services

Pastoralist areas are often poorly served compared to other areas in the same country. In northeastern Kenya, for example, only one-third of primary-aged children are enrolled in school: half the national rate. Only a tiny minority of children attend secondary school. Few households have access to electricity, safe drinking water or pre-natal care. Only half the children are vaccinated. Similar discrepancies are found in other countries. A lack of government services means that development organizations (and occasionally private providers) have to step in. NGOs and faith-based groups offer extension services and run schools and clinics.

Health and education services are needed that are adapted to the mobile lifestyle of pastoralism. These services may be mobile themselves, or offered at convenient locations, for example, at different fixed sites in each season.

More effort is needed to promote their ownership of and access to means of production and their ability to make decisions, and to stimulate organizations that champion the interests of women pastoralists.

Local knowledge and institutions

Pastoralists have accumulated a wealth of local knowledge, traditions, types of organization, forms of dress and types of food that make them distinctive, and that are vital in enabling them to survive in a harsh environment. Pastoralists themselves recognize this: tradition, local knowledge, care of animals and social values all scored highly when we asked them what they associated with pastoralism. “Making a living” came top, though, emphasizing the economic aspects of pastoralism. Nonetheless, indigenous knowledge is disappearing fast, and it is one of the major values to be protected.

The cultural wealth of pastoralists should be recognized so as to limit their international marginalization. It can also be converted into economic benefits: ecotourism, the sale of handicrafts and fair trade of pastoralist products are all promising complementary sources of income when properly managed and owned by the community.

Culture is important in managing livestock and rangelands. Pastoral-
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Pastoralists have a deep knowledge of animal breeds, and know which types of animals are suited to which conditions. They have whole sets of rules and decision-making procedures on how to manage grazing; these are more important in guiding behaviour than the official rules. About one-third of the pastoralists we questioned said they had reciprocal grazing agreements with their neighbours, while only 5% knew about the official rules.

Development efforts should build on and support traditional pastoralist organizations. They should strengthen their skills in fundraising, lobbying and advocacy, organizational governance and gender issues. Support is also needed so these organizations can communicate with each other and coordinate their activities.

Social capital

Groups and communication
Pastoralists engage in a variety of social groups and networks, including elders’ councils and other groups dealing with topics such as rangeland management, savings, marketing and religion. Some of these are highly effective, but they tend to be local and small-scale. Such groups are the main way pastoralists communicate and engage with the local and regional authorities.

Face-to-face meetings remain the most important way that herders get information from their peers, extension workers and NGO staff. They are followed in importance by radio, and then by mobile phones, which are revolutionizing communication in pastoralist areas. Herders use their phones to get information on prices and potential customers, and to send and receive money. Other promising services are emerging: weather information, monitoring livestock health and insurance schemes.

A combination of investment in mobile technologies and apps, and in the physical presence of change agents in the field, could help fill the information gap that many pastoral communities face.

Business and extension services
Businesses rely on a large number of services in order to function. Pastoralism is no exception, but sparse populations, remoteness and herders’ mobility make providing such services difficult. According to our informants in 26 countries, the most common services are vaccination, public and private extension services, meat inspections and veterinary certification. Marketing services (holding grounds, slaughterhouses) were less widely available, while financial services (credit, credit guarantees, insurance) were the least common.

Public services are poorly linked with pastoralists (see below under “Political capital”). Civil-society organizations, pastoralist associations and the private sector are regarded as more transparent than national or international organizations.

One solution is to identify and work with change agents (such as veterinary personnel) who can connect pastoralist households, community leaders, service providers and policymakers. Another is to decentralize services to local authorities and community groups, and to explore the possibility of using private entrepreneurs to deliver public services.

Animal health
Animal-health services are extremely important to pastoralists. They are delivered by traditional practitioners, community animal-health workers (who in the hotspots we surveyed are popular but under-supported), veterinarians (vital but scarce), drug suppliers. Animal-health services include cold chains, vaccinations, inspection systems, quarantine regulations and food-safety standards that enable livestock products to be traded on national and international markets.

According to the survey, only 42% of respondents stated that the majority of drugs were obtained through formal channels, which may increase the risk of incidence of fake, expired, incorrectly handled, or incorrectly used drugs. Reliable suppliers are rare: 40% of our respondents said there was no veterinary pharmacy in their area.

Investments in animal-health services are extremely important to pastoralists, not only to protect their livestock assets but also because such services are often the only link to public institutions. As with other services, animal-health services need to be adapted to the herders’ mobile lifestyle. As potential change agents, animal-health service providers can bridge the gap between pastoralists households with policymakers. Animal health services are in high demand in pastoralist societies. We need to find ways to enable pastoralists, the private sector and public services to work together to fill gaps in coverage.
Food safety
Pastoralists are major suppliers of animal products in domestic markets and in neighbouring countries. For pastoralists to expand their market opportunities, they must comply with food safety standards for animal health, feeding and traceability (the Codex alimentarius). Such standards are difficult to fulfil in a pastoralist environment.

- Options are including pastoralist-friendly passages in the standards, building slaughterhouses that produce quality products that are easily tradable (such as deboned meat), and harmonizing national and regional specifications for animal health.

Conflict and insecurity
Conflicts are common in pastoralist areas, and they are often (though not always) over natural resources. Climate variation and climate change may trigger conflict by forcing herders to move into new areas in search of pasture or water.

- Improving pastoralist livelihoods and developing grazing plans in a participatory way with neighbouring communities can help avoid conflicts.

Insecurity can make large areas unsafe for grazing; fearful for their lives and their animals, herders take their livestock elsewhere. Remoteness, a lack of government control, conflicting tribal loyalties and a sense of neglect make pastoralist areas attractive for insurgencies. For young men with few economically viable alternatives, joining a militia can be an appealing career option.

- Pastoralism itself is a way to manage remote and difficult areas, keeping them inhabited, productive and secure, and reducing opportunities for banditry, trafficking and insurgency.

Political capital

Land rights and tenure
Land tenure is one of the main challenges pastoralists face and is the root of many conflicts. Rules on land tenure vary widely among countries, but most formal legal systems do not recognize or guarantee customary tenure rights. In our survey, 42% of the pastoralists said they owned land individually, while another 15% said their community owned it. But formal titles are rare: only 15% of the individual owners and 6% of the community owners had formal titles. Customary ownership is far more common.

In the past, this lack of formal rights did not matter: outsiders regarded pastoral land as of little use. But this has changed: the discovery of oil and minerals, the expansion of cropping and the designation of nature reserves and wildlife parks have boosted interest in pastoralist areas. Such uses often occupy the best-watered land, cutting off herders’ access to pastures and water sources they rely on in the dry season. Governments promote outside investment, but ignore the rights of pastoralists, who are branded as criminals or forced into ever-drier and more remote areas. This was especially the case in the Latin American hotspots, where indigenous and peasant movements struggle for land rights and against land grabbing, mining and agribusiness expansion.

- The most promising avenue seems to be to recognize and protect customary land-tenure rights, traditional rules and rangeland management norms. Communities (rather than individuals) should be able to formalize their customary tenure.

Policies
Policies that deal specifically with the pastoralist sector are relatively rare (the African Union’s Policy Framework for Pastoralism is an exception). Many of the policies that affect herders deal with other areas and population groups too. That means they are often poorly attuned to the situation in pastoralist areas.

Ministries of agriculture and livestock are responsible for most policies that affect pastoralists. Our respondents regarded some policies as contradictory, especially those governing mobility, where a single ministry is involved. Strangely, where ministries are required to collaborate, such as in animal health and food safety, they saw fewer contradictions.

Even if a policy exists, it may be weakly enforced or poorly coordinated among different branches of government. But where more powerful ministries such as the prime minister’s office or the
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Ministry of the interior are involved, the policies may be more effective. Most policies are based on prohibitions and rules, rather than on trying to stimulate good practices.

Suitable policies are needed in a wide range of areas: service provision, natural resource management, disaster risk-reduction, safety nets, market integration, grazing agreements, security, and transboundary communities and diseases. The best option seems to be to decentralize policymaking wherever possible to local authorities and community organizations, and to ensure that pastoralists and their organizations have a voice in the decisions made.

Empowerment

Pastoralists are marginalized in most parts of the world. While governments increasingly recognize the value of pastoralism, many still regard it as backward and as a threat to national security; some ministries or policies still try to lure (or even force) pastoralists into permanent settlements. While pastoralists want their voices to be heard, they are not given the opportunity for this, and they lack the ability or the tools to organize themselves to gain political influence.

Pastoralists say they are rarely consulted on policies that affect them. This may be because the issues (for example in food safety) are technical in nature, policymakers are unwilling to subject drafts to scrutiny by advocacy groups, or pastoralists are poorly organized politically. Parliamentary groups have appeared in some countries (Ethiopia, Kenya, Uganda) to press for pastoralists’ interests at the national level. This is a welcome development, but such groups are often weak and ineffective. Some members have limited education, so lack the knowhow and skills needed to work on policy issues. Others belong to an emerging “pastoral elite”: they have a pastoralist background but have become separated from it. Such elites may capture many of the benefits of measures intended to benefit pastoralists, leaving poorer members of the community untouched or worse off than before.

Helping pastoralists organize to express their own interests is vital if their voice is to be heard. Civil society organizations and their networks should be strengthened at local, national, regional and international levels to engage in policy dialogue and help design projects that benefit pastoralists.

Cross-border issues

National boundaries were often drawn through sparsely populated, pastoralist areas, and cut across traditional ranges or migration routes. That brings with it a series of problems: national authorities may not recognize traditional rights, and regard cross-border movements and trade as smuggling. Governments on both sides of the border are suspicious of “foreigners” and are reluctant to support them; collaboration between governments is often cumbersome. Organizations that offer relief or development assistance find it difficult to straddle a border. Local conflicts between groups on either side of a border may easily lead to international tensions.

Nonetheless, cross-border cooperation is crucial for a variety of reasons: to promote trade, facilitate movement, control transboundary diseases, mitigate conflict, etc. Cross-border issues are often best dealt with through contacts between customary authorities, pastoralist representatives and local authorities on either side.

Conclusion

Pastoralism is vital for the livelihoods of millions of people, and it remains a valuable and sustainable way to manage large areas of land with few other options. Rather than regarding pastoralists as a problem, policymakers should see them as a major and indispensable contributor to the development of sparsely populated, marginal areas. Efforts to develop pastoralism need to be focused on the local area or territory, rather than on national-level policies. They need to take the community capitals into account and build on them, and especially on the pastoralists’ own knowledge, organizations and social networks. They should make use of change agents that can span the gap between the local and national levels, connecting pastoralist communities with development agencies, the private sector and policymakers.
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