

# Livestock, Climate and the Politics of Resources:



*a primer*

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## What is pastoralism and why does it matter?

This primer focuses on one type of livestock-keeping: pastoralism. Pastoralism is a way of raising livestock that makes use of variable landscapes by moving animals and managing their grazing.<sup>1</sup> It provides livelihoods for many millions of people and makes use of rangelands on every continent but Antarctica, across more than half the world's land surface.

What are its defining features? First and most importantly: **pastoralism makes use of variability**. The rangeland environments where pastoralism thrives are extremely diverse, with rainfall and snowfall varying enormously between the seasons and from year to year. In many places, climate change is making weather even more erratic. Pastoralism uses traditional knowledge and practices to help animals and people live together in uncertain and unpredictable environments.

Secondly, **pastoral animals' grazing is managed through deliberate herding, enabled by close, caring interactions between humans and animals**. For a healthy diet, grazing animals need to eat a balance of different plants. Herders help animals do this by letting them forage across environments that vary in altitude, moisture and type of vegetation. This usually requires moving animals, often seasonally. Herders' skills and knowledge, plus animals' training, lets animals make the best use of nutrients from mixed landscapes that vary dramatically over time.

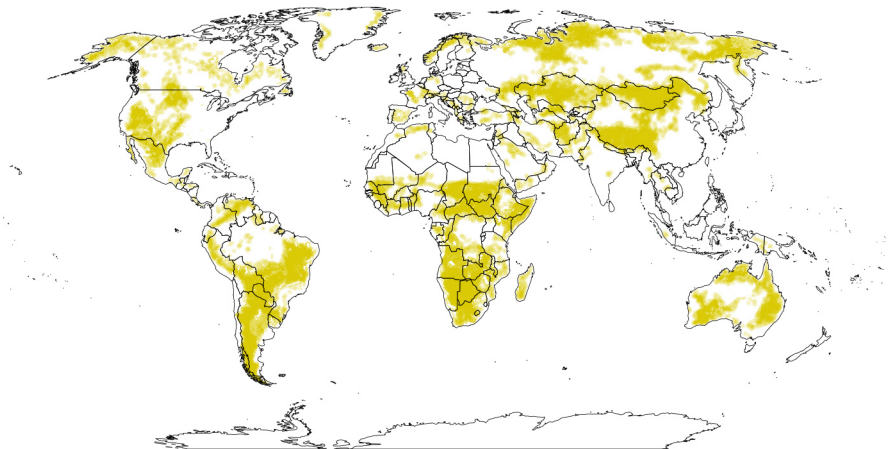
Thirdly, pastoralism plays a critical role in protecting environments, sequestering carbon and enhancing biodiversity, while providing highly nutritious food for often marginalised people. Pastoralists make use of marginal lands that are often sparsely settled, so they often have a distinct cultural identity even if they interact closely with settled farmers and urban dwellers.

Pastoral systems are incredibly diverse. Some pastoralists are fully nomadic and permanently on the move. Others are semi- or permanently settled. Some move long distances between regions. Others move animals daily or seasonally in a smaller area. Some have very close relationships with farmers, either farming themselves (agro-pastoralists) or exchanging manure or animal products for access to land where animals can feed.



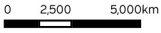
A sense of this variety is offered in Box 1, which gives summaries of pastoral systems in different parts of the world (see Figure 1).

Figure 1

## The global distribution of pastoralism



### Legend

	Pastoralist regions		National Boundaries		Robinson projection
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Source: IUCN/UNEP (2015)

# What does pastoralism look like around the world?<sup>2</sup>

## Eastern Africa

Pastoralism in eastern African and the Greater Horn has long been characterised by relatively equal access to communally-managed rangeland and reciprocal friendship exchanges, gifts and marriage alliances that help to spread risk within communities. However, development projects encouraging settlement, as well as **land and green grabbing**, are threatening pastoralist livelihoods and cultures. These interventions are often justified by portraying pastoralists' traditional practices as destructive or inefficient uses of land.

## West Africa

In West Africa, trade and livestock herding (transhumance) routes have historically spanned huge distances, criss-crossing the Sahara and linking the Sahel with the coast. Pastoralists have close relationships with farmers, exchanging manure or temporarily entrusting livestock to them. However, the pastoral economy is changing rapidly and inequality is growing. Environmental degradation and the expansion of the desert has been blamed on pastoralism and new initiatives like the "Great Green Wall" are often carried out at their expense (see section 4). There is increasing concern about violent conflict in the region, including between marginalised herders and settled farmers.

## Middle East and North Africa

There have often been romantic, distorted views of pastoralists in this region. Efforts to 'detrribalise' and settle nomads were central to colonial pacification and 'modernisation' policies. Often, this led to conflict, as in Sudan or Palestine. Many colonial policies persist and pastoralists are often marginalised by states — even as pastoral systems have changed dramatically. Trucks have replaced the movement of animals to feed and water, while dependence on wage labour and export markets has increased. War, frequently focused on oil-rich formerly pastoral areas, along with on-going inter-ethnic conflicts, has forced many pastoralists to take up new livelihoods, sometimes as refugees.

## South Asia

South Asian pastoralism varies from camel-keeping in the deserts of Rajasthan and Gujarat to upland pastoralism in Himachal Pradesh, Assam and the Karakoram mountains. Pastoralism is being squeezed in terms of territory, political status and economic opportunity. Urbanisation, 'green revolution' agriculture and other forms of 'development' are further marginalising pastoralists. They have adapted, including by grazing along roadsides, in peri-urban and urban areas and on crop farms.

## Southeast Asia

While 'pastoralism' is often not seen as a distinct livelihood category here, many people make use of livestock, usually integrated with farming. In upland areas and the dryland plains of Myanmar, for example, livestock-keeping is a crucial to livelihood, with mobility between areas vital for survival. Even so, such livestock-keepers are often not recognised by policymakers, who focus on larger-scale poultry and pig production.

## China and Central Asia

Great pastoral societies, often seen as the 'barbarians' by settled agrarian communities, dominated the steppes of Central Asia for centuries. However, integration of pastoralism into imperial states, the Soviet Union and communist China, was fraught. Centralised collective livestock farms failed dramatically. The process of collectivisation then de-collectivisation led to a mix of ways of managing land. Today, invasion, war and major infrastructure projects like the Karakoram highway or the Chinese Belt and Road Initiative have further transformed peoples' livelihoods in high mountain regions. This turbulent history has meant that pastoral systems have transformed, yet still persist in many areas.

## The Arctic

Keeping reindeer and small stock is significant in Norway, Sweden, Finland and parts of Russia, while horse-cattle systems remain in the Taiga forests of Siberia. Reindeer pastoralism focuses on meat production from fast-reproducing animals, which are semi-wild and communally-held, but individually-owned. A partial transition to ranching is occurring in some places, but pastoralism — without fences and with herding — persists. Ecological debates about ‘overstocking’ and the need to manage populations within ‘carrying capacities’ have provoked controversy. Conflicts between pastoralists and conservation, tourism and extractive industries have intensified, with pastoralism often seen by the state as ‘backward’ and needing ‘modernisation’.

## Europe

From the Scottish Highlands to the Pyrenees, through the Alps to the Balkans and Greece, as well as the islands of Sardinia and Corsica, European pastoral regions have seen massive de-population over several decades. Despite the European Union’s Common Agricultural Policy’s recognition of the value of traditional pastoralism for marginal land, such practices have declined or been transformed. Herding labour is increasingly carried out by migrant workers (largely from the Balkan states and North Africa). While agro-tourism has revitalised small-scale artisanal production in some regions, flocks and herds are now concentrated in the hands of far fewer owners. Much livestock production has shifted away from the hills and mountains to the plains as part of intensified, mixed farming systems. Conservation, tourism and wildlife uses (such as reintroduction of bears and wolves) have caused additional conflicts and tensions.



## The Americas and Australia

Ranching emerged in the Americas and Australia through processes of colonisation. The process of taming, controlling and confining ‘modern cattle’ in fixed Texas-style ranches made the processes of colonisation and dispossession and the development of an industrialised meat supply chain, possible. This transition to market-based, commercial and individualised production system was made possible through force and violence, often resulting in the extermination of partially pastoral indigenous peoples. It was also supported by technologies including new forage varieties and barbed wire. Pastoralism survived in some isolated areas, including high-mountain llama and alpaca production. Today some ranchers in Australia and North American are returning to grazing practices reminiscent of traditional pastoralism.

## Southern Africa

The former settler states of Southern Africa show a similar history of colonisation. The extensive pastoral systems of the Ndebele, Tswana and Himba were constrained by colonisation and racial-segregation. Through a process of massive dispossession, African peoples across South Africa, Botswana, Namibia and Zimbabwe were allocated to reserves, communal areas or homelands, while large ‘European’ farming and ranching areas were established — often on the most favourable land. Transhumance (seasonal migration with livestock) and mobility persisted, however, as part of ranching systems and in dry-land mixed farming systems. While the vast herds of earlier times no longer exist, livestock, notably cattle, are still central to these agro-pastoral systems, retaining major social and cultural significance.

## Why does pastoralism matter in the 21<sup>st</sup> century — and beyond?

What are the characteristics of contemporary pastoralism that make it important today and in the future? Eight overlapping themes are identified here, to be explored more deeply in the following sections.

**Huge areas, large numbers of people.** Over half the world's land is rangeland, where non-pastoral livelihoods and food production are often impossible. Millions of people in hugely diverse groups around the world engage in pastoralism, as shown by a recent crowd-sourced mapping project.<sup>3</sup> This much land and this many people cannot be ignored, as they too often are in policy debates.

**Valuing variability.** Across regions, pastoralists live from variability, making a living in environments where agricultural and other livelihoods are difficult or impossible. As climate change and other forms of uncertainty intensify, pastoralists have unique knowledge and skills to respond flexibly and effectively in such turbulent conditions. This offers lessons for us all (see section 11).

**Mobility.** Mobility is central to pastoral practices and a key part of their response to variability. Some pastoral groups are almost permanently on the move, while others only move short distances. Mobility varies by animal species, season and environment. It also leads to complex forms of land use (see section 3). Understanding how mobility is central to adapting to uncertainty offers important lessons for our mobile, networked world (see section 11).

**High quality nutrition.** Pastoralists produce high-quality, nutritious animal products, which supply high-density protein and micronutrients to diverse populations through local sales and wider trade networks. These animal-source products can be a critically important contribution to the diets of poor, marginalised or under-nourished people, and are especially important for young children and pregnant women (see section 7).

**Enhancing biodiversity, protecting the environment.** Pastoralism has co-evolved with rangelands, parklands, savannas, and open woodlands that are essential habitats and important sites of biodiversity. Livestock grazing and browsing, and

migrations across these landscapes, can enhance biodiversity. The environmental benefits of pastoralists living sustainably with animals on these landscapes can far exceed the benefits of 'protecting' these ecosystems through exclusionary conservation (see section 9).

**Low carbon livestock production.** In contrast to intensive systems, extensive and mobile livestock production can be climate neutral or even climate positive. Because pastoral systems mimic and replace wildlife systems they may not add to total greenhouse gas emissions. While all ruminant livestock produce methane, pastoral systems can also help to build up soil carbon, reducing the total impact. Careful herding, adapted breeds, and manure management can further reduce emissions (see section 5).

**High value pastoralism.** Pastoralism offers a diverse range of values that policy-makers must better understand (see section 6). These include the social, cultural and environmental values of pastoralism not measured in markets. Support for local, territorial markets can provide new opportunities for sustainable livelihoods, bringing new people, ideas and cultures to marginal areas (see section 6).

**Supporting livelihoods and territories.** Thriving, sustainable pastoralism can keep rural landscapes alive economically, socially and culturally. In many areas depopulation and out-migration has undermined pastoral systems, and along with them the environments on which they depend. This reduces biodiversity, increases wildfires, and opens areas to less beneficial commercial investments. Flourishing pastoral communities feed a living countryside.

These themes confirm the importance of pastoralism, yet there is still much misunderstanding of pastoral systems, resulting in widespread biases and inappropriate interventions. For some, pastoralism is a 'backward' system, a stage on the way to something more settled and 'civilised'. This drives projects to 'modernise', to contain and tame so-called unruly and difficult outsiders. However this primer argues pastoralism should be understood as a highly productive, modern system, and an extraordinarily well-tuned 'infrastructure' for making the most of variable settings.

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## VIDEO AND ONLINE COURSE

- <https://www.celep.info/pastoralism-is-the-future-animated-video>
- <https://pastres.org/online-course/>

# Are pastoralists different from peasants?

Many people see peasants and pastoralists as different from one another. Peasant farmers are typically seen as settled, within the control of the state and as subjects of civilisation, modernisation and development. In contrast, pastoralists are often cast as unruly and backward. These are constructions, rooted in mythologies, ideologies and biases. In fact, the similarities between the two outweigh the differences, especially today.

The term ‘peasant’ has a long history and has been used in different ways. Often, it refers to any small-scale farmer who produces food for their own household and — perhaps — their local community. In recent decades being a ‘peasant’ has also been taken up as a political identity by, among others, the global movement, **La Via Campesina**. Peasant movements use the term in a deliberately political way to refer to people who live in a special relationship with their land, ecosystems and territories; who try to maximise autonomy, resilience and **food sovereignty**<sup>4</sup>; and who strive to produce healthy food for themselves and their communities.

Peasants, understood in this way, are struggling to protect their autonomy and independence from global capitalist markets that see food as just another commodity to be bought and sold for profit. Like pastoralists, they rely on intimate and traditional knowledge of landscapes and other living beings to sustainably produce high-value food (and other products and services). And indeed many livestock-keepers also farm, and are therefore known as agro-pastoralists (see Box 1).

Today, peasants and pastoralists face many of the same challenges. Land and resource grabbing (see section 8) are rife in rural areas that are seen as frontiers for investment and accumulation. Conflicts centre on enclosure and extractive projects — whether large-scale farms, energy plants, mining, or exclusionary conservation. Pastoralists’ traditional territories are now new frontiers for ‘development’ interventions and corporate investment, so they are confronting forces which peasants have been resisting for centuries.

At the same time, certain characteristics — linked to living with and from variability and responding to uncertainty — make pastoralists different from settled farmers. These differences are important in thinking about ways to support pastoralists and about building alliances between peasant movements and pastoralists.

## BOX 2

### Persisting pastoral principles

The PASTRES programme's research<sup>5</sup> shows how the basic principles of pastoralism persist, despite massive changes to pastoral areas.

- Pastoralists are good at **adapting to change through flexible practices** — mobility, but also dynamic restructuring of social arrangements, labour, land, markets and other resources. *We see this in Kachchh in Gujarat, India, where Rabari pastoralists must move through farmlands, industrial zones and urban areas, with flexible movement patterns guided by changing conditions.*
- Movement allows for the **flexible use of increasingly fragmented, mosaic landscapes in innovative ways**. *In Amdo Tibet in China, investments in infrastructure and national parks have disrupted traditional herding practices, but pastoralists draw on a diversity of institutions — the village, the monastery, local government — to maintain flexibility.*
- This in turn relies on forms of social organisation that can respond quickly — so **intersecting kin, clan and wider networks are crucial**. *Amongst the Boran of southern Ethiopia grazing and water resources are managed across these diverse social networks, in the same way as deep wells were historically.*
- All of this **can be helped by technology** — mobile phones and the Internet can assist with mobility, help respond to disasters, and facilitate sales to diverse consumers. But technologies are always **rooted in social relations**. *When locusts struck Isiolo in Kenya in 2020, people identified swarms and mobilised young people with motorbikes to scare them away from valuable grazing. They organised these efforts using mobile phones.*

What is unique about pastoral production? Livestock are ‘liquid’ capital that reproduce, move and live — much more so than crops grown in fields.<sup>6</sup> Human-animal connections may also be even more important to pastoralists than other kinds of farmers. Livestock can be accumulated in different ways — deaths are counteracted by regular births. The dynamic ecology of livestock, with multiple breeds, are very different from crop systems. Mobile peoples, living from ‘marginal’ lands, distant from core infrastructure and far from centres of power, have particular relationships with the state and elites. Living near or across borders, their associations with the nation may be ambivalent, and social and market networks may stretch across countries.

Drawing on pastoralists’ skills in responding to uncertainty can also enhance peasant-based livelihood strategies (see section 10). There are opportunities to find common cause amongst all those left behind by ‘development’ or made precarious by our increasingly turbulent world — certainly peasants and pastoralists, but many others too.

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# What is the difference between pastoralism and other ways of raising animals?

Livestock keeping practices exist on a spectrum. At one extreme is intensive livestock production in factory units where animals are contained, continuously monitored, fed imported feeds and supplements, and rarely see the light of day. At the other end of the spectrum is pastoralism, which makes use of variable resources in ways that would not be possible without human management, especially through careful herding and mobility (see section 1).

Systems at either end of the spectrum differ dramatically in terms of environmental impacts and animal welfare. They also rely on different assumptions about landscapes, property and access to land, with exclusive private rights to land generally less common in pastoral societies.<sup>7</sup>

The 'pastoral' end of the spectrum is diverse, with a wide array of practices. A classic nomadic herder moving across the deserts or steppes fits here, as does a transhumant herder moving animals from summer to winter pastures in the mountains of Europe or Tibet, or from the drylands to the coast in West Africa. But so too does a Southern African or South-East Asian agro-pastoralist keeping animals at a fixed home and grazing them at different sites seasonally. Even an extensive, grass-fed livestock farmer in the Americas, Australia, or Europe employs pastoral practices when fences are taken down and the landscape is used flexibly. No single practice is definitive. Box 3 highlights the key features of pastoral production.



## Production in a variable, extensive system

- **Herding and training animals.** Making use of a variable environment requires skilled herding and well-trained animals. Animals must seek out the highest quality forage in a marginal landscape. Gaining access to new growth and balancing food intake with water is crucial. Skillful herders can boost production through careful management. This requires an intimate connection between humans and animals. Trained animals also help others, and pass down knowledge inter-generationally. The relationships within a herd or flock can be key. Rooted in human-animal entanglements, herding skills are centred on deep caring relationships and traditional knowledge.<sup>8</sup>
- **Management of key resources.** In complex grazing landscapes, specific patches are often essential for keeping animals alive at certain times of year — as is the case at the end of the dry season or during heavy snowfalls. These ‘key resource’ areas are crucial. Remove or degrade them, and production collapses. Pastoralists work hard to protect or enhance such key resources. This may occur through collective management — like well management institutions or the traditional protection of oases, *wadis*, or *fadama* (‘wetlands in drylands’) — or through the individualisation of such sites, such as *kalo* grazing reserves in Borana, Ethiopia.<sup>9</sup>
- **Animal breeding.** Pastoral animals make use of highly variable environments, so breeding strategies must respond to this. Unlike in conventional animal science, the aim is not to create an ‘optimal’ breed, uniform across all animals. Pastoralists breed with an eye for the performance of the whole herd or flock, seeking diversity across individual animals. Variety is a strength, while uniformity is a risk. Pastoral breeding is a permanent process of adaptation.<sup>10</sup>

It is important not to fixate on an idealised, romantic view of pastoralism and the ‘noble nomad’. Such ideal types no longer exist — if they ever did. You can be a pastoralist if you live in town or a refugee camp. Yet the core characteristics of pastoralism identified above describe a system with a radically different logic and impact than intensive livestock farming.

Pastoral systems are not static; they are continually evolving and adapting. In Sardinia in Italy, for example, traditional pastoralism was historically associated with seasonal movement from the mountains to the plains: herders had a permanent home in the mountains, but grazed animals on the plains in winter when high pastures were snow-covered. Such practices persist, but animals are increasingly moved long distances by truck and many herders have chosen to settle in the plains or the hills, taking advantage of better access to infrastructure. Subsidies and policies have encouraged this transition, but most pastoralists have hung on to at least some pastoral practices in order to continue benefiting from variability, rather than being fully exposed to uncertain environments and volatile markets. Today’s pastoralists are always adapting (Box 4).



Photo 1 - Credit: Nipun Prabhakar

## Adaptable pastoralism: three cases<sup>11</sup>

In Amdo Tibet in China, there has been a sustained attempt to settle people in villages and towns. These feature schools, services and state-provided accommodation. This is attractive for some, especially families with young children seeking education. In order to maintain a pastoral livelihood, families split up. Children and grandparents or women move to town. With less labour in the rangelands the systems of management must change too, and traditional movements between summer and winter pastures may be more limited. Households often combine herds or flocks. Increasingly, trucks and motorbikes are used to move water and fodder, rather than moving animals.

In northern Kenya, many pastoralists have lost animals due to droughts and conflicts. Some have lost nearly everything and must seek other livelihoods, including taking paid work as herders or traders. People displaced by conflict must often leave behind their animals when they move to refugee camps or towns. Drawing on relatives, friends or humanitarian aid, some are able to accumulate a little and start again, building up from a few animals to re-establish a pastoral way of life.

In southern Tunisia, many pastoralists explain that they must 'leave in order to stay'. They must join the migration flow to Tunis, or the Gulf or Europe to earn money that can then be reinvested in pastoral production at home. Remittances may provide the only viable way to stay in a dry and remote area. The ties between migrants and home is strong, and the migrants will hire workers and invest in collective institutions to manage their animals, organised at a clan or village level. The pull of home and the associations with pastoralism are strong. Even if people only come back for short periods, their connections and identity remain as pastoralists on the desert's edge.

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Photo 2 - The daughter of a livestock owner in Douiret, Tunisia directs the male dromedary first, followed by the female and lactating dromedaries, towards feed composites she has prepared with the help of her brothers. Credit: Linda Pappagallo

# Do pastoralists destroy the environment and cause desertification?

Pastoralists are frequently blamed for environmental destruction. This is often based on a poor understanding of dryland ecologies and landscapes, and persistent biases against pastoral people. These long-standing dynamics have shaped environmental policies from the colonial era to the present.

Debates about ‘desertification’ in the Sahelian region of West Africa are a prime example. Colonial science misunderstood dryland environments and assumed that the desert was advancing, threatening productive farmlands. Blame was pinned on pastoralists inhabiting the drylands, with calls to reduce population pressure and settle pastoral populations.<sup>12</sup> Only later, with time-elapsing satellite photography, it became clear that drylands expanded and retreated cyclically while environmental degradation around settlements and waterpoints were caused more by ‘development’ interventions than pastoralists’ traditional practices.

Nonetheless, colonial ideas of dryland landscapes persist today. The present obsession with the ‘restoration’ of dryland areas through tree planting has deep roots. In parts of West Africa, for example, colonial requirements for sufficient woodland were imposed based on visions of European forests rather than open dryland landscapes.<sup>13</sup> The idea of the **taux de boisement normal** — the percentage of forest cover required by a ‘civilised’ nation — took hold in French colonies from the 1800s. Since then tree planting has become part of the ‘civilising mission’ of development.<sup>14</sup> Equally, the negative description of rangelands as ‘wastelands’ in India has framed attempts at environmental rehabilitation from the colonial era until today.

However, these savannas are not degraded forests. Instead, they are ‘open ecosystems’<sup>15</sup>, where trees are scattered in much greater numbers than often believed.<sup>16</sup> Restoration of dryland landscapes should therefore not envisage ‘regreening’ through tree planting. It should work with existing ecosystems, without imposing a false vision of the ‘original’ landscape. High-profile land restoration

initiatives often assume 'empty' land needs reforestation, justifying huge interventions (see Box 5). Globally, around one billion hectares of rangelands have been mistakenly earmarked for such restoration thanks to faulty assessment techniques.<sup>17</sup>

## BOX 5

### The Sahelian Great Green Wall<sup>18</sup>

At the 2021 One Planet Summit, French President Emmanuel Macron announced US\$14 billion in funding for the Sahelian "Great Green Wall". Across 8,000 kilometres and 100 million hectares, from Senegal to Djibouti, tree-planting and greening of landscapes was to 'roll back' the 'advancing deserts' of the Sahara. Visible from space and pronounced a 'wonder of nature', the symbolism of a wall reversing environmental degradation, quelling insurgency and conflict and stemming the flow of migrants is dramatic.

Originally launched in 2007, the Sahelian Great Green Wall has a poor track-record. While the websites may list glowing achievements, many questions remain unanswered. Plenty of trees have been planted, but how many have survived, and what are the gains for the farmers and pastoralists inhabiting the drylands of the Sahel? Is such a grandiose, continental strategy the right approach?

While the initiative has shifted away from mass tree planting, the environmental restoration narrative remains central, with pastoralists almost nowhere to be seen in planning or implementation.<sup>19</sup>

Considerable funds are being made available for biodiversity protection and climate mitigation through forestry and land use. For example, the “30x30” initiative driven by France, Costa Rica and the UK<sup>20</sup> proposes that 30 per cent of the world’s surface should be “protected for nature” by 2030 — including through the expansion of protected areas and the exclusion of people (and livestock). The massive financing efforts emerging from global climate negotiations also rely on forest-based offsetting schemes, mainly through voluntary carbon markets.<sup>21</sup>

There is a very real danger that such efforts, guided by a basic misunderstanding of dryland and mountainous landscapes, will target rangelands where pastoralists make a living, driving dispossession and marginalisation in the name of climate action. This form of ‘green grabbing’ is highly dangerous, undermining livelihoods and ecosystems (see section 8).

## The science of variability: non-equilibrium ecology

Where do these misunderstandings arise from? How can science get it so wrong? Understanding this requires exploring the history of ecological science and its links to policy.

‘Rangeland management’ emerged in the United States in the early 20th century, based on a particular understanding of ecology. It drew on the work of Frederick Clements, who believed that ecosystems naturally moved through different stages, one after another (‘successional ecology’) with the final or stable state generally a closed, old-growth forest. Rangeland management accepted this theory, and an associated belief that livestock numbers needed to be closely controlled to prevent forests from turning into grassland. Textbooks were written, university courses established, and generations of range managers were trained to follow these rules. The philosophy was exported around the world, through colonisation and ‘development’ projects, so that practices in Africa and Asia replicated management plans developed for the midwest United States.

Unfortunately, ecosystems and climates in other places differ dramatically from the areas on which these theories were based. In temperate areas there is some truth to the idea of an ‘equilibrium’ and a relatively stable ‘carrying capacity’. The climate is similar from season to season and can support about the same number of animals every year. However, in so called ‘non-equilibrium’ environments, including dryland and mountain ecosystems, external factors like variable rainfall are much more important. Most such landscapes never support their notional ‘carrying capacity’ and animal populations fluctuate from year to year.<sup>22</sup>

In the 1980s and 1990s a new perspective emerged, sometimes called ‘non-equilibrium rangeland ecology’ or ‘new rangeland ecology,’ based on better understandings of these landscapes and ecosystems.<sup>23</sup> It was a paradigm shift away from the old ideas of carrying capacity, fixed stocking rates, and the linkages between livestock and landscape degradation or desertification. This perspective offers a very different approach to environmental management in pastoral areas and represents a fundamental challenge to the simplistic colonial gaze of stability and control. It explains the importance of pastoralists’ traditional practices, based on flexibility, adaptability, mobility — and living with and from variability (see section 1). It also suggests a very different perspective on ‘resilience’, as transforming flexibly in the face of change, rather than bouncing back to a stable state.<sup>24</sup> This has profound implications for ‘development’ projects.

## Science and the politics of policy<sup>25</sup>

Unfortunately, the ‘new ecology’ has often been ignored, and equilibrium perspectives persist. Why is this? The relationship between science and policy is not linear: new scientific paradigms do not automatically result in changes to policy and practice.

Dominant narratives persist as standard ways of doing things get stuck, institutionalised in professional practices, and reinforced by big events like World Desertification Day and frameworks like the United Nations Convention to Combat Desertification.<sup>26</sup> Shifting ideas and practices translate into shifting power, which is frequently resisted by established players.



The old 'equilibrium' perspective — still promoted by governments, aid agencies and international organisations — promotes a control-oriented, technocratic response. Livestock reductions, 'green belts', forest planting and engineering solutions dominate. The new non-equilibrium paradigm, by contrast, embraces uncertainty, and makes productive use of variability. It suggests a very different kind of 'range management', more attuned to pastoralists' practices.

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# Are livestock contributing to climate change?

The short answer to this question is, yes. Ruminant livestock in particular (cattle, sheep, goats, etc) produce significant quantities of methane through digestion. But we have to ask: which livestock, where? Livestock are often portrayed as the villain of climate change, with cows portrayed as equivalent to cars and beef to coal. But this is a gross over-simplification that leads away from climate solutions that protect the rights and livelihoods of pastoralists and the communities who depend on them.

## The problems with simplistic anti-livestock narratives

Globally, simplistic arguments that call for an end to — or dramatic reduction in — all forms of livestock production are increasingly common. Media briefings, campaign positions and policy documents repeat this position, often with little nuance. Businesses, conservation and environmental organisations, along with some governments and activists, are aligning behind a narrow model of technological climate solutions combined with ‘rewilding’ and conservation. This grouping is beginning to rival the huge lobbying power of the meat and feed industry, which has shaped our food system and influenced policies for decades. In the meantime, the voices of small-scale fishers, peasants and pastoralists go largely unheard.

A simplistic, generalised narrative about livestock and animal products is misleading and dangerous. It fails to differentiate between livestock systems with major impacts and those with relatively few. It does not address questions of climate justice. It doesn't ask about who lives on, from, and with the territories designated for carbon-focused ‘restoration’ projects. And it doesn't take into account the fact that animal products are vital for nutrition in poor communities around the world — places where crop production is not possible in particular.

In many parts of the world a reduction in animal-source foods is indeed essential for improving diets and health. Reducing industrial livestock farming should be a top priority: for climate, environmental and animal welfare reasons. But, as explained in previous sections, intensive, contained, factory farm production is very different from extensive or pastoral systems. Lumping them all together in a single anti-livestock narrative either lets industrial producers hide behind more benign systems of production, or forces marginalised pastoralists to bear the costs of a transition to a lower-carbon future, despite having contributed virtually nothing to climate change.

Generating just climate solutions requires a better understanding of the diversity of livestock production, and more careful and nuanced calls for change.

## Gaps and assumptions

A recent report — *Are livestock always bad for the planet?* — identified a number of assumptions and gaps in the data on livestock and climate change.<sup>27</sup> Global assessments of livestock's impact — commonly performed using 'life-cycle assessments' and originally designed to assess closed industrial systems — are overwhelmingly based on data from intensive systems in rich countries. But where and how meat is produced can make a huge difference. Data from key pastoral regions are under-represented in many global studies, rendering these estimates misleading.

Some advocates for intensive animal agriculture argue that the manure management, improved feeds and enhanced genetics in intensive systems can reduce emissions, while free-ranging animals produce more methane because of the rough forage they consume. However, there are serious flaws in this argument (Box 6).



## BOX 6

# Contrasts between extensive and intensive systems

Studies in Kenya measuring methane produced by animals grazing on rangelands show much lower emissions than are assumed in standard models used for global assessments. Estimates from many international organisations therefore massively overestimate emissions from African animals grazing on natural rangelands (Figure 2).

Emissions experiments are usually carried out with animals bred for industrial production. They ignore the genetic diversity and adapted physiology and behaviour of pastoral animals, as well as the local knowledge, herding and training skills that are the core of pastoralism.

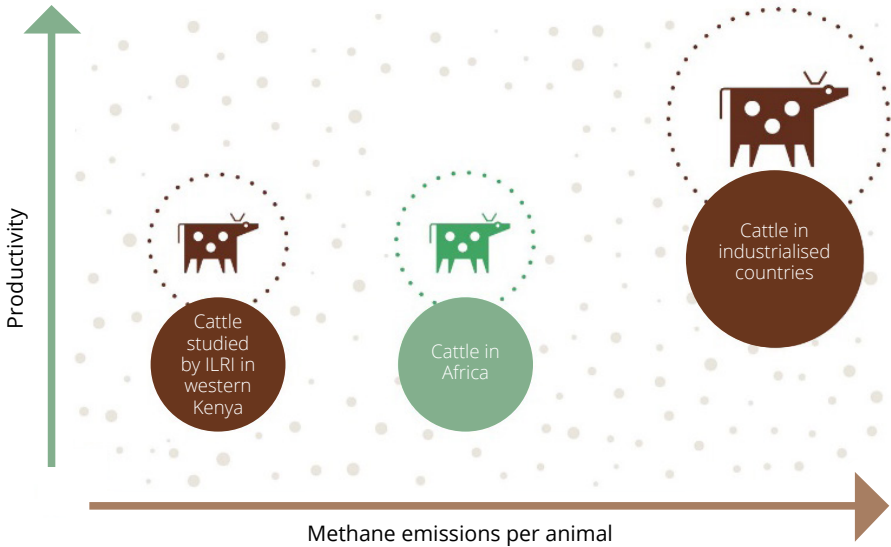
In mobile pastoral systems indigenous breeds are adapted to eat highly nutritious forage combined with rough grass, including vegetation with high tannin contents. These feeding practices are not available to contained animals but can reduce methane production significantly.

While pastoral grazing involves harvesting nutrients across a diverse grassland landscape, industrially-produced animals must rely on imported feeds like soy, which may displace production of food crops. Industrial livestock infrastructure and the transportation of inputs and products also have huge environmental costs.

Finally, in contrast to the concentrated waste produced in industrial systems, manure and urine from mobile, grazing herds and flocks are dispersed, potentially leading to incorporation into the soil and sequestration of carbon and nitrogen, rather than emissions.

Figure 2

## Comparing methane emissions from pastoral and industrial animals



### Legend

	Emissions calculated directly		Emissions estimated using Tier II approach
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Source: ILRI (2018)

All ruminant livestock produce methane as part of their digestion process. Methane is a greenhouse gas, described by the International Panel on Climate Change (IPCC), as a 'short-lived climate forcer'. It has a major impact on warming but disappears over about a decade. Carbon dioxide is very different, with less immediate effect, but persisting essentially forever. Although reducing methane may have a quicker impact, long term climate solutions require dealing with CO<sub>2</sub>, although reducing methane may have a quicker impact.

The standard way of assessing contributions to global warming uses CO<sub>2</sub>-equivalent measures. 'Conversion factors' are chosen to create a single metric, given the different so-called global warming potential of different gases. Scientific debates about these calculations are ongoing and impacts of gases like methane may have been over-estimated, diverting the focus from fossil fuel linked CO<sub>2</sub> emissions.<sup>28</sup> Simply put, cars and cows are not equivalent.<sup>29</sup>

There are other questions about how we assess emissions from pastoral livestock production. Arguably, not all methane emissions should be seen as additional; this depends on the baseline used. A new industrial livestock unit creates emissions where none existed before, so its climate impacts are clearly additional. But for

Figure 3

## Greenhouse gas emissions in wildlife, extensive and intensive systems



Source: Manzano and White (2019)

extensive systems pastoralism replaces (or combines with) wild herbivores. 'Natural' systems produce methane, just as pastoral systems do, but they have done so for millennia without threatening the stability of the climate (Figure 3).<sup>30</sup>

Finally, many assessments of the impacts of different forms of production rely on a narrow approach that assesses emissions per animal or per kilogramme of livestock product. This is hugely misleading, as it misses wider 'systems' level impacts (and benefits) and favours industrial systems over more extensive alternatives.

## A systems approach

A systems approach takes into account all the climate impacts of production including: emissions from slurry/manure; imported feed, including deforestation at source; embedded emissions from infrastructure (like concrete structures); and the global transport of inputs and products.

While pastoral systems have some negative climate impacts, as individual animals do produce methane, they are associated with lower impacts elsewhere. They generally minimise external inputs, shorten value chains and have lower transport and infrastructure costs. At the same time, they may even help to put carbon and nitrogen back into soils.

Extensive livestock are perhaps the only 'technology' that can reliably produce high-quality protein from poor and variable landscapes unsuitable for crop production. Abandoning extensive livestock production thus has high costs, especially where people experience protein deficits. Pastoralists also produce multiple other benefits — improving biodiversity, enhancing environments and improving livelihoods for many in marginalised settings. Focusing narrowly on emissions per animal creates distortions in assessments and policies. Instead, a more holistic, integrated systems level analysis is needed, as illustrated by new research (Box 7).

## BOX 7



# Systems approaches

### Case 1:

**Sardinia.** Studies show that greenhouse gas emissions per unit of milk are lower in extensive compared to intensive systems when carbon sequestration is taken into account. Taking a whole value chain approach, another study contrasted artisanal production and more industrial production (albeit through a sales cooperative processing Pecorino Romano cheese). Production dominated emissions (92 per cent) in both, but the industrial system showed higher processing emissions, while the artisanal system produced marginally more transport emissions.<sup>31</sup>

### Case 2:

**Amdo Tibet, China.** An assessment of greenhouse gas emissions in Guinan, Amdo Tibet compared an extensive system with an industrialised system dependent on feedlots and imported feed. The latter had 40 per cent higher total emissions per kilogramme. Methane production per animal was slightly lower in the industrialised system, but the extensive village system used fewer external inputs and sequestered more carbon.<sup>32</sup>

### Case 3:

**Senegal.** Studies in the Ferlo region of northern Senegal show that mobile pastoral systems can be in carbon balance at a landscape level, albeit with high levels of seasonal and spatial variation. Areas near water points, for example, have high levels of net emissions compared to open rangelands. Estimates show methane and nitrous oxide emissions from animal digestion were offset by carbon sequestration, as manure and urine were incorporated into the soil through trampling and by dung beetles.<sup>33</sup>



To tackle climate change we therefore need a wider, systems approach to assessment, and further research on what diverse livestock systems mean for emissions, rather than misleading ‘livestock are bad’ narratives.

Flexible, mobile pastoral livestock systems are also crucial for climate adaptation. For example, pastoral practices can adjust to changed rainfall patterns. Adaptation is a core pastoral principle that can help people to live in a heating world.

In the end, choices about how to tackle the climate crisis are about both justice and science. So where should emission reductions be prioritised? Methane is increasingly seen as a ‘gas of concern’. We could achieve major ‘quick wins’ here by dramatically reducing or banning oil and gas exploration and fracking, which emit huge quantities of methane.<sup>34</sup> In agricultural, reducing emissions from industrial livestock production needs to be prioritised.

It is a mistake to lump pastoralism and other extensive systems into new agreements about measurement, reporting and verification of greenhouse gas emissions. Global commitments on methane should focus instead on the big polluters: oil and gas production, landfills, coal mining and intensive ‘industrial’ livestock rearing. This all means that our discussions, policies and agreements need to include enough nuance to capture and respond to these very different ways of raising animals. Given the right opportunities, pastoralists can be at the forefront of tackling climate change.

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# What is the value of pastoralism?

Too often, pastoralists are seen as offering little value compared to other forms of production. This is incorrect. Pastoralists are dynamic contributors to vibrant markets, as well as providing food and generating multiple environmental, social and cultural benefits.

The value created by pastoralism is often widely distributed and informal, making it very difficult for either powerful companies or the state to 'capture' these benefits. Thus, while pastoralists can nourish communities and support local cultures, there is often a drive to replace them with more 'legible' forms of production that result in reliable tax revenues, and the creation of new (often international) markets for commodities.

The idea of 'total economic valuation' has been used to try to capture some contributions that may be invisible to policymakers. While attempts to assign monetary values to social, environmental, and cultural goods are notoriously problematic, this kind of recognition can be important because what is not measured or counted is often disregarded. Studies have tried different ways of assigning value to pastoral systems, with interesting results (Box 8).<sup>35</sup>



Photo 3 - Processing raw milk in an artisanal Pecorino production in Sardinia, Italy. Credit: Giulia Simula

## The value of pastoralism

- Official estimates of how much livestock is traded — and therefore the contribution pastoralists make to feeding communities — are often dramatic underestimates. This is because much trade is informal or illegal.
- Over 40 different ‘values’ of livestock systems have been identified, many ignored and/or difficult to measure. Along with producing goods like meat, milk, manure, wool, hides, and skins, livestock provide transport, draft power, environmental services, and cultural values, they also support livelihoods in veterinary services, trade, abattoirs, fodder production and more. Too often, these contributions to local economies are noticed only when herders disappear
- Studies of alternative investment possibilities often overlook the significance of ‘key resources’ (see Box 3) and therefore underestimate the impact that converting certain especially important areas can have on pastoralists.<sup>36</sup>
- The true value of livestock is often not in the final sale value of meat: animals produce milk and manure, provide transport, plough fields, and are the basis of savings. For example, assessments of agropastoral cattle systems in southern Africa show that draft power (pulling ploughs or hauling goods) is the most significant value, followed by milk and manure, with beef production in fourth place. This contrasts sharply with ‘commercial’ beef production systems that prioritise meat production above all else and celebrate their improved ‘efficiency’.<sup>37</sup>
- Pastoral systems also provide other rarely recognised functions like credit, loans, social insurance, and informal risk pooling and sharing. The value of flexibility and the capacity for adaptation — including to climate change — is huge. These may be central to the total value of livestock in the eyes of producers, and they contribute to the resilience of communities.
- Well-managed pastoral systems can contribute to maintaining, sustaining, and even regenerating landscapes and ecosystems (see section 9). The environmental contributions of pastoralism are significant and need to be part of the assessment of alternatives.

What we mean by ‘value’ must go far beyond the cash value of pastoralists’ products. Valuations need to take into account the diverse social and economic contributions pastoralists make to their communities, territories, and ecosystems.

## Commercialising pastoralism

Even when policymakers acknowledge the importance of pastoralism, they often argue pastoralists need to be more ‘efficient,’ and more embedded in formal markets. However, pastoral areas are littered with an archaeology of failed marketing projects and attempts to ‘improve’ pastoral livestock through breeding programmes, fattening systems, and so on.

In fact, pastoralists do actively engage with markets, just not in the way that such projects imagine. They are often closely linked to local, national, and export markets. They must negotiate huge market uncertainties, and pastoralists work with brokers, traders, transporters, and others to increase reliability.

For example, in Sardinia in Italy, sheep herders engage in very different markets: commercial ‘livestock entrepreneurs’ sell their milk mainly to Pecorino Romano manufacturers exporting to the United States, while others sell to a range of outlets from large commercial processors to small, artisanal, or co-operatively run dairies or make their own cheeses local and informal markets. Understanding complex markets and how they interact is essential to supporting pastoralists effectively.<sup>38</sup>

The basic ignorance about and misunderstanding of pastoral livestock systems — their value, and their diverse forms of market engagement among policymakers, donors, and others — means that pastoral areas are often neglected or even destroyed by poorly thought-out investments. Yet the market- and non-market value of pastoral production is huge and may far outweigh that of other possible uses for these lands and territories.

It is therefore critical to realise the diversity of values and forms of market interaction through a more sophisticated approach to measurement and accounting as well as market assessment. This can help us to recognise the values inherent in multiple forms of pastoralism and embed this in policymaking.



Photo 4 - Credit: Nipun Prabhakar

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# Are meat, milk and other livestock products important for people's diets?

Is meat or milk good for you? There is no simple answer to this question. Modern Western diets that include large quantities of animal products and processed foods are linked with significant environmental and health impacts, but does this mean we should all switch to plant-based diets?

Various studies have tried to suggest an 'optimal' diet for people and the planet. The most famous is the 'EAT Lancet global reference diet',<sup>39</sup> which made the case for massive reductions in red meat consumption across the world — particularly in richer, Western countries. However, the report has been widely criticised for being too simplistic. The dietary recommendations, for example, suggested that red meat consumption should decline even in Africa. But for whom, and where? Finally, questions have been raised about the affordability of plant-based or industrially-produced meat and dairy alternatives.

A more nuanced discussion would start from questions of distribution (Who eats what?), nutritional content (How can people get essential nutrients for a healthy life?), and affordability (How can poor people get decent nutrition?).

Debates around food sovereignty raise a number of fruitful questions about how we should transform our food systems, who should be in control of that transformation, and what kind of food system we should aim for.

## Distribution, nutrition and affordability

Consumption of animal source products is highly skewed, with rich elites consuming far more globally. The contrasts are stark. In 2014, the average person consumed around 43 kg of meat, but this ranged from over 100 kg in the United States and Australia to only 5 kg in India.<sup>40</sup> National figures also hide huge variation within each country.

These patterns have changed dramatically over time. Today over 80 billion animals are slaughtered each year for meat. The world produces over three times as much meat as it did 50 years ago, with around 340 million tonnes consumed in 2018. During the same period the consumption of milk doubled, with 800 million tonnes now consumed annually.

While many traditional diets do include some meat, most nutritionists agree that consuming a lot of animal products, especially processed meat, harms people's health. While it's perfectly possible to lead a healthy life consuming an entirely plant-based diet, certain nutritional deficiencies can arise for people who struggle to gain access to an adequate and balanced diet. Meat and milk can be incredibly valuable sources of high-density protein and particular micro-nutrients.

Much recent discussion about meat-eating focuses specifically on 'protein', but this can blind us to a more holistic vision of healthy diets in their social, cultural, and ecological context. Malnutrition is widespread in many parts of the world, resulting in physical stunting and effects on brain development. Studies in east and southern Africa as well as South Asia, highlight deficiencies in iron, vitamin A, zinc, vitamin B<sub>12</sub>, folate and calcium.<sup>41</sup> These are highly bio-available in animal food sources. Significant volumes of plant-based foods would be needed to replace these.<sup>42</sup> Animal source foods can be especially important for young children and for pregnant and breastfeeding mothers, providing maximum nutrition in relatively small quantities at crucial moments.

Studies in Africa and Asia show that animal source foods, together with green leafy vegetables, are the most affordable per unit of available nutrients. This means buying liver, beef, milk, eggs, and dried fish makes sense for people struggling to make ends meet, where these foods are culturally acceptable. They provide an array of nutrients in a concentrated and affordable form. However, where available and affordable animal source products are highly processed, produced in environmentally-damaging ways, or preserved with potentially harmful additives, many of these benefits are lost.

The root causes of inadequate diets include economic inequality, lack of access to land to produce food, loss of access to local and open-pollinated seed varieties, loss of access to traditional fishing grounds or common lands, and lack of political control over food systems. Policies oriented unilaterally towards a 'protein transition' will miss much of this complexity.

Many people choose not to eat (some or all) animal products for religious or ethical reasons. Taking 'access to culturally appropriate' foods seriously means respecting these convictions. An argument for the importance of pastoralism does not undermine this in any way. At the same time, pastoral systems can provide an alternative to intensive meat production that may also be far better for animal welfare.

As Fernando García-Dory from the European Shepherds' Network explains: 'pastoralists care for the flock as a collective, protecting thousands of years of breeding through conserving and indeed enhancing biodiversity... It is a symbiotic relationship of care, between pastoralists and animals.'<sup>43</sup> Realising the potentials for more regenerative, sustainable, and caring forms of livestock production will encourage more nuanced discussions of the food system we want and need (see section 10).

## The politics of food systems

Who has the right to proclaim what a 'good' diet is, and who controls what diets are available to whom? How can low cost, high quality nutrient-rich foods be made accessible rather than poor quality food produced at the expense of animals, landscapes, ecosystems, and workers?

Control over food systems varies immensely across the world, but corporate concentration has reduced choice, especially for poorer people. Choosing a healthy diet — whether plant or animal sourced — is much easier for richer consumers. Making profits off cheap food often means off-loading poor-quality, processed food on the poor. This is the basis of the 'big meat' (and dairy) businesses that dominate global production with major negative impacts on environments, diets, and welfare.<sup>44</sup>

As debates about animal- and plant-based diets heat up, many of these companies have begun producing meat and dairy 'alternatives'. Investments in 'cultured' meats, bio-fermentation systems and plant-based products have grown massively in



recent years. This has been accompanied by much hype and intensive advertising, often offering exaggerated promises of a 'greener' food system.<sup>45</sup>

These alternatives are often promoted with a particularly narrow form of 'nutritio-nism'<sup>46</sup> that ignores the ecological, social, and political contexts of food choices.<sup>47</sup> New diet choices for the well-off do not address wider nutritional challenges. Nor are they necessarily healthy, depending on texturing agents and other ad-ditives. Meanwhile, their environmental impact may be worse than low-impact meat production, given the fossil fuel requirements of energy-intensive factories.<sup>48</sup> Environmentalists have sometimes promoted these 'alternatives,' as a way to re-duce the scale of animal agriculture, freeing up land for other uses (see section 9). However, these technologies on their own do not move us closer to a just and re-generative food system. Instead, they can deepen our reliance on a small number of industrially-produced commodities, strengthen corporate control of our food system, and make it more difficult for people to exercise political control over the food they eat and how it is produced.

We must therefore be careful about simplistic statements about dietary change. While eating less meat may be an important way for rich consumers to reduce their environmental impact and improve their health, this prescription is not true for everyone everywhere. Focusing exclusively on dietary change can distract us from a wider vision of food system transformation that reduces the power of cor-porations and puts political control of the food system into peoples' hands. Pastoral production systems in marginal areas must be central to such transformations.

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# How are pastoralists threatened by resource grabbing?

Pastoralists rely on extensive rangelands to sustain their animals, often moving between different pastures. This kind of access has long been threatened by colonial settlement policies, the expansion of both agriculture and conservation, and the growth of cities and infrastructure. All of these processes are accelerating today.

The term 'land grabbing' refers to the capture of control over land and associated resources like water, minerals, or forests (see [The Global Land Grab](#)). Whether through the market or by other means, access to and control of the resources people need to live decent lives are taken out of their hands and often concentrated in the hands of a few powerful players.

The processes driving 'land grabbing' came to a head during the 2008 food and financial crisis: investors around the world saw land as a safe investment, offering new ways to make money. Investments in land were portrayed as ways to 'feed the world,' or 'develop backward areas.' State elites fed this process by emphasising the presence of large areas of 'empty' or 'idle' land available for investment.

Land grabbing can take place through a variety of different mechanisms. David Harvey has described this process as 'accumulation by dispossession', and identified the role of privatisation, financialisation, 'the management and manipulation of crises', and state redistribution.<sup>49</sup>

Crises are often used as a pretext for grabbing: drought, climate change, ecological decline, or pandemics may be manipulated to generate narratives of 'crisis' that suit particular interests and exclude pastoralists, or compel them to settle. Tax breaks for investors and fast-track planning permissions, justified by crisis conditions, often favour investors over local producers.

Transforming land uses is also increasingly presented as part of a solution to the climate and biodiversity crises. 'Green grabbing' in the name of biodiversity conservation, renewable energy production, and carbon forestry has accelerated in pastoral areas.

## Pastoral areas as frontiers of extraction and enclosure

Due to their remoteness, lack of infrastructure, and the challenges presented by non-irrigated agriculture, pastoral areas were not initially targets of land grabbing. But the growth of infrastructure — especially roads and other transport corridors — are transforming such regions into new investment frontiers.<sup>50</sup> With sparse populations, pastoral areas are often seen as ‘empty’, idle ‘wastelands’ thirsty for investment. Valuable areas, such as riverine grazing, are targeted for agriculture, tourism, or wildlife use. However, these are ‘key resources’ in pastoral production systems (see section 3) and their removal can be disastrous.

Investments in pastoral areas are a mixed blessing. Increased access to markets, services and nearby towns have both advantages and disadvantages. As towns expand, private speculation in land is common. As urban areas with services like education and health care become more attractive, this changes the pastoral economy, and people are less able to defend their territories. These changes put pressure on pastoralists, deepening inequality, and threatening livelihoods.

## The politics of investments in pastoral areas

Discussions of ‘land grabbing’ often emphasise the role of corporations, especially transnational corporations. However, businesses do not act alone. In most cases, corporations act together with state officials and local elites, including wealthy pastoralists.

However, pastoralists are not passive players. Large-scale investments are always spaces of struggle as local communities reshape plans in unexpected ways (see Box 9). The visions and political agency of herders, small-town entrepreneurs, and local elites, and the alternative visions of ‘modernity’ and development that they put forward, can shape these projects and initiatives into new forms.

## BOX 9

### Negotiating energy investments in Kenya's drylands<sup>51</sup>

Around new geothermal developments in Baringo in Kenya's northern Rift Valley, Pokot elites are at the forefront of land privatisation, fencing valuable plots along new roads that connect geothermal sites with national infrastructure. Other dryland residents — small-scale pastoralists and dryland farmers — have a wide range of views, from outright opposition and resistance to accommodation in anticipation of personal benefits.

Sometimes resistance to investments is mobilised through protests. For example, those living near the Lake Turkana wind power site in northern Kenya blockaded roads to protest their alleged exclusion from benefits including compensation (for sand extraction and tree felling) and access to jobs. However, there is no uniform opinion or interest: while young people seek an economic foothold, elders agitate to uphold grazing rights and women seek opportunities as cleaners and cooks for contractors.

Also in Turkana, tensions have emerged around oil investments. Despite attempts at 'participatory' and 'consultative' processes, there is little consensus. Some welcome the investments, while others object. The devil is always in the details. Peoples' support depends on how they are included and stand to benefit. Attempts at co-option through 'participation' are often insufficient to bring about consensus.

Large-scale investments — whether for 'green' energy, conservation, or agriculture — are 'seen' differently by investors, state officials, local elites, and pastoralists themselves.<sup>52</sup> Even amongst these groups there are divergences: between men and women, rich and poor, young and old. Outcomes emerge through political and social contestations between competing visions around the potential benefits and costs of an investment, involving intensive power struggles.

These disputes raise important questions: Who are the investments for? Whose interests do they serve? What are the consequences for local economies and politics? As many cases show, the answers are not always obvious. There are both winners and losers.



Photo 5 - A herd of yaks graze on the edges of Lake Kokonor. In recent years many pastoralists have lost pasture due to the lake's expansion. Credit: Palden Tsering

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# Are conservation and pastoralism compatible?

Pastoralists are often pitted against conservation. Parks are created to keep livestock and people out, and stories about pastoralists invading conservation areas during drought, sometimes resulting in conflict and violence, are common. Pastoralism is of course not compatible with a style of conservation that encloses and excludes, but other kinds of conservation are possible.

An exclusionary style of environmental management, sometimes referred to as 'fortress conservation', originated in the United States with the establishment of the first national parks. This practice has since spread across the world. However, the best protected areas around the world are those managed by local people, not militarised park authorities. As Box 10 shows, pastoralists are accomplished conservationists.



Photo 6 - Sardinian pastoralists accompany their grazing herd in a mountain pasture.  
Credit: Giulia Simula

## Pastoralists as conservationists<sup>53</sup>

Mobile grazing both responds to and creates environmental variability. Concentrated dung and urine around shade trees or water sources create patches of rich soil. This is essential to biodiversity.

- Light grazing and trampling can enhance plant biodiversity, while mobile grazing allows patches to regenerate. Diverse plant life supports diverse insects, reptiles, and birds.
- Grazing animals can enhance plant populations by spreading seeds across landscapes.
- Herding routes are important bio-corridors. They link protected areas and other biodiverse environments.
- Key resources for livestock feeding and watering are also crucial for migrant bird populations. Pastoralists help to maintain these.
- Livestock and valuable keystone species, like vultures, often live side-by-side in pastoral ecosystems.
- Grazing reduces the build-up of dry grass, lowering the risk of intense fires. More frequent and intense fires have been linked with falling pastoral populations.

'Community-based' conservation models — from CAMPFIRE in Zimbabwe to collaborative forest management in India — have had some success, allowing local people to benefit from wildlife and forests.<sup>54</sup> This helps protect vulnerable ecosystems and endangered wildlife. Communities with claims to these lands long before conservation areas were created are compensated through hunting or tourist revenues. However, the experience of such schemes has been uneven. Benefits did not always reach local villagers, with money siphoned off by elites and local authorities.



Today, ‘fortress conservation’ is back on the table. High-profile international initiatives are urging countries to protect 30 per cent or even 50 per cent of the world’s surface in conservation areas — often without addressing what this would mean for traditional users.<sup>55</sup> Investments in more participatory forms of conservation have declined in many places, even as ‘climate finance’ and ‘carbon offsetting’ investments increase. Even if projects make some concessions to communities, **violence against local people**, now redefined as poachers, is frequent and sometimes brutal.

Rangelands are some of the most biodiverse areas on the planet. For centuries, herders and livestock have co-existed with wild herbivores in these landscapes. With the support of mobile ‘herder conservationists’, livestock, people and wildlife can co-exist.<sup>56</sup> When pastoralists are not centrally involved in conservation projects, conflicts occur (see Box 11).



Photo 7 - Kinna residents gather to condemn extrajudicial killings by Kenya Wildlife Service rangers in May 2020. Collective response to crisis is a vital strategy for pastoralists in town to manage variable conditions such as conflict and insecurity. Credit: Nura



## Community conservation and pastoralism in northern Kenya<sup>57</sup>

Major disputes have arisen recently around the expansion of so-called community conservancies in Kenya, organised under the auspices of the Northern Rangelands Trust (NRT) and supported by international donors and conservation organisations. Forty-three such conservancies now cover 42,000 square kilometres.

The model is presented as a sustainable, community-led initiative in support of pastoral regions. But there are serious questions about which 'community' representatives are involved, and whether all interests are represented. Given its scale, the NRT takes on many state-like functions and is massively influential in the region but is a mainly foreign-funded international NGO.

Pastoral communities are very much divided, and there have been protests and petitions against the conservancy model. While some argue that taking over community land for wildlife brings benefits like security, pastoral uses may be excluded, and only certain people benefit.

NRT argues that it helps run the conservancies on behalf of the people, but not everyone agrees. Questions of land access are highly political with rich elites and foreign investors apparently benefitting at the expense of local pastoralists. This leads to on-going conflicts.

## Bring down the fences, let (some) animals roam

Many wildlife conservationists recognise that restricted parks are not the best way to protect animals, especially large ones like elephants. They need space to move, and fences and national borders interfere with this. This is why the idea of 'trans-boundary' or 'transfrontier' conservation emerged, based on principles of ecological

connectedness. Initiatives launched across southern Africa, including the 500,000 km<sup>2</sup> Kavango-Zambezi Transfrontier Park, have aimed to bring down fences and integrate livestock grazing and other human uses into a wider system.<sup>58</sup>

The challenges for such initiatives are huge, however. Livestock mixing with wild-life may be exposed to diseases like foot-and-mouth, creating barriers to the sale of their meat or milk. Even when fences are removed, conservation projects limit pastoralism and other human uses, often leading to conflict. And visions of an 'ideal' landscape can differ markedly. Conservation driven by tourism and external investment often focuses on charismatic large animals like elephants and giraffes, sometimes neglecting the overall flourishing of biodiverse landscapes. Without dialogue about what landscapes are used for and how, pastoralists are often silenced.

These issues come into especially sharp focus in debates about 'rewilding', particularly in heavily populated and farmed landscapes in Europe. Rewilding is 'the large-scale restoration of ecosystems to the point where nature is allowed to take care of itself. Rewilding seeks to reinstate natural processes and, where appropriate, missing species.'<sup>59</sup>

Advocates argue that rewilded landscapes are more biodiverse. Livestock like sheep have sometimes been vilified as enemies of 'natural' landscapes, although some see room for low-intensity livestock systems within rewilded landscapes. The question of what is 'natural' is, of course, deeply contested and peoples' assumptions, biases, and aesthetics shape the types of landscapes they envision.

## Convivial conservation

Most biodiversity exists outside parks, in lived-in landscapes, preserved by people as part of their natural heritage. Excluding pastoralists provokes conflict and reduces landscapes to open-air zoos. At the same time, exclusionary conservation that undermines pastoralist livelihoods and celebrates a naïve idea of 'wild nature' centred around a few charismatic animals is receiving strong and growing support, including major funds.

So what is the alternative? Starting with people in particular places, thinking about cultures and local practices, and working with existing livelihood systems, not against them. Rather than relying on myths of ‘wild nature’, conservation can be rooted in existing systems of landscape use, incorporating the benefits of extensive livestock systems.

This is sometimes called ‘convivial conservation’, a holistic perspective that connects people with nature, ‘incorporating the needs of humans and non-humans within integrated and just landscapes’.<sup>60</sup> This perspective rejects ‘fortress conservation’ and seeks alternatives based on local knowledge and experience. It means a radical shift in power relations, with local people, including pastoralists, in charge.

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# How are pastoralists organising to defend their livelihoods and their environments?

Pastoralists live on the margins, often out of the orbit of state power, away from population centres, in places that are poorly connected and networked. This means that pastoralists generally have limited representation in formal circuits of power, whether of the state, or in terms of influence with business, NGOs, or donors.

As a result, pastoralists have little voice in policy debates that affect them, from investment programmes to aid efforts.<sup>61</sup> If pastoralists are to be more centrally involved in their own development, then this has to change.

## Seeing like a pastoralist

As a consequence of marginalisation there are often two contrasting views of development. The ‘view from the centre’ — from largely urban or agrarian populations, influenced by a modernising, Western vision of development — and the ‘view from the margins,’ from pastoralists living with and from uncertainty. Following James Scott<sup>62</sup>, Table 2 contrasts these two views.

These are of course broad strokes, not universally shared within either grouping. But the tension between world views is real and present. This primer has shown how the ‘view from the centre’ can make pastoralists’ experiences, needs, and solutions invisible. These views are deeply embedded so that even allies may unintentionally adopt the ‘view from the centre’ and fail to understand pastoralists’ realities. More and deeper dialogue is needed to understand how terms like ‘agroecology’ and ‘food sovereignty’ can apply to pastoralists, and how the pastoralist world view can strengthen, expand, and enhance these frameworks.

TABLE 1

## Contrasting ways of seeing pastoral development<sup>63</sup>

Issue	View from the centre (Seeing like a state, investor or development agency)	View from the margins (Seeing like a pastoralist)
Climate and environmental change	Pastoralist as villains and victims; pastoralists need to be settled and livestock reduced to protect the environment	Pastoralists as low-impact producers; responding to variability is the basis of production, central to a way of life
Markets	Uneconomic, weak, thin, informal, backward markets, in need of modernisation, formalisation, regulation	Vibrant cross-border trade linked into regional/global markets, constrained by state. Informality is a strength
Agriculture	The future, a route to settlement, civilisation, and profit	A temporary stop-gap, but linked to pastoralism, especially flexible locally-controlled, small-scale crop production
Technology	Innovation/modernisation (range management, breeding etc.) urgently needed to improve 'primitive' livelihoods	Appropriate technology, mixing old (mobile pastoralism) with the new (mobile phones, internet etc.)
Social protection	Aid programmes and safety nets, externally designed and imposed.	Mutual support networks and informal interactions, culturally-rooted and dynamic.

## Pastoralist voices

How can pastoralists articulate their diverse perspectives, including with potential allies? This question is increasingly urgent as pastoralists, peasants, and small-scale fishers all confront the common challenges of neo-liberalism, corporate-captured 'climate action,' and land and resource grabbing. The forms of local organisation

— family, clan or community level — that pastoralists use so effectively around well management, disease control, drought response, or herding often do not extend well to wider social and political organisation.

This may be changing. Pastoral communities are becoming more connected politically. New forms of activism are helping to mobilise them. However, being mobile and dispersed makes organising difficult. The great diversity of pastoralists — along lines of gender, generation, levels of education, and linkages with urban communities — creates additional challenges. Yet there are still opportunities for collective action.

For example, in France herding associations lobbied for the *Loi Pastorale* in 1972, which enhanced their rights over pastoral territories. In Spain pastoralist women are some of the most organised, vocal, and well-represented in social and conventional media. Across Europe, shepherds' schools are providing opportunities for the next generation to learn about pastoralism, building practical skills and learning to advocate for a new style of pastoralism. In the UK, pastoralists have become media stars, presenting the arguments about the changing countryside, farm policies, and the importance of regenerative agriculture and high-quality meat and dairy production, providing new visibility for pastoralism.<sup>64</sup>

Many places have begun to move towards decentralised forms of government, sometimes including specific representation for people from pastoral areas. For instance, there are now legislative provisions for resource management through 'pastoral codes' in the Sahel. These grant specific recognition of pastoral rights. As pastoralists obtain formal education and move to urban areas, they may take up political offices, while retaining strong links to their homes and communities.<sup>65</sup> Although such elite representation can be problematic, it can also provide pastoralists with new access to decision-making processes.

In many pastoral areas, the state is largely absent so these links may be irrelevant. Here, locally-organised pastoralists provide services, organise markets, enhance security, and deliver development — as is the case in parts of Somalia. That said, struggles for autonomy in some pastoral areas where disillusionment with the state is extreme have created problematic alliances between pastoralists and anti-state forces like jihadist groups.<sup>66</sup>

Meanwhile at the global level, the World Alliance of Mobile Indigenous Peoples (WAMIP) aims to raise the voice of pastoralists, generating solidarities across the world.<sup>67</sup> The network relies on constituent organisations that may be weak or under-resourced, may have different political orientations, and do not always work closely together. Nonetheless, this co-ordination is helping to create space for the diverse voices of pastoralists to be heard.

Pastoralists are also continuing to work with other allied movements, like La Via Campesina and affiliated organisations,<sup>68</sup> as well as advocating within and through organisations like the United Nations Food and Agriculture Organisation.<sup>69</sup> The International Year for Rangelands and Pastoralists in 2026 also provides an important focus for campaign efforts.<sup>70</sup> All of these initiatives can help to shape new narratives about pastoralism and pastoralists, recognising their place in a sustainable and just future.

In sum, the organisation of pastoralism is fast-changing, with pastoralists working to build new alliances and assert their relevance in the contemporary world. This requires countering false, outdated, or oversimplified understandings of pastoral ways of living, and their place in landscapes and ecosystems. There are opportunities for progressive alliances, not only with peasant and food sovereignty movements, but also with climate and environmental justice movements, as well as perhaps with migrant workers, small-scale fishers, people practising shifting cultivation, and others whose livelihoods are poorly understood and threatened.

Building these alliances requires recognising the common challenges — of neo-liberalism, resource grabbing, and, often, authoritarian state power or sustained neglect — that confront pastoralists and so many others.

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#### LINKS

- [Home | International Year of Rangelands and Pastoralists Initiative \(iyrp.info\)](https://iyrp.info)

# Can pastoralists show us the future?

Over millennia, pastoralists have learned to live with and from uncertainty. They have built sustainable livelihoods on marginal rangelands. Their products are vital for local communities and the wider nutrition of many. In the meantime, livestock also provide manure, draft power, transport, and more. Pastoralists do not destroy the planet, and in fact can enhance biodiversity, sequester carbon, and improve landscapes. As guardians of large areas of the world's surface, pastoralists are vital for the future of the earth.

As our institutions, policies, and practices struggle to keep up with a rapidly-changing, turbulent world, pastoralists also have much to teach us about reliability, adaptation, and flexibility in the face of uncertainty.

This primer has highlighted a number of features of pastoralists' livelihood practices that emphasise living with and from uncertainty. These include:

- Cultivating and maintaining knowledges and capacities to respond to high variability and generate reliability in uncertain settings.
- Mobility and the ability to respond to spatial and temporal variabilities.
- Flexible responses to property and tenure through diverse forms of land control, open forms of resource use, and commoning.
- Real markets embedded in social relations able to respond to variability.
- Dynamic social formations, linking individuals via households to kin, clan, community and wider networks to share information, redistribute wealth, and support each other.
- Solidarities and collectivities as the basis for redistributive 'moral economies', so that people do not face uncertainties alone.



All of these qualities are vital for pastoralists, but what about others who have to respond to variability and confront uncertainty on a daily basis? What about bankers, financiers, migrants, disaster relief agencies, or those managing critical infrastructures like electricity and water supplies? Instead of seeking control, it is essential to manage uncertainty and avoid the dangers of ignorance.

This requires very different skills and capabilities, and a radically different policy framework for addressing crises and disasters. For example, in the 2008 financial crisis the regulatory systems that assumed prediction, management, and control unravelled. With global trading in complex derivatives happening in fractions of a second, no-one knew what was going on in real-time, and volatility spread. According to Andrew Haldane, then the chief economist of the Bank of England, in the build-up to the financial crash, many bankers had ‘an exaggerated sense of knowledge and control’. While a few actors managed to profit enormously, many more suffered. The very features central to how pastoralists respond to uncertainty — relying on diverse sources of knowledge, learning adaptively through networks, and navigating uncertainty through social relations — were absent. Reflections on these lessons illustrate the importance of system-level understandings, the ability to respond to surprise, and breaking up networks across dealers and banks, so that human interactions and relationships can be supported.

The principles that pastoralists follow in responding to uncertainty, ignorance, and surprise therefore have much wider relevance. All of us can learn from pastoralists, whether in relation to pandemics, climate change, migration, natural disasters, or financial volatility.

As we see in the relics of failed development projects in pastoral areas, the impetus to control is futile, even dangerous. Instead, a much more open, accountable, convivial and caring approach is suggested as an alternative. The principles of pastoralism — centred on plurality, flexibility, learning, sharing and commoning — can become a core set of practices for a world where uncertainty is everywhere (see Table 3).

Seeing like a pastoralist — and moving from ‘control’ to ‘care’ — can provide valuable insights for the growing number of people and organisations struggling to respond to various uncertainties.

TABLE 2

## Control versus care: contrasting approaches to responding to uncertainty<sup>71</sup>

Situation/topic	Control	Care
Responding to variable, uncertain conditions	Risk assessment and management, predicting the future	Embracing uncertainty, looking out for ignorance
Design of interventions	Control, fixity, stability, sedentary	Open, flexible, mobile
Relations of authority and accountability	Hierarchical, top-down management, planning	Horizontal, networked, redistributive, collective, relational, convivial
Professionalism	Planning, procedures, protocols, standards	Reliability management, learning in real time, scanning and response
Territory and tenure	Locality, sovereignty, fixed property rights (individual, state, communal)	Open property, mosaics, movement, networks, fuzzy boundaries, commoning
Ecologies	Stability, ecosystem management, spatial uniformity, restoration, resilience (as bouncing back)	Non-equilibrium ecologies, instability, disturbance, resilience as relational, transformative.

Living with and from uncertainty requires an ethic of care and a rejection of control. As the keywords in the highly simplified table show, this suggests a very different way of thinking about and acting in the world. It would have profound implications for the design and practice of institutions, policies, movements and more. Seeing like a pastoralist allows us to imagine a new world that can embrace uncertainty. In this sense pastoralists can indeed show us the future.

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## VIDEO TALK

- Why embracing uncertainty means rethinking development - YouTube



Photo 8 - Pastoralists in Lun Mo Chee village in Amdo Tibet treat the yak as the most treasured animal. During the annually organized 'Dre Mo Beauty Contest,' female yaks compete for the championship and a cash prize. Credit:Palden Tsering

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Photo 9 - A Douiri woman in southern Tunisia plays with her goats. They only have a symbolic number to keep them company in their old age. Credit: Linda Pappagallo

# Endnotes

- 1 See Krätli 2019; FAO 2021; Manzano et al. 2021.
- 2 Adapted from Scoones (2021), where the sources can be found.
- 3 ILRI et al. (2021); League for Pastoralist Peoples mapping initiative: [http://umap.openstreetmap.fr/de/map/pastoralists\\_563977#5/53.318/-7.053](http://umap.openstreetmap.fr/de/map/pastoralists_563977#5/53.318/-7.053)
- 4 <https://viacampesina.org/en/food-sovereignty/>
- 5 PASTRES (Pastoralism, Resilience, Uncertainty: Global Lessons from the Margins), [www.pastres.org](http://www.pastres.org) and [seeing-pastoralism.org](http://seeing-pastoralism.org). For details of the examples, see <https://www.pastres.org/tag/natasha-maru/>; <https://www.pastres.org/tag/palden-tsering/>; <https://www.pastres.org/tag/masresha-taye/>; <https://www.pastres.org/tag/tahira-shariff/>.
- 6 Gardner (2019); <https://www.pastres.org/tag/linda-pappagallo>
- 7 Moritz (2016); Robinson (2019).
- 8 Krätli (2008)
- 9 Scoones (1991); Tache (2012)
- 10 Krätli and Provenza (2021), <https://pastres.org/2021/05/14/crossbreeding-or-not-crossbreeding-that-is-not-the-question/>
- 11 These cases come PhD students associated with the PASTRES programme ([pastres.org](http://pastres.org)). See videos, blogs and theses: <https://www.pastres.org/tag/palden-tsering/>; <https://www.pastres.org/tag/tahira-shariff/> and <https://www.pastres.org/tag/linda-pappagallo>
- 12 Swift (1996)
- 13 Davis (2016)
- 14 Davis and Robbins (2018)
- 15 Bond (2019); Vetter (2020)
- 16 Brandt et al. (2020)
- 17 <https://redd-monitor.org/2020/04/02/the-trouble-with-trees-the-african-forest-landscape-restoration-initiative-is-based-on-a-profound-misreading-of-africas-grassy-biomes/>
- 18 Adapted from: <https://www.ids.ac.uk/opinions/the-sahelian-great-green-wall-start-with-local-solutions/>
- 19 Turner et al. (2021)
- 20 <https://www.campaignfornature.org/background/>; <https://www.weforum.org/agenda/2020/01/one-trillion-trees-world-economic-forum-launches-plan-to-help-nature-and-the-climate/>
- 21 See multiple critiques, e.g., <https://www.greenpeace.org/international/story/50689/carbon-offsets-net-zero-greenwashing-scam/>
- 22 See, Ellis and Swift (1988); Behnke et al. (1993); Scoones (1994); Vetter (2005); Briske et al. (2003)
- 23 See, Behnke et al. (1993); Scoones (1994); Kerven (2004)
- 24 Konaka and Little (2021)
- 25 This section is summarised from: <https://pastres.org/2019/04/26/challenging-desertification-myths/>
- 26 Keeley and Scoones (2003); see also, <http://steps-centre.org/wp-content/uploads/IDS-Understanding-policy-processes.pdf>
- 27 Houzer and Scoones (2021), <https://pastres.org/livestock-report/>.
- 28 Cain et al. (2019)
- 29 <https://theconversation.com/cows-and-cars-should-not-be-conflated-in-climate-change-debates-171024>
- 30 Manzano and White (2019)
- 31 Vagnoni et al. (2017); Arca et al. (2021); see also <https://pastres.org/livestock-report/>
- 32 Zhuang et al. (2017); see also <https://pastres.org/livestock-report/>
- 33 Assouma et al. (2021); see also <https://pastres.org/livestock-report/>
- 34 <https://euideas.eu/2021/10/28/climate-change-we-need-to-talk-about-methane/>
- 35 See Hesse and MacGregor 2009; Krätli (2014).

- 36 See cases in Catley *et al.* (2012) by Behnke and Kerven and Tache (9781136255854.pdf (oopen.org))
- 37 Barrett (1992); Scoones (1992)
- 38 See, <https://www.pastres.org/tag/giulia-simula>
- 39 <https://eatforum.org/eat-lancet-commission/>
- 40 <https://ourworldindata.org/meat-production#which-countries-eat-the-most-meat>
- 41 Ryckman *et al.* (2021 a, b)
- 42 HLPE (2017); Nordhagen *et al.* (2020)
- 43 <https://pastres.org/2021/09/13/challenging-negative-views-of-pastoralism-in-europe-qampa-with-fernando-García-dory/>
- 44 Weis (2013); Schneider and Coghe (2021); <https://friendsoftheearth.eu/publication/meat-atlas-2021/>
- 45 Guthman and Biltekoﬀ (2020).
- 46 LeRoy *et al.* (2022), <https://www.publish.csiro.au/an/pdf/AN21237>
- 47 Clapp and Scrinis (2017), <https://www.tandfonline.com/doi/abs/10.1080/14747731.2016.1239806>
- 48 <https://aleph-2020.blogspot.com/2019/12/mock-and-cultured-asfs-future-of-food.html>; IPES-Food (2022), <https://www.ipes-food.org/pages/politicsofprotein>
- 49 Harvey (2003)
- 50 Chome *et al.* (2020); Enns and Bersaglio (2020).
- 51 Extracted from: <https://blogs.lse.ac.uk/africaatlse/2020/10/23/global-investment-dryland-eastern-africa-has-accentuated-inequalities-social-difference-in-frastructure/>; also Lind (2021).
- 52 Lind *et al.* (2020)
- 53 See [www.pastres.org/biodiversity](http://www.pastres.org/biodiversity) for a series of briefs with sources.
- 54 See, <https://www.campfirezimbabwe.org/>; <https://ageconsearch.umn.edu/record/16563/files/fo041108.pdf>
- 55 See Allan *et al.* (2022), who calculate that 1.8 billion people live on the 44 per cent of the world's land necessary to protect biodiversity. 80 per cent of the world's biodiversity is protected by indigenous peoples, who make up under 5 per cent of the world's population, <https://www.globalissues.org/news/2022/04/29/30728>
- 56 <https://pastres.org/2021/08/27/bring-back-the-herder-conservationists/>
- 57 See, Schetter *et al.* (2022); and for opposing views, <https://www.nrt-kenya.org/about-nrt> and <https://www.oaklandinstitute.org/sites/oaklandinstitute.org/files/kenya-stealth-game-community-conservancies.pdf>.
- 58 <https://wildlife.cornell.edu/our-work/ahead-animal-human-health-environment-and-development/beyond-fences>
- 59 <https://www.rewildingbritain.org.uk/explore-rewilding/what-is-rewilding/defining-rewilding>
- 60 <https://convivialconservation.com/the-book/>
- 61 Nori (2022 a-d)
- 62 Scott (2008)
- 63 See Catley *et al.* (2012), chapter 1, (9781136255854.pdf (oopen.org))
- 64 Including James Rebanks and Amanda Owen, authors of the best-sellers, *A Shepherd's Life* and *The Yorkshire Shepherdess*, both with regular appearances on TV and radio.
- 65 Lister (2004)
- 66 Ba and Benjaminsen (2019)
- 67 See, <https://wamipglobal.com/>; see also the pastoralist gatherings convened by the Pastoralist Communication Initiative and others, see: <https://www.pastoralists.org/community-engagement/> and <https://opendocs.ids.ac.uk/opendocs/handle/20.500.12413/2324>
- 68 See, <https://viacampesina.org/en/>; <https://afsafrica.org/>
- 69 <https://www.fao.org/pastoralist-knowledge-hub/forum/en/>
- 70 <https://iyrp.info/>
- 71 Scoones (forthcoming)



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PASTRES (Pastoralism, Uncertainty and Resilience: Global Lessons from the Margins, [pastres.org](http://pastres.org)) is a research programme that is learning from pastoralists in six countries about responding to uncertainty, with lessons for global challenges. It is supported by an Advanced Grant from the European Research Council.

<https://pastres.org>



WAMIP is a grassroot movement of pastoralist peoples, created in 2007 and committed to bringing their voices to the global arena, and to global coordination and support for food sovereignty and pastoralists' rights.

<https://wamipglobal.com>