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PASTORALISM IN AFRICA

A Primer

USAID
FROM THE AMERICAN PEOPLE

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PASTORALISM IN AFRICA: A PRIMER

Pastoralism in Africa is practiced by some of the most marginalized and underserved populations on the continent yet generates substantial—but often hidden—economic benefits. It is one of the most researched livelihood systems in Africa but is often hindered by policies and programs that are not guided by evidence and that overlook the knowledge and aspirations of pastoralist peoples.

This primer on pastoralism in Africa provides basic information on the core aspects of pastoralism as a livelihood and production system. It is designed for personnel at United States Agency for International Development (USAID) and its partners with limited or no prior experience of African pastoralism, and it covers aspects that newcomers can find counterintuitive. Section 1 of the primer describes the ecological reasoning behind pastoralism in Africa, its productive efficiency, and its contribution to national economies. Section 2 describes the challenges facing African pastoralism, and the implications of trends such as livestock commercialization and declining access to rangeland. The primer is accompanied by six briefs that provide more detailed information on specific topics: gender, markets, conflict, land, water, and climate.

The primer is aligned to the USAID *Policy on Promoting the Rights of Indigenous Peoples* (Pro-IP), which calls for strengthened engagement with indigenous groups and concerted efforts to advocate for and exercise their rights. The primer is also aligned to the African Union's *Policy Framework for Pastoralism in Africa*, which highlights the economic, social, and cultural contributions of pastoralism to the continent's development. This policy also recognizes the ecological and economic rationale for pastoralist livestock systems and the critical importance of mobility to enable these systems to function.

1. WHAT IS AFRICAN PASTORALISM?

Defining pastoralism

Pastoralism is a specialized livelihood system quite unique in its ability to use natural environments characterized by unpredictable variability to make a living through the rearing of livestock, often combined with other economic activities. The definition used by the Government of Kenya in its national policy on arid and semi-arid lands neatly captures its key features of specialization (Box 1). Pastoralists have institutions and strategies such as strategic mobility, and reciprocal and controlled grazing arrangements, to take advantage of the variable, scattered, and highly unpredictable opportunities that the rangelands can provide. Their nature-based management strategies protect rangeland plant species diversity and tree cover, facilitating biodiversity and optimizing the health and productivity of their livestock and the rangelands that sustain them.

Box 1: Defining pastoralism

The term refers to both an economic activity and a cultural identity, but the latter does not necessarily imply the former. As an economic activity, pastoralism is an animal production system which takes advantage of the characteristic instability of rangeland environments, where key resources such as nutrients and water for livestock become available in short-lived and largely unpredictable concentrations. Crucial aspects of pastoralist specialization are: (1) The interaction of people, animals and the environment, particularly strategic mobility of livestock and selective feeding; and (2) The development of flexible resource management systems, particularly communal land management institutions and non-exclusive entitlements to water resources.

Source: Republic of Kenya, 2012.

In Africa, pastoralism is practiced in some of the most challenging, as well as rich and fertile, environments,[1] and pastoralists can be found across the whole continent from the mountains of Morocco and Algeria to the rangelands of the Sahel and Rift Valleys in East Africa, to the forests of Guinea and central Africa and the savannahs of southern Africa. However, pastoralism is most prevalent in dryland environments, especially arid and semi-arid areas.[2]

The diversity of pastoral systems in Africa reflects the complex interactions between humans, animals, and the environment, and highlights the need for context-specific approaches to pastoral development and policy. Some communities specialize in the rearing of single species and breeds, highly adapted to thrive in their environments, such as the WoDaaBe with their distinctive Bororo zebu breed of long-horned cattle. Other pastoralists such as the Maasai and Somali specialize in mixed herds with a diverse portfolio of cattle, camels, sheep, and goats. Donkeys are also reared in many pastoralist societies and are particularly important for women for the transportation and carrying of water and firewood.

Crop farming has always been a feature of many pastoral production systems in Africa, typically as a complementary activity to livestock, which remains the core economic and social asset of the household.

1 Pastoralism is practiced not just in Africa but on every continent except Antarctica. See http://umap.openstreetmap.fr/de/map/a-map-of-pastoralists-worldwide_563977#2/0.2/0.2.

2 Technically, drylands are defined by an aridity index of < 0.65. Aridity index is the ratio between annual rainfall and annual potential evapotranspiration. There are four dryland sub-systems: hyper-arid lands with an aridity index below 0.03, arid lands (0.03–0.20), semi-arid lands (0.20–0.50), and dry sub-humid lands (0.50–0.65) (Njenga et al., 2014). However, this definition—based on annual averages—has important limitations for determining the suitability of drylands for agricultural production, because it ignores the critical role of the distribution of rainfall (in particular) in time and space, in supporting plant growth. This is discussed in more detail below.

A Kenyan pastoralist provides water for her animals at a water point in the Mukogodo Forest, in Laikipia County. Photo credit: FAO/Luis Tato

Consequently, many pastoralist households move in and out of crop production depending on circumstance. It was only in the 1970s and 1980s that pastoralists began to be categorized by development practitioners and policy makers as either "pure pastoralists" or "agropastoralists"—the latter reflecting a policy environment that increasingly sought to sedentarize pastoralists and turn them into crop farmers following the devastating droughts of 1973 and 1984.[3] Agropastoralism, however, is not a concept or category used by pastoralists to define themselves even if they turn to crop farming on a regular or periodic basis.

Whereas a study by the Food and Agriculture Organization (FAO) estimates that pastoralism supports the livelihoods of over 50 million people in Africa,[4] the African Union estimated the number of pastoralists at 268 million.[5] This wide variation in the estimates reflects the challenges of counting pastoralists due to their mobility and reluctance to participate in censuses. Estimates may also vary depending on the definition of pastoralism

3 Sedentarization has been a major policy objective of many African countries since independence as a means to integrate pastoralists into the dominant agricultural or industrial systems and align them with a market-oriented way of life; to permit easier State administration, taxation, and control; as a means to promote peace when mobility is perceived to trigger conflict; to improve access to education, healthcare, and markets to reduce poverty; and as a strategy for security and counterinsurgency purposes.

4 Rass, 2006.

5 African Union, 2010.

Baggara in Darfur, Sudan. Photo credit: Sue Cavanna

used as well low response rates, data quality issues, and the lack of a consistent and standardized approach to collecting this type of information.

Despite decades of research and a plethora of policies and pastoral development programs designed to improve pastoral livelihoods, pastoralism remains one of the least understood and poorly supported livelihood systems in Africa. This paradox is in part due to the failure of development policy to keep pace with scientific understanding of the drylands as environments that are inherently variable and unstable.

Policy limitations

Over the last 30 years there has been a significant shift in scientific understanding of the drylands as environments where unpredictable variability in resources is not an anomaly or a disturbance, but rather the norm. Where uncertainty is the only certainty. This understanding, however, has not yet permeated development and climate policy and practice. These have, and continue to be, framed by narratives based upon a presumed limitation of the natural resource base due to variable and low annual rainfall.[6] A limitation that emphasizes scarcity, fragility, and degradation that limits productivity, compelling pastoralists to overgraze their land, thereby exacerbating scarcity and degradation, further reducing productivity and triggering conflict and migration. Such

6 Hesse, 2011; Krätli, 2013; Shanahan, 2013.

narratives justify interventions to "modernize" pastoralism based on western modes of animal husbandry, seeking to eliminate variability from the production process, often through costly and unsustainable investments in imported technology and infrastructure (e.g., commercial ranching, irrigated fodder banks). The climate crisis has given new impetus to these views emphasizing pastoralists' vulnerability due to their dependence on an increasing variable and unpredictable natural resource base.

However, whether variability is a constraint to productivity or not depends on the strategy of production. For large-scale agricultural production, for example, the variability of rainfall, soil nutrients, and topography are limiting factors where a uniform and stable environment is needed to ensure stable and predictable productivity (e.g., flattening landscapes, using chemical fertilizers and irrigation systems). But in contexts where variability and unpredictability are inherent, these approaches to controlling the natural environment are often expensive, with many costly externalities. If allowed to function according to its logic, pastoralism can use the erratic variability of the drylands as an asset, which has been a challenge for many modernized agricultural systems.

Drylands are highly variable environments

To understand the rationale underpinning pastoralism, it is necessary to understand the dynamics of natural pastures—grasses, shrubs, tree leaves, and pods—the major source of feed and nutrients for livestock in pastoral systems.[7] In the drylands, the availability and duration of nutrients across the rangelands are highly variable and unpredictable. This variability and unpredictability arises not only because of irregular rainfall patterns but also from variations in topography, soil composition, plant species, and even the growth cycle stages of individual plants.

Rainfall in the drylands is highly localized in space. This means that pastures do not grow evenly over the rangeland during the rainy season. Rainfall is also highly variable in time. This means that pastures do not grow everywhere at the same time. And because rainfall is highly variable and scattered in time and space, the quantity of available pasture is also highly variable and scattered in time and space across the rangeland. Grass will be at different stages of growth in different areas throughout the rainy season.

But it is more complicated. Even if total annual rainfall is roughly the same from one year to the next, it is not necessarily the case that the same amount of pasture will be produced from one year to the next. This is because rainfall in the wet season comes in a "start-stop" fashion (i.e., it does not rain every day). And when it rains, some rains are more useful for the reproductive cycle of plants than others (i.e., rainfall events can be more or less intense). The seeds of different plant species react differently to different rainfall conditions: for example, in drier years short-cycle annual grasses will dominate pastures, but when there is increased rainfall, perennial grass species will return. Likewise, formerly "bare" areas, often perceived as degraded, regenerate under improved rainfall conditions, with dormant seeds germinating in response to greater humidity. It is this capacity of the dryland ecosystem to adjust to changing conditions while maintaining its functional integrity that classifies it in ecological terms as unstable but resilient.

More significantly, the distribution of nutrients from plants in the rangelands is greatly impacted by variable rainfall. Due to the irregularity of rainfall in time and space, pastures are at different stages of their growth cycle in different areas of the rangelands. The nutrient composition of plants changes as they progress through their life cycle.[8] Generally, young plants have a higher nutrient content and are more digestible than mature

7 Crop residues, harvested hay, or industrial feed supplements (e.g., cotton seed cake) will improve livestock diets, but pastoralists often face barriers in accessing these resources.

8 Ball et al., 2001.

Spatial rainfall in Niger. Photo credit: Marie Monimart

plants. For example, young plants tend to have higher levels of protein, energy, and minerals, whereas mature plants tend to have more fibrous material and lower protein and mineral content. In addition, the stage of plant maturity can affect the palatability of the plants for livestock. Young plants are often more tender and palatable, which can increase livestock intake and improve their diets. Conversely, mature plants may be less palatable and can result in lower feed intake and reduced nutrient availability. The nutritional quality of dry season pastures also varies from year to year depending on when the plant's life cycle was halted when the rainy season ended. Consequently, the distribution of nutrients across the rangelands is not evenly distributed and is in constant flux, not only over the course of the rainy season but also from year to year.

Further complexity is introduced due to the many different soil types in the rangelands and different topographies.[9] This creates "micro-environments," all supporting different species of pasture, each with distinct growing cycles and different nutritional qualities and palatability. Finally, the nutritional quality of pastures also varies daily, with plants exhibiting a higher nutrient content at night following a day of photosynthesis.[10] Therefore, the nutritional value of pasture in any given area on any given day is dependent not only on plant species but also on the timing of grazing.

9 Boran pastoralists from Isiolo County (Kenya) identified 24 different soil types in their rangelands. Source: Resource atlas of Isiolo County, Kenya, p.24 http://site.adaconsortium.org/wp-content/uploads/2022/09/Resource_Atlas_of_Isiolo.pdf

10 Maryland et al., 1998.

The significance of environmental variability for resilience[11]

The climatic variability of pastoral rangelands is its most dynamic and positive element. The dryland ecosystem responds to scattered and unpredictable rainfall by creating areas of abundance that are unpredictable and ephemeral. And for pastoral production systems, whether livestock receive nutritious or poor diets (which impacts on the productivity of the herd) depends on ensuring the livestock can access pastures when their nutrient content is at its peak.[12]

Pastoralists are specialized dryland producers who match the variability in availability of nutrients and other resources such as water with variability in their livestock production strategies. In this manner they "work with variability" rather than against it. And rather than just seeking to minimize the effects of variability (e.g., coping with the situation), they actively seek through their production strategies to take advantage of the variable distribution of resources to enhance productivity, thereby building resilience in contexts of high variability. To understand why vulnerability occurs in pastoral systems, it is important to distinguish between those risks that are inherent to and managed by the system, and induced vulnerability resulting from external factors, such as inappropriate policies and practices that undermine pastoral systems and the proper functioning of their strategies.[13]

Strategic mobility is the most obvious example of how pastoralists match the variable and unpredictable distribution of nutrients and water in the rangelands in their production strategies.[14] The commonly held belief is that pastoral mobility is a strategy used to deal with pasture shortage. However, pasture shortage is not the main reason why pastoralists move their animals. The primary concern of pastoralists is the quality of their livestock's diet, which is why they usually move towards pastures of higher quality rather than away from pastures of low quantity. Highly nutritious pastures result in livestock that produce more milk with a higher fat content, gain weight more quickly, reproduce faster, and are generally healthier. During the rainy season, animals must be fed particularly well with the high-nutrient fresh grass to maximize weight gain so that they can survive the inevitable weight loss during the dry season.

Contrary to popular belief that pastoralists "roam around," they plan their movements with the utmost care, as recognized by the African Union in its Policy Framework for Pastoralism (Box 2). Pastoralists

Box 2: The importance of strategic mobility

The African Union Policy Framework for Pastoralism in Africa is explicit in its support to pastoral strategic mobility. It recognizes that mobility is the basis for efficient use and protection of rangelands, and, that mobility is key to appropriate adaptation to climatic and other trends. The principle is reflected in the practical strategies of the framework, such as securing access to rangelands for pastoralists through supportive land tenure policies and legislation, and further development of regional policies to enable regional movements and livestock trade.

Source: African Union, 2010, 22.

11 Krätli, 2015 provides an excellent overview.

12 A study looking at this issue in terms of the ecology of populations of wild ungulates in the Sahel found that "wild ungulate populations migrate to make use of nutritious but very seasonal food supplies. In doing this, they maintain a higher population size than they could as sedentary populations" (Sinclair and Fryxell, 1985, 987).

13 According to a director for policy at the USAID Bureau for Food Security, "It is not drought, but vulnerability to drought that is eroding food security in [the drylands of Somalia, Ethiopia, and Kenya] and this vulnerability is a result of chronic underinvestment" (Tran, 2011 quoted in Krätli et al., 2013).

14 Mobility is also important to avoid or minimize the impacts of problems such as drought, disease, or conflict while seizing the opportunities of volatile livestock markets to sell animals when prices are good.

Case study: Customary institutions have tested mechanisms to manage seasonal variability and drought

In Isiolo County in Kenya, Boran pastoralists manage access to grazing areas and water through customary institutions. Management of grazing resources is principally done by the *jarsa dedha* (council of elders). The *jarsa dedha* make decisions on community mobility, primarily concerning seasonal movements from wet to dry season grazing grounds, and on the opening of boreholes in the drought reserve to livestock.

The *jarsa dedha* are responsible for ensuring that animals move out of the dry season grazing areas and drought reserves during the wet season. This allows the pastures to grow in these areas, thereby building a "fodder bank" for later use. The date of entry into dry season grazing areas and drought reserves is decided by the *jarsa dedha*, based on the condition of the surrounding pastures. The *jarsa dedha* also manage stocking levels on the rangelands during the dry season to ensure a balance between the numbers of livestock and the availability of pasture until the arrival of the next rainy season. This is done by regulating the number of animals that access water in the dry season grazing areas and drought reserves. Movement of livestock between different *jarsa dedha* must be prearranged with the respective council of elders, who assess whether there is sufficient water and grazing resources.

The Boran also have institutions for managing access to water. All wells have an owner known as *aba ella* or *aba qonfi*. This owner is usually the most senior descendent of the man who first dug the well. He and his clan have "first rights" to the well. The use of water from wells and dams is coordinated at the community level by the *aba erega*. They decide on the watering rotation at each water source. The *aba erega* comes from among the local council of elders (*jarsa dedha*).

Different types of water sources are subject to different forms of management. The most intensive management occurs during the dry season at deep wells or boreholes. Due to the strategic importance of these resources, management falls to the *jarsa dedha*. The use of shallow wells is tightly controlled by both the *aba ella* and *aba erega* working together. An *aba ella* assigns "first rights" to water, based on *konfi* (ownership) and *sunsuma* (clan membership and affiliation). If there is enough water, then "second rights" to the resource are decided by *aba erega*.

The Borana customs and culture define not only those who are entitled to access certain wells, but also the order of priority for watering animals among those with entitlement. Access to pastoral resources is thus negotiated and reciprocal, which gives a high degree of flexibility for pastoralists to respond to changing conditions in pasture and water availability due to seasonal rainfall. In this way they can ensure high productivity during the rains and minimize the loss of production, productivity, and assets during the dry season and drought events. However, although they are still functional, these institutional arrangements have been weakened in the county and need to be strengthened, or new hybrid institutional arrangements need to be developed where appropriate.

Source: African Union, 2010, 22.

improve the productivity of their livestock by strategically planning grazing routes at various scales in time and space to ensure that the animals ideally access those areas where pastures are at the peak of their nutritional content. At a larger scale, grazing itineraries involve moving animals to new pastures, often across ecological zones, based on interannual or seasonal changes. For example, in the Sahel livestock are herded south to coincide with the arrival of the rains and then led north following the rains.[15] This method allows the pastoralists

15 Schareika et al., 2000.

to provide their animals with a consistently nutritious diet from high-quality pastures, which would not be possible if they kept them in one place.

At a smaller scale, mobility involves planning shorter movements within the rainy season based on rainfall patterns or around permanent water points during the dry season. At the micro scale, a daily herding itinerary might be organized to lead animals to particular patches of nutritious or palatable pastures to maintain their appetite or to produce milk with a particularly high fat content.[16] Furthermore, in certain pastoral systems, such as the WoDaaBe in the Sahel, pastoralists selectively breed from animals that are skilled at selective feeding, meaning they can choose the most nutritious parts of a pasture and avoid the less desirable parts.[17]

Communal land tenure regimes and the practice of negotiated and reciprocal rights of access to resources, particularly pastures and water, are other examples of variability embedded in pastoral systems to match the variability of resources. While being a precondition for mobility, these institutions also enable pastoralists to seize unpredictable and often short-lived opportunities in a flexible and timely manner, which would not be the case under more defined and rigid arrangements such as private land and formal legislation regulating access to pastoral resources. The rearing of different species of livestock—another example of variability embedded into the pastoral production process—opens up greater grazing options, optimizing the use of pastures, as different species have different grazing habits and preferences. Additionally, raising different species can help diversify pastoralists' income streams, as different species may be more profitable in different markets or in different seasons.

Functional pastoral systems are highly productive in variable contexts

Although pastoralism is not inherently more productive than other livestock systems (e.g., ranches, stall-fed dairying), there is mounting evidence that in environments characterized by high variability, the more mobile the system, the greater the returns.

Productivity between highly mobile and less mobile pastoral groups

Research in Sudan in the late 1970s showed that the productivity of herds reared by the highly mobile Baggara pastoralists was greater than that of the more sedentary pastoral groups who permanently reside in the northern pastures around Nyala town in South Darfur (Table 1).

Table 1. Productivity of sedentary and mobile livestock in southern Darfur, Sudan (source: Wilson and Clarke, 1976)

Indicator	Sedentary herds	Mobile herds
Meat production per kg of breeding female	0.023 kg	0.057 kg
Calving rate	45%	65%
Total deaths	35%	15%
Calf deaths	40%	11%

This difference in productivity can be explained by the following factors:

- In the wet season, the Baggara herds follow the flush of fresh nutritious grass that accompanies the northward progression of the rains from South Sudan to Darfur and Kordofan States. The pastures in the

16 Meuret, 2014.

17 Krätli, 2015; IIED and SOS Sahel, 2009.

Tree fodder along temporary streams in wider dry system, Darfur, Sudan. Photo credit: Matija Kovač

north, despite receiving less rain, are far more nutritious than those in the south, and the animals quickly put on weight and produce more milk. At the end of the rains, the Baggara gradually move south, driving their animals to places where fresh new forage is sprouting along the edges of seasonal streams that are now gradually drying up. These areas also provide highly nutritious fodder from trees as well as the emerging "flood retreat" grasses (see photograph). Through this strategy of constantly "following the growth of fresh pastures," the Baggara maintain their animals on a near continuous diet of highly nutritious pastures.

- By contrast, the herds reared by the pastoralists who permanently reside in the northern pastures around Nyala town only benefit from nutritious pastures during the wet season. For the rest of the year, the animals are grazed on dry pastures of relatively low nutritional value, thereby reducing their productivity.

Productivity between pastoralism and ranching

Research has been carried out to compare the productivity of livestock reared under two different management systems with different objectives in the same dryland environment:

- **Pastoralism** with high mobility and few external inputs where livestock are reared for **livelihood objectives**—providing food, income from sales, savings, and insurance for the immediate and wider family.
- **Ranching** with limited mobility and high external inputs where single-species livestock (often cattle) are usually reared for **commercial objectives**—mainly beef production. See Table 2 for a comparison of ranching and pastoralism.

Table 2. Comparative output from settled commercial ranching versus mobile pastoralism

Productivity of pastoralism and ranching (ranching = 100%)		Units of measure
Ethiopia (Borana)[18]	157% relative to Kenyan ranches	Megajoules gross energy (MJGE)/ ha/year (calories)
Kenya (Maasai)[19]	185% relative to East African ranches	Kilogram protein production/ha/ year
Botswana[20]	188% relative to Botswana ranches	Kilogram protein production/ha/ year
Zimbabwe[21]	150% relative to Zimbabwe ranches	Zimbabwe dollars/ha/year

The research compared net outputs measured as food energy (calories), protein, or cash produced in one year by rearing livestock on 1 hectare (ha) of land under either mobile pastoral conditions or ranching. The results show that under similar dryland conditions, pastoralism is significantly more productive than ranching when measured on a per hectare basis. Reasons that explain the differences in productivity include:

- Ranches, as commercial businesses, seek to make a financial profit. Their management strategy is to control the factors of production in a dryland environment characterized by unpredictable, scattered, and variable resources. They do so by keeping relatively few animals of one species and sex (e.g., male cattle for beef production) in a fixed area of land at an "ecologically conservative stocking level" to allow for highly variable levels of pasture production, and thus nutrients, from one rainy season to another. They also provide external inputs such as water, veterinary care, and supplementary feeds. In this manner, they produce relatively few animals with good body weight that can fetch high prices on the market.
- Pastoralism, specializing in the use of variability, typically rears different species of livestock and uses mobility (i) to practice an "ecologically flexible stocking level" that allows practitioners to maximize the number of animals that can be supported in an area for a relatively short time without overgrazing the environment; and (ii) to maintain their animals on a near-constant diet of high nutrition during the wet season without paying for external inputs.[22] In this manner, pastoralists can rear a greater number of animals per hectare (subject to being mobile) and produce a wider range of benefits (milk, meat, insurance, etc.) than ranching from the rangelands. The ranch animals will have a lower body weight and will not fetch as high a price on the market.

If all the costs and benefits are considered and then compared **on a per hectare basis**, then pastoralism produces greater benefits than ranching. However, if animals reared on a ranch are compared with those under pastoral systems **on a per animal basis**, then those reared in a ranch will produce more meat or milk. However, the net cost of 1 kg of meat or 1 liter of milk from animals reared on a ranch is likely to be higher than that produced under pastoral systems.

18 Cossins, 1985.

19 Western, 1982.

20 de Ridder and Wagenaar, 1984.

21 Barrett, 1992.

22 External inputs are generally limited to some veterinary care (e.g., vaccinations), and possibly labor and supplementary feeding or minerals (e.g., salt).

Economic contribution of pastoralism to national and local economies

Pastoralism contributes significantly to national and regional economies in Africa. According to a study by the International Livestock Research Institute (ILRI), the economic value of pastoralism in Africa is estimated at US$1.3 trillion; this is equivalent to 30% of the continent's gross domestic product (GDP).[23] The study also found that the livestock sector accounts for up to 80% of the agricultural GDP in many African countries. Furthermore, pastoralism provides a source of income for millions of households in Africa.

In addition to its economic contributions, pastoralism plays an important role in preserving ecosystems and maintaining biodiversity. The grazing of livestock helps to prevent wildfires, control invasive plant species, and promote soil fertility, among other benefits. These systems are also recognized for their resilience to climate change. The increasing appreciation of their economic value is linked to the management of rangelands as ecological and political spaces, with extensive pastoral economies being the only systems capable of effectively managing such vast areas. The costs associated with securing "ungoverned spaces" are extremely high, as seen in the tragic situation in northern Mali.[24]

However, the economic potential of pastoralism in Africa is often limited by multiple challenges, including insecurity, rangeland fragmentation, inappropriate water development, land-use conflicts, and inadequate basic services. To fully realize the economic benefits of pastoralism, there is a need for policies and investments that understand and support pastoral production systems and pastoralists. These are discussed in more detail at the end of Section 2.

23 ILRI, 2015.

24 Ploch, 2011.

2. PASTORALISM IN AFRICA: COEXISTING GROWTH AND CRISIS

Development dilemmas

As explained in Section 1, African pastoralism is a diverse mix of highly evolved and adapted systems that use specialized forms of livestock production and strategic mobility. The productive capacity of these systems is illustrated by their substantial role in supplying livestock to domestic, regional, and international markets. For example, East African pastoralists are the main suppliers of animals to local markets, and some countries—notably Ethiopia, Somalia, and Sudan—are major livestock exporters. In 2010, the value of the East Africa livestock trade was estimated at US$1 billion per year, and this figure was expected to grow as demand for meat increased in expanding urban centers and among middle-class consumers. However, at policy levels this huge livestock trade is often poorly understood because much of it is informal and involves cross-border movements of livestock in remote and unregulated areas. See Box 3 for an example. Official market statistics rarely capture real trade volumes or prices, especially in areas with cross-border livestock trade movements. The livestock trade picture also varies between countries. For example, Kenyan pastoralists are major suppliers of livestock to domestic markets, but Kenya is also a net importer of pastoralist livestock, especially from southern Somalia.

Garissa livestock market, Kenya. Photo credit: Andy Catley

Box 3: Cross-border camel trade in Ethiopia to Sudan[25]

In 2011, USAID-funded research revealed an extensive and growing camel trade system that stretched for nearly 2,000 km, from pastoral producers in eastern Ethiopia to the far northwest of the country and into Sudan. This trade involved more than six ethnic groups and was served by 24 markets across Ethiopia. Within this evolving system, pastoralists were supplying camels in response to demands from farmers in mid-altitude areas of Ethiopia and increases in the market value of camels in Sudan. Although this trade evolved in the absence of government or aid programs, in 2010 it was valued at US$61 million. In comparison, the total value of formal cattle, sheep, and goat live animal and meat exports from Ethiopia in 2010 was around US$125 million.

Informal camel market, Ethiopia. Photo credit: Yacob Aklilu

Regardless of how pastoralist livestock trade is measured, some pastoralist areas in Africa can be viewed as regional economic hubs that are driven by livestock trade systems that reach far into neighboring countries and beyond. This activity can be summarized using **economic growth narratives** that position pastoralism as the driver of economic growth and local investment, and which over time resist conflict, climate trends, and weak governance. It is under this kind of narrative that development efforts around marketing and livestock disease control are often positioned, irrespective of their actual impacts.

The development dilemma for African pastoralism is that areas with impressive livestock trade activity are also characterized by very low human development indicators and high levels of human food insecurity and malnutrition. Income, health, education, and nutrition indicators are consistently lower in pastoralist areas relative to national averages. The dilemma becomes most apparent during periods of drought, when acute malnutrition peaks, large numbers of people need humanitarian assistance, and tv screens show the now familiar images of livestock carcasses and piles of food aid. In contrast to the economic growth narrative, this is the **pastoralism in crisis narrative**. The crisis narrative underpins policy and programs that aim to transform pastoralism into something else, especially systems of settled agriculture, irrespective of rainfall limitations and decades of failure.

Crisis narratives around African pastoralism are also linked to complex emergencies that are characterized by protracted conflict, and in some cases, cycles of retaliatory, violent livestock raiding and commercial raiding.

25 Aklilu and Catley, 2011.

Conflict between pastoralists and farmers is also a chronic problem, notably in West Africa. For some policy makers, pastoralism and the movement of people and herds in remote areas is seen as a cause of conflict, and so settlement and control of pastoralists are proposed to resolve conflict. To varying degrees, pastoralists are also caught up in new forms of conflict such as those associated with large-scale appropriation of pastoral land by the government for commercial agriculture, energy schemes, mineral extraction, and wildlife conservation, or internal disputes over territories and boundaries between local authorities. Notably, not all pastoralist areas are affected by severe conflict, and pastoralism is not a cause of conflict; much of the conflict in pastoralist areas is initiated by government actors and maintained by them for economic benefits.

Moving up-moving out

The moving up-moving out analysis explains why pastoralist areas of Africa experience simultaneous growth and crisis.[26] The analysis has two main components:

- First, understanding the different economic strategies used by households of different wealth status to acquire and build financial assets (livestock), including different livestock marketing behaviors according to wealth status;
- Second, assessing the impact of long-term trends that drive changes in asset (livestock) ownership from poorer to wealthier households, and a widening gap in the financial capital of poorer vs. wealthier households.

Household-level economic status and growth

For pastoralists, wealth is associated—logically—with the accumulation of livestock more than cash. This livestock-based growth is based on the high returns from livestock relative to cash, a natural resource base that supports livestock rearing and the limited financial services in pastoralist areas.[27] For poorer pastoralist households with fewer animals, the main aim is to build and save livestock as financial capital, and manage their animals to meet basic food requirements, e.g., to supply milk for household consumption. During this process, livestock sales are limited to meet immediate domestic needs. As livestock holdings increase, domestic needs are more easily met, and more animals become available for sale. A larger herd (greater financial capital) also offers some protection against hazards such as drought or livestock diseases:

> *Pastoralists appear generally to be unwilling to liquidate animals to the point that their herd size may prove insufficient to ensure household food security in the face of unknown conditions in the future.*[28]

If livestock ownership and growth among pastoralists is viewed from the perspective of an investment portfolio, the economic logic of their behavior becomes self-evident:

> *Karamojong (and other pastoralist) households manage their herds/flocks like an investment portfolio with a variety of assets. Their primary objective is to increase the value of the portfolio (in this case, the herd/flock). The income received from the portfolio is in the form of capital gains: a combination of increased asset values, and dividend income. Essentially, pastoralists do not derive income from the sale of animals. Instead, the sale of animals merely monetizes their income, converting capital gains into cash for one of two principal reasons:*

26 Catley and Aklilu, 2013.

27 For example, see McPeak, 2005.

28 Barrett et al., 2006.

To meet immediate cash needs*. Karamojong pastoralists sell animals to obtain cash for the purchase of staple grains, the payment of school fees, family obligations, and unanticipated expenditures such as medical expenses. This behaviour is well described in the literature. But it does not describe what is really happening. Livestock sold to meet immediate cash needs are generally surplus males and cull females (assets with limited future growth potential) whose sale has the least impact on the total value of the portfolio.*

To "trade up." *Pastoralists take advantage of opportunities to sell assets with low growth potential (slaughter bulls) and use the proceeds to purchase assets with high growth potential (heifers). This investment behaviour increases the overall growth potential of their livestock portfolio.*[29]

Critically, poorer pastoralists are not very responsive to market prices, and easier market access does not lead to increased sales of livestock. In the case of market prices, higher livestock prices mean that these households need to sell fewer rather than more animals to meet their basic needs and increase the value of their portfolio.

When pastoralists across Africa describe wealth and poverty, inevitably their views center on livestock ownership. Poverty is associated with a small herd, often comprising mainly smaller, lower-value livestock such as sheep and goats. Wealth is associated with a large herd, especially if it includes larger, higher-value species such as camels and cattle. Specific numbers and types of livestock are assigned to specific wealth groups. Comparable to these descriptions is the concept of a "minimum herd," which is the minimum number of animals that a household needs to own to function as a pastoralist household, independently of nonlivestock sources of food and income. Without a certain number of mature female animals to produce milk for consumption and offspring for sale (to buy cereals for consumption), a household needs to find food and income from other sources. A minimum herd can be considered a minimum portfolio, which poorer households aim to acquire.

These aspects of pastoralist household economies explain why livestock marketing in pastoralist areas is highly differentiated by wealth status. For example, in northern Kenya and southern Ethiopia, better-off households sold 26 times and 18 times more animals than the "very poor" respectively (Table 3). The main pastoralist suppliers of livestock to local and international markets are relatively wealthy households.

Table 3. Annual pastoralist household income from livestock sales in selected areas of Ethiopia, Kenya, and Sudan[30]

Area, country	**Income from livestock sales, by wealth status (US$) (equivalent number of sheep or goats)**			
	Very poor	**Poor**	**Middle**	**Better-off**
Mandera, Kenya	105 (3.5)	229 (7.5)	702 (24)	1,787 (60)
Wajir, Kenya	42 (1.5)	169 (5.5)	677 (22)	1,105 (37)
Teltele, Dillo, and Dier, Ethiopia	114 (5)	202 (8.5)	714 (31)	2,100 (92)
Borana-Guji, Ethiopia	132 (5.5)	231 (10)	768 (34)	1,500 (66)
North Darfur, Sudan	-	115 (4)	615 (21)	-

29 Rockeman et al., 2016.

30 Aklilu and Catley, 2009.

Long-term trends and impacts

The key long-term trends in the moving up-moving out analysis are:

Human population growth
Assuming a 2.5% annual increase in population, populations double every 30 years or so. In general, the environment and ecology of pastoralist areas limits the growth of livestock populations, as does commercialization (see below).

Droughts
The impact of drought is to cause substantial loss of livestock through starvation and dehydration. Although drought affects the livestock of all pastoralist wealth groups, poorer households with fewer animals are more at risk of losing livestock to such a degree that they are pushed out of pastoralism. Wealthier pastoralists are more likely to have access to private land for grazing or private water sources during drought, and they are more able to use strategies during drought such as trucking livestock to other areas. The rebuilding of herds after drought can take many years, and during this time, pastoralists often experience further droughts, or shocks such as livestock disease outbreaks, that hinder herd growth.

Commercialization
As outlined above, African pastoralists are key suppliers of livestock to domestic, regional, and international markets. In many areas, pastoralists have been responsive to market demands over time and have adapted their herd composition and management practices to supply markets. The demand for meat and milk is increasing in line with the growth of towns and cities, economic trends, and increasing numbers of middle-income consumers. However, as noted above, it is wealthier pastoralists who supply most of the livestock to markets, and as this practice develops, various changing behaviors become evident. These include the appropriation of hitherto communal land and water for private use, especially during critical dry seasons. In contrast, poorer households become increasingly isolated from these resources, which further hinders their capacity to maintain or build their herds. Commercialization is also characterized by wealthy "absentee" livestock owners who manage their herds remotely, e.g., using contract herders.

Declining mobility and access to rangelands
Effective pastoralism requires access to rangelands and flexibility to move herds to areas of good grazing and water. Yet pastoralists throughout Africa face worsening access to land due to a wide range of formal and informal barriers, sometimes leading to large-scale appropriation of land (Box 4). These barriers exist in multiple configurations within and between pastoralist areas and countries.

When combined with the livestock-based growth strategies of households by wealth status, these trends lead to a gradual shift of financial assets, i.e., livestock, from poorer to wealthier households. During drought, not only are the wealthy better able to withstand drought because they have more animals, they are also more likely to have access to their own, private dry season pasture and water. Over time, the market demand for meat and milk increases in line with the growth of urban and middle-class consumers. In simplified terms, the poor fall out of pastoralism and become destitute; the wealthy stay in pastoralism, adopt more commercialized approaches, and supply markets. The asset gap between the two groups increases over time, making it more difficult for the poor to return to pastoralism. Increasing numbers of people become caught in a poverty trap.

For those moving up, and over the long term, government neglect of pastoralist areas has not been a major hindrance as their herds grow and as they take personal control of natural resources. However, for those moving out or facing destitution, the weak development of pastoralist areas in terms of education, health, infrastructure,

Box 4: Policy and institutional barriers to pastoralist mobility[31]

- A long history of land legislation that recognizes or prioritizes agricultural land over rangeland, positions rangelands as unoccupied or nonproductive, and incorrectly assumes that alternative land uses are more rational and productive. There are many variations of this general theme, including disconnects between national constitutions and laws or different bodies of law. Outcomes include large-scale government appropriation of rangelands, including critical dry season grazing areas, for agricultural development; and favoring of irrigated agriculture by governments, with either local or foreign investments. Vested interests are often at play;
- Related to the above, the issue of pastoralist representation in dialogue on land policy and legislative reform, which relates to the wider constraint of the political marginalization of pastoralists in many countries;
- The limited recognition of customary institutions and in some cases, the declining influence and relevance of these institutions;
- A deeply entrenched perception among central policy makers that mobility is inherently backward, and for example, makes pastoralists more difficult to administer and service; centrally, modernity is not associated with mobile communities; government programs aiming to settle pastoralists, explicitly or indirectly;
- Weak or absent policies on pastoralism and the development of pastoralist areas; where livestock policies exist, specific support to pastoralism is often lacking;
- Disconnects between the progressive policies on pastoralism of the AU [African Union] and some Regional Economic Communities (RECs), and national policies; although regional policies are "signed off" by Member States, the AU policy support to pastoralist strategic mobility is often absent from national policies;
- Encroachment of rangeland by woody plants; a 10% increase in bush cover reduces grazing by 7%. Related policy barriers include government bans on the use of fire to control bush encroachment;
- Changing administrative boundaries within countries, e.g., a nonpastoralist district might expand into a neighboring pastoralist district;
- Central government concerns that cross-border movements and livestock trade are illegal—but further disconnects with the objectives of RECs and the principles of the free movement of goods, services, and people;
- State-instigated conflict affecting pastoralist areas; e.g., competition between local governments over land, markets, or customs points;
- Unresolved ethnic conflicts by the state, leading to "no man's land" acting as an unused land buffer between ethnic groups;
- Weak or new local administrations that tend to mirror the political behavior of central government, and encourage rent seeking;
- Local appropriation of land by government officials and elites, including wealthier pastoralists and traditional leaders;
- Weaknesses in land use planning, including urban expansion;
- Fixed-point provision of health and education services, which do not take account of mobility;
- Limited or no policies or programs to control invasive plants, or at least do this effectively;
- Inappropriate water development; e.g., positioning of wells or boreholes;
- Widespread misunderstandings within governments, academia, and aid agencies on the reasons behind pastoralist mobility, and the ecological and economic benefits.

and security has serious implications. A symptom of this underdevelopment is increasing numbers of pastoralists being forced into diversified or alternative livelihoods. In East Africa, large-scale social protection programs now exist in some countries as governments struggle to deal with increasing numbers of people with few or no livestock, limited education, and poor health status.

31 Catley, 2017.

Case study: Moving up-moving out in Somali Region, Ethiopia

Research with Somali Issa pastoralists in Ethiopia included collecting information on livestock herd size and composition by wealth group for two time periods: 30 years before 1974 and 30 years after 1974. 1974 was a year of particularly bad drought and famine and therefore, easy to recall as a point of reference among informants.

Relative to the period before 1974, the post-1974 period was characterized by:

- The appearance of two new wealth groups that informants described as "very poor" and "poor," both with very low livestock ownership. These households are caught in a poverty trap;
- Increased herd sizes for the "medium" and "wealthy" groups. There was notable increase in the ownership of camels, which are the most valuable livestock species. These households are "moving up" and are the main suppliers of livestock to markets. See Figure 1.

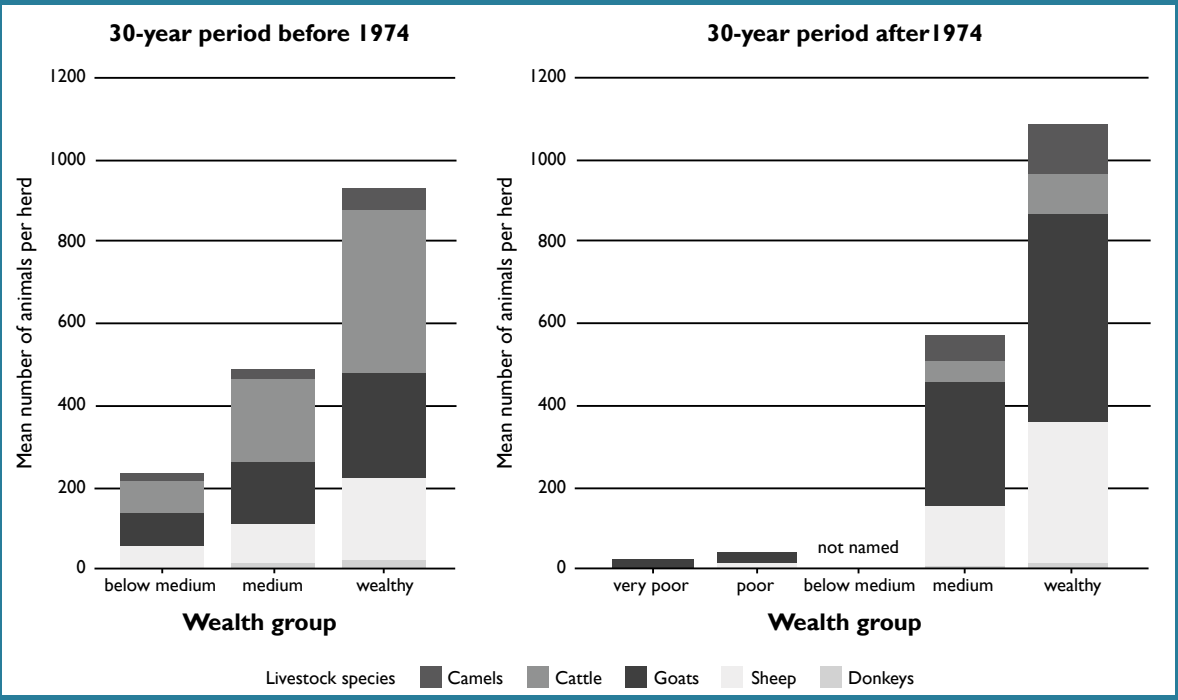

Figure 1. The "moving up-moving out" scenario: trends in livestock ownership by wealth group over 60 years (1944–2004), Shinile Zone, Somali Region, Ethiopia.[32]

Diversified and alternative livelihoods

Pastoralists have long diversified their livelihoods when opportunities arise, including investing in education with an expectation that future wages and remittances will support household economies. Following drought and loss of livestock, pastoralists also use temporary diversification to acquire enough income to restock and rebuild

32 Catley and Iyasu, 2010, using data adapted from Kassahun et al., 2008.

herds. For example, following drought in Niger between 1968 and 1974, many Wodaabe herders were forced to become migrant laborers.[33] Diversified activities and alternative livelihoods are defined as:

- *Diversified activities* are viewed as activities that are used to complement the core livelihood activity (whether real or aspirational); for pastoralists these diversified activities can relate to, or add value to, the core business of livestock production or can be quite separate, nonlivestock-related activities;
- *Alternative livelihoods* refer mainly to people moving out of pastoralism; it includes a shift to settled agriculture, as well as various employment and other opportunities in urban areas within and outside of pastoralist areas.

In general, diversification activities among pastoralists can be categorized as "positive" or "negative."[34] Positive diversification leads to relatively high, predictable, and safe income, without damaging local environments or cultures, and has a positive or neutral impact on pastoralism. However, many positive diversification pathways are determined by a household's wealth (including livestock assets), proximity to urban centers, markets, and services, and social and political capital. These pathways are also usually more accessible to men and boys relative to women and girls. In contrast, negative diversification has harmful environmental or social consequences, places people at risk of violence, sexual abuse, or other types of harm, or adversely affects the livelihoods of others, e.g., crime. Negative diversification is often associated with low household wealth, low or no education, physical isolation from urban centers, and limited social networks. It can also reflect political marginalization or discrimination against specific groups or communities. These factors, together with cultural beliefs and practices such as early marriage, result in distinctly higher risks of negative diversification for women and girls. In general, irrespective of gender, negative diversification is also associated with livelihoods activities pursued by necessity and not choice, and poverty traps.

Other types of diversification are more difficult to categorize, being not necessarily positive or negative. These types also often arise from limited choice. An example is paid unskilled work, which is usually the only type of work available to pastoralists, due to the low levels of education.[35] Typically, unskilled work is associated with proximity to urban centers, low wages, long hours, high competition for jobs, and marked seasonal variations in availability. Plus, employment and labor laws are weak or not applied. This encourages an exploitative labor market, where the supply of workers far outweighs demands.[36] Wage rates may be so low that opportunities for saving or acquiring productive assets are minimal, and further education or skills training is unaffordable. Similarly, low wages mean that remittances back to rural family members are also low.

At national policy levels, it has often been assumed that pastoralists should be transformed into agriculturalists, with explicit policy support to farming. However, this approach often overlooks the fundamental climatic risks in arid and semi-arid areas, and high rainfall variability. More reliance on agriculture over livestock can place pastoralists at greater risk of food insecurity and poverty traps. In areas where rainfall patterns, or access to irrigation, make crop production a viable option, better-off pastoralists are more likely to acquire the best plots. Table 4 summarizes some of the main types of diversification and alternative livelihood options.

33 Loftsdottir, 2004.

34 Little, 2016.

35 Little, 2016.

36 For example, see Iyer and Mosebo, 2017.

Table 4. Diversifying and alternative livelihoods in pastoralist areas

Option	Pros and cons, issues and choices
Livestock-related diversification and adding value	
Added-value activities related to livestock rearing and marketing, e.g., milk processing and sales (Mahmoud, 2016)	• Supports pastoralism • Requires access to markets • Can provide specific and relatively low-risk opportunities for women—but demands and opportunities are not infinite
Fodder production (Mahmoud, 2016; Fitzpatrick and Young, 2016)	• Supports pastoralism • Requires access to land, water, and markets; can involve private land enclosures and exclusion of other pastoralists from key grazing areas
Agropastoralism (Bushby and Stites, 2016; Fitzpatrick and Young, 2016)	• Relevance and level of risk closely linked to rainfall—wide range of contexts • Requires access to land and enough livestock • Risks of agricultural land competing with rangeland • Flexibility—can enable seasonal or annual shifts in emphasis on livestock vs. crop production due to rainfall, security, market demand, or other factors
Non livestock-related diversification and alternative livelihoods	
Investments in new businesses, especially urban-based businesses (Mahmoud, 2016)	• As financial services are limited, a choice available mainly to wealthier households, and/or peri-urban and urban households • Strong social networks often important to access finance
Education (Jackson, 2011; Mahmoud, 2016; Iyer and Mosebo, 2017)	• A critical and positive livelihood option, but more available to wealthier households, and to boys and men; more accessible to peri-urban and urban households • Social ties to urban centers are important, e.g., to provide accommodation and food to children from rural areas
"Medium" wage income, e.g., teachers and nurses in government; NGO employment; mechanics (Jackson, 2011; Mahmoud, 2016; Iyer and Mosebo, 2017)	• Often requires education, especially higher education, and so less accessible to women and girls; arises mainly by choice • Can provide relatively high levels of remittances back to rural households • Often draws on social networks to access employment • Involves types of employment with relatively fair wages, benefits, and protection, and relatively high predictability • Can involve out-migration, especially for higher-paid, professional-level employment
"Low" wage labor, e.g., agricultural labor, truck loaders, construction, domestic cleaners, and cooks; bar and hotel work (Stites et al., 2014; Iyer and Mosebo, 2017)	• Urban workers often retain ties to rural home areas • Often relates to exploitative, unpredictable, or seasonal labor, or labor involving high health or protection risks; can involve out-migration • Reflects limited education, and migration and labor through necessity • Can involve in-kind payments, e.g., in food or alcohol, or accommodation, and in turn, very low or no cash income • Often one of the few options available to women and girls • High risks of poverty trap

Income from collection and sale of natural resources, e.g., charcoal, firewood, gums, resins, stone, mining (Young et al., 2016; Stites et al., 2014; Little, 2016)	• Reflects limited education and limited choice, but less associated with out-migration; exceptions include gold mining, which attracts migrants from across a wide region, even cross-border from Chad to Sudan • Depending on the specific item collected, often one of the few options available to women and girls • High risk of poverty trap
Agriculture (Burns et al., 2013; Fitzpatrick et al., 2016; Bushby and Stites, 2016)	• Wide range of pros and cons related to local contexts • High risk in areas with high rainfall variability • Often reflects limited choice in contexts of declining livestock ownership; high risk of poverty traps in these cases • Risks of agricultural land competing with rangeland
Trading, e.g., market trade in food or clothes; brewing and beer sales; khat trade (Abebe, 2016; Stites et al., 2014)	• Relatively predictable and can be managed independently/privately • Mainly peri-urban or urban • Reflects low education • Often one of the few options available to women and girls

Policy and programming issues: A summary

The information of pastoralism presented in the primer points to at least five key elements of policy and programming:

Support pastoralist livestock systems – these systems are the backbone of the economy in pastoralist areas and supply livestock to local, regional, and international markets. These systems are well-suited to changing environments and climates, but mobility of livestock herds is critical. The systems are also the basis for positive livelihoods diversification, i.e., diversification around the core business of livestock production.

Recognize wealth differentiation – the logical economic strategy of poorer pastoralists is to build their herds rather than selling animals for cash income. For these households, minimizing herd loss is more important than creating new markets. This means supporting herd growth through reducing losses due to drought and livestock diseases and ensuring access to rangeland and water.

Support positive livelihoods diversification – as indicated, this often means working with pastoralists to identify and support activities related to livestock production and marketing (see Table 4). It also means supporting education. Pastoralist areas often have the worst education indicators relative to national education levels. Education provides a pathway to better paid employment and meaningful remittances.

Recognize gendered pathways – options for productive pastoralism, livestock-based positive diversification, and education are highly gendered in pastoralist areas. Specific attention is needed to address marked gender discrimination and provide women and girls with meaningful livelihood opportunities.

Support rights, representation, and voice – pastoralists are often politically marginalized and have limited influence over policy; they may also be unaware of their rights. Large-scale pastoral development programs are often designed with minimal or no involvement of pastoralists, despite their considerable knowledge on their environment and livelihood systems.

The AU *Policy Framework for Pastoralism in Africa* has two main objectives. Objective 1 is rights-based and broadly aligns with the USAID Pro-IP Policy; Objective 2 has an economic basis and focuses on pastoralist systems of livestock rearing:

> *Objective 1. Secure and protect the lives, livelihoods, and rights of pastoral peoples and ensure continent-wide commitment to political, social, and economic development of pastoral communities and pastoral areas.*
>
> *Objective 2. Reinforce the contribution of pastoral livestock to national, regional, and continent-wide economies.*[37]

A question for USAID is if and how it should fully harmonize its programming in pastoralist areas with the AU policy, while also supporting livelihoods diversification that fits with the aspirations and preferences of pastoralist communities

37 African Union, 2010.

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Training on pastoralism in Africa

Massive Open Online Course (MOOC) on "Pastoralism in Development": An Online Learning Journey: https://www.iied.org/pastoralism-development-learning-journey-free-massive-open-online-course-mooc.

Pastoralism and Policy Training: Addressing Misconceptions and Informing Dialogue: https://www.iied.org/pastoralism-policy-training-addressing-misconceptions-informing-dialogue.

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