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Convention to Combat Desertification

INFORMATION BRIEF

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Land Use Change and Rangeland Degradation

Mobile Pastoralism and Silvopastoral Solutions in South America

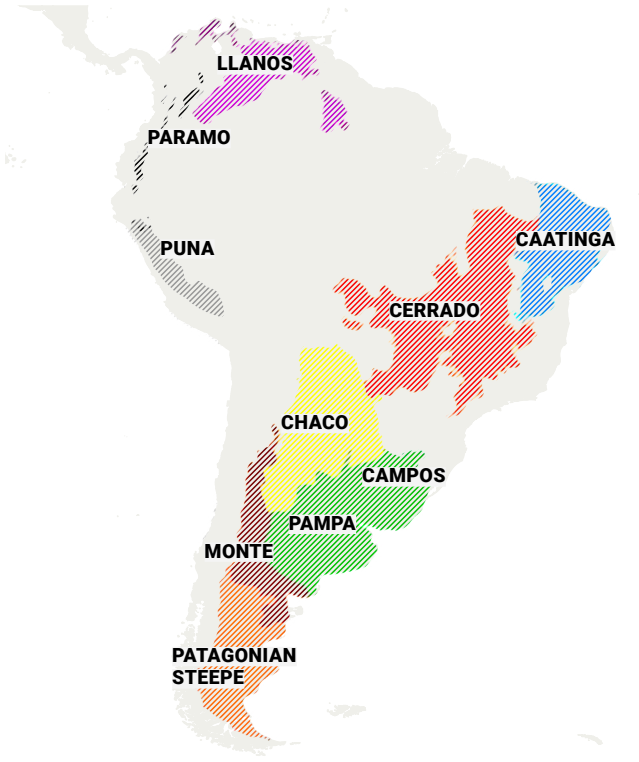
Rangelands consist of vast natural and semi-natural grasslands, shrublands, woodlands, and deserts which are grazed by either livestock or wildlife or both. Healthy, productive, and resilient rangelands provide a wide range of goods and services that support pastoral livelihoods and grassland communities and provide huge benefits for the society at large. They also regulate critical ecological functions on regional and global scales, including the carbon, nutrient, and water cycles. However, land use change and development pressures (e.g., cropland expansion, grazing management, urbanisation, infrastructure), and the effects of climate change (e.g., rising temperatures, drought, wildfires) pose significant challenges to the protection and restoration of rangelands and their communities worldwide.[1]

- The **Pampas** in Argentina, Uruguay, and Brazil are some of the most fertile temperate grasslands in the world. They cover an estimated area of 1.2 million km², while the adjacent **Campos** in Brazil and Uruguay (450,000 km²) refer to equally productive sub-tropical grasslands.
- The **Cerrado** (tropical savannah) and the **Caatinga** (arid shrubland) in Brazil cover an area of approximately 2.8 million km² and are predominantly grazed by goats and sheep, and to a lesser extent, cattle.
- The **Páramo** in the northern Andes and the **Puna** in the central and southern Andes cover roughly 45,000 km² of high-altitude grasslands that have been used for grazing camelids since the pre-Inca period, and more recently sheep and cattle.
- The **Llanos** in Venezuela and Colombia cover approximately 570,000 km² of tropical savanna with distinct wet and dry seasons. They are increasingly being converted into rice fields and oil palm plantations.
- The **Gran Chaco** in Argentina, Bolivia, Paraguay, and Brazil comprises dry forests, woodlands and shrublands spanning over 1.3 million km² and is increasingly dominated by large-scale, intensive agricultural production of crops and livestock.
- The **Patagonian Steppe** in Argentina and Chile is a cold, semi-arid desert covering around 750,000 km², primarily composed of xerophytic shrubs and grasses, and is used for wool production and oil extraction. To the north, the **Monte Desert** covers 450,000 km². It consists of temperate dryland on the eastern side of the Andes Mountains and is mainly used for continuous grazing of goats and sheep.

South American rangelands cover approximately 7.5 million km² – over 40 per cent of the total land area – and are distributed across regions with diverse biophysical and socioeconomic conditions. These rangelands include drylands and deserts, temperate and montane grasslands, as well as subtropical forests, savannas, and shrublands, with mean annual precipitation varying from arid (150 mm) to sub-humid (1,500 mm) biomes.[2]

South American rangelands are home to specialised flora and fauna that support pastoral and ranching communities, as well as other agricultural activities. These communities contribute substantially to the regional economies and cultural landscapes of many countries. In recent decades, the main challenges to the health and productivity of these areas have been livestock overgrazing, agricultural expansion, and climate change – factors that often interact to exacerbate rangeland degradation.

Figure 1 South American Rangelands[3]



Land Use Change and Rangeland Degradation

Land use change poses a significant threat to the biological and economic productivity of rangelands – the provisioning services on which pastoral livelihoods and food security depend – as well as their contribution to supporting, regulating, and cultural services, from local to global scales.

As in other parts of the world, land use change in the South American rangelands usually involves converting grazing lands and natural grasslands to other land uses, such as croplands, extractive industries, and urban areas. Although the conversion of rangelands to large-scale monocultures (e.g., soybeans) can be highly profitable in the short term, this transformation results in a loss of natural pasture land, habitat fragmentation, and soil degradation. Housing, roads, and other infrastructure development also reduce the extent and quality of rangelands available for grazing and nature conservation. Policy neglect, weak governance, and agricultural subsidies tend to encourage land use change and unsustainable management practices in the South American rangelands.[4]

The continuous and heavy grazing of livestock and wild animals is a growing concern in all South American rangelands, particularly in arid regions where soil and vegetation degradation can occur more rapidly. Soil erosion and compaction reduce the rangelands' capacity to absorb water, and the subsequent loss of vegetation makes the soil more vulnerable to erosion. Furthermore, overgrazing reduces biodiversity (both above and below ground) and the availability of high-quality forage, thereby decreasing overall rangeland productivity. In order to accommodate increasing numbers of livestock, some countries are rapidly converting forests and woodlands into pastures.[5]

South American rangelands are highly sensitive to changes in climate, particularly in terms of precipitation and temperature. An increased frequency and intensity of droughts and floods elevates the risk of forage shortages, forcing ranchers and herders to move their animals or sell them. Higher temperatures increase evaporation rates and water stress for native vegetation, reducing their primary productivity and making rangelands more susceptible to wildfires and invasive species.

Cropland Expansion in the Pampas and Campos

Beef cattle have been produced on these rich native grasslands since the 16th century, with relatively few external inputs. However, in recent decades, there has been a dramatic shift towards annual crop cultivation (e.g. soybeans), which has resulted in the loss of pastures and perennial crops. This transition is fundamentally altering the structure and function of these areas. For example, in rangelands where cropping has increased, livestock production has become more intensive and dependent on grain feed and fodder. In relatively intact grasslands, stocking rates have partially exceeded the carrying capacity of the land.[6]

Without regulatory or financial mechanisms that incentivise the sustainable management and restoration of these rangelands, the comparatively low profitability of extensive livestock production encourages above-optimal stocking rates, which is driving sustained intensification and land use change.[7] The *Alianza del Pastizal* is one of many NGOs working to support producers and conservationists in the region by advocating for and providing technical assistance on biodiversity-friendly livestock practices and certification schemes.[8]

Mobile Pastoralism and Silvopastoral Solutions

South American rangelands have supported a variety of indigenous livestock systems based on grazing, from the shearing of wild vicuñas and the herding of llamas and alpacas in the highlands, to the shepherding of sheep and goats in dryland areas.

Many of these traditional pastoral systems have co-evolved over millennia and are well adapted to rangeland biophysical and climatic conditions. Livestock mobility is a key strategy for making the most of variable resources (e.g. water and forage), ensuring food security and boosting community resilience. Mobile pastoralism is practised mostly in four countries: Argentina, Bolivia, Chile and Peru. In Argentina and Chile, it mainly occurs in marginal areas, where communities exploit environmental and economic niches to support their livelihoods. In Bolivia and Peru, it is an important economic activity that dominates the cultural landscape in the Andean highlands.[9]

In some countries, such as Brazil, Argentina, and Uruguay, ranching systems contribute substantially to total economic output and are particularly well-suited to agroforestry approaches that enhance the productivity, sustainability, and resilience of rangelands.[10] Agroforestry involves integrating trees and shrubs with crops and/or livestock and includes silvopastoral practices that combine trees with grazing lands. Some South American rangeland initiatives show great promise in expanding agroforestry schemes, restoring indigenous and traditional management systems, and implementing innovative approaches such as silvopastoralism.[11]

Mobile Pastoralism in the Puna and Páramo

In the Puna, interactions between humans and animals over thousands of years led to the domestication of camelids and the creation of two new livestock species: llamas (*Lama glama*) and alpacas (*Vicugna pacos*). Pastoralism in these montane grasslands was sustainable, involving extensive grazing by llamas, alpacas and, later, sheep (*Ovis aries*). This formed the basis for the livelihoods and food security of over one million indigenous people. For these disparate, low-density populations, mobility was a key coping strategy for dealing with highly variable water resources and climatic conditions, especially during drought periods. However, socioeconomic transformations in recent decades, including the expansion of mining activities in the region, have resulted in the large-scale abandonment of traditional pastoral livelihoods.[12]

In the Páramo, the conversion of native rangeland vegetation into cultivated grasslands for cattle, sheep, and goats, and to a lesser extent for crop production, exemplifies the region's modern production systems.[13] The Antisana Páramo in Ecuador, severely degraded after 200 years of cattle ranching, is now recovering thanks to land purchases and restoration activities by the Quito Water Conservation Fund – a payments for ecosystem services scheme partly funded by water users. The removal of livestock from this part of the watershed has allowed biodiversity and ecosystems to be restored, including native grasses, wetlands, and wildlife such as foxes, deer, and even pumas. This has significantly improved the quantity and quality of the water supply for the city of Quito, demonstrating how public utilities, companies, and local communities can collaborate to restore water resources and biodiversity.[14]

Ranching in the Gran Chaco

The permanent settlement of livestock and forestry concerns in the Gran Chaco in the early twentieth century marked the beginning of accelerated land degradation. This was exacerbated by forest clearing for cropland expansion and intensive livestock production in recent decades. The region is especially vulnerable to the impacts of climate change, such as prolonged droughts, floods, heatwaves, and wildfires. This vulnerability is increasing as a result of extensive ranching and limited groundwater resources.[15]

Since 1973, the non-profit organisation FUNDAPAZ has supported local and indigenous communities in recognising their land rights and developing silvopastoral management systems for the Chaco forest. These include restoring degraded land, while sustainably producing timber, meat, and honey, to improve livelihoods and food security. FUNDAPAZ also supports self-organised communities, collectives, and producer associations to ensure the long-term environmental and economic sustainability of these practices.[16] As large areas of the Gran Chaco are being deforested for soybean cultivation, silvopastoral approaches can provide alternative, ecologically sustainable livelihood strategies in these semi-arid rangelands, helping to reduce the pace of deforestation. Leveraging market-driven strategies, improving land governance, and collaborating with local stakeholders can incentivise silvopastoral management practices in the Gran Chaco that contribute to food security, biodiversity conservation, and climate change mitigation.[17]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National Commitments to Protect Rangeland Health

The importance of healthy and productive rangelands has been recognised by many South American countries, who have emphasised their valuable contribution to the social, economic, and environmental dimensions of sustainable development. Although normative frameworks have prioritised policies and legislation for the protection of these rangelands – in some cases, in response to commitments made under the Rio conventions and other multilateral agreements – their implementation and enforcement can be challenging.

- **Argentina** has committed to sustainable rangeland management through policies such as the National Forest Law, which supports the implementation of the National Principles and Guidelines for Integrated Livestock Management. The aim is to restore degraded land, improve soil health, foster vegetation recovery, and conserve biodiversity in its rangelands, particularly in regions like Patagonia.[18]
- **Brazil's** National Determined Contribution (NDC) to mitigate and adapt to climate change includes restoring forests and degraded pasturelands as core strategies for reducing deforestation. It involves recovering 15 million hectares of degraded pastureland, restoring 12 million hectares of native vegetation, and creating 5 million hectares of integrated crop–livestock–forest and silvopastoral systems by 2030.[19]
- **Uruguay** has committed to addressing the environmental challenges posed by the livestock sector through a holistic and sustainable approach that focuses on increasing productivity and efficiency. From 2018-2023, the Global Environment Facility financed the USD 2 million project "Climate-smart livestock production and land restoration in the Uruguayan rangelands", implemented by FAO and the Ministry of Livestock, Agriculture, and Fisheries.[20]

Challenges and Opportunities in the Cerrado and Caatinga

The Cerrado is the oldest and most biodiverse savannah in the world, as well as being the most carbon-rich. It is also an active agricultural hub, producing crops and livestock for national and global markets. However, since the 1970s, the region has suffered extensive land use change, degradation, and fragmentation due to agricultural expansion and overgrazing. An estimated one million hectares of native vegetation has been lost annually in recent years. The livelihoods of around 25 million people, including 80 ethnic groups, depend directly on the health and productivity of the Cerrado, which also provides 40% of Brazil's freshwater. According to Brazilian environmental law (Código Florestal), 25% of the Cerrado's natural vegetation must be preserved on private properties, and around 8% is legally protected by the National System of Conservation Units.[21]

WWF-Brazil supports public agricultural policies and the participation of the private sector to increase the scale of native vegetation restoration, rehabilitate degraded pastures, protect water resources, and improve the planning and management of conservation areas in the Cerrado. In 2018, WWF submitted a technical proposal to include forest restoration as an operating cost item in the government's annual Harvest Plan, together with Agroicone and other partners.[22] WWF strongly advocates for direct engagement with the private sector (e.g. traders, meat packing plants, financial institutions) to encourage farmers to restore forests and grazing lands, reduce environmentally harmful practices, and create incentives for more sustainable meat and soybean production chains.[23]

Home to around 27 million people, the Caatinga faces many of the same threats as the Cerrado. Cattle ranching and cotton farming have led to the loss of nearly half of its original native vegetation. Although conservation units in the Caatinga cover only 8 million hectares, sustained conservation measures have shown that it is possible to restore native vegetation and wildlife. The Caatinga Association, which owns and manages the Serra das Almas reserve, has encouraged the establishment of additional protected areas and provides support to 26 private reserves and three conservation units covering over 100,000 hectares. The reserve is home to more than 800 species of animals and plants, including the rare three-banded armadillo. Securing the Caatinga's native vegetation is crucial for ensuring a reliable water supply for neighbouring communities, and the association is now actively providing local water storage solutions.[24]

In many South American rangelands, multiple economic pressures threaten the health of the rangelands and other critical biomes, such as forests. For instance, the expansion of cattle ranching is a direct cause of deforestation, while the shift to soy production on pasture land forces pastoralists and herders to move their livestock into forested areas. However, by employing agroforestry and silvopastoral approaches, mobile pastoralism and livestock ranching can coexist and share resources to achieve synergistic outcomes. This requires integrated land use planning and inclusive governance systems supported by the state, which meaningfully engage all relevant stakeholders. Mobility, for instance, can help ensure that set-asides and resting periods are enforced, giving rangelands the opportunity to recover from external pressures, such as the impacts of climate change.

Funded by the Global Environment Facility, the STELARR project is working to reverse rangeland degradation and improve productivity in South America by promoting sustainable supply chains. It aims to increase investment in rangeland health by collaborating with commercial stakeholders across the livestock supply chain to direct their profits towards sustainable management and restoration activities. This will require forming alliances, strengthening evidence-based knowledge and practices, and developing monitoring frameworks suitable for use by the private sector. So far, the project has identified several potential target areas for rangeland interventions in South America. These include the Gran Chaco (beef value chains in Paraguay, Argentina and Bolivia), the Puna and Páramo (alpaca and other fibre value chains in Peru, Bolivia, and Ecuador) and the Pampas and Campos (beef value chains in Uruguay, Argentina, and Brazil). The project is leveraging existing initiatives such as the Alianza del Pastizal and Initiative 20x20.[25]


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International Year of Rangelands and Pastoralists 2026

The International Year of Rangelands and Pastoralists (IYRP) 2026 was endorsed by the United Nations General Assembly. In 2024, the sixteenth meeting of the Conference of the Parties (COP16) to the United Nations Convention to Combat Desertification (UNCCD) held in Riyadh, Saudi Arabia adopted the first-ever decision on sustainable rangelands management. In the same year, Mongolia's parliament adopted a Resolution setting out a roadmap for the IYRP and allocating funding for national actions in support of rangelands and pastoralists.

In August 2026, Mongolia will host UNCCD COP17, featuring the launch of the Rangelands Flagship Initiative – a global, multi-partner effort to increase investments in rangelands and pastoralist communities, with the aim of achieving land degradation neutrality and related development goals. The Initiative will support national and regional response measures (i) to increase the extent and integrity of rangelands designated as protected areas (in line with the Kunming-Montreal Global Biodiversity Framework under the Convention on Biological Diversity), (ii) to enhance climate change adaptation through sustainable rangeland management and restoration activities (within the Nationally Determined Contributions and National Adaptation Plans under the United Nations Framework Convention on Climate Change), and (iii) to strengthen drought resilience in rangelands through the Riyadh Global Drought Resilience Partnership announced at UNCCD COP16.

In the lead up to UNCCD COP17 and in support of the IYRP, an epic journey from Riyadh to Ulaanbaatar along the historic Silk Road will bring much-needed attention to these landscapes and their custodians, showcase countries' efforts in sustainable rangeland management and restoration, and advocate for increased political support and investment, culminating in a global call to action at COP17.[26]

Endnotes

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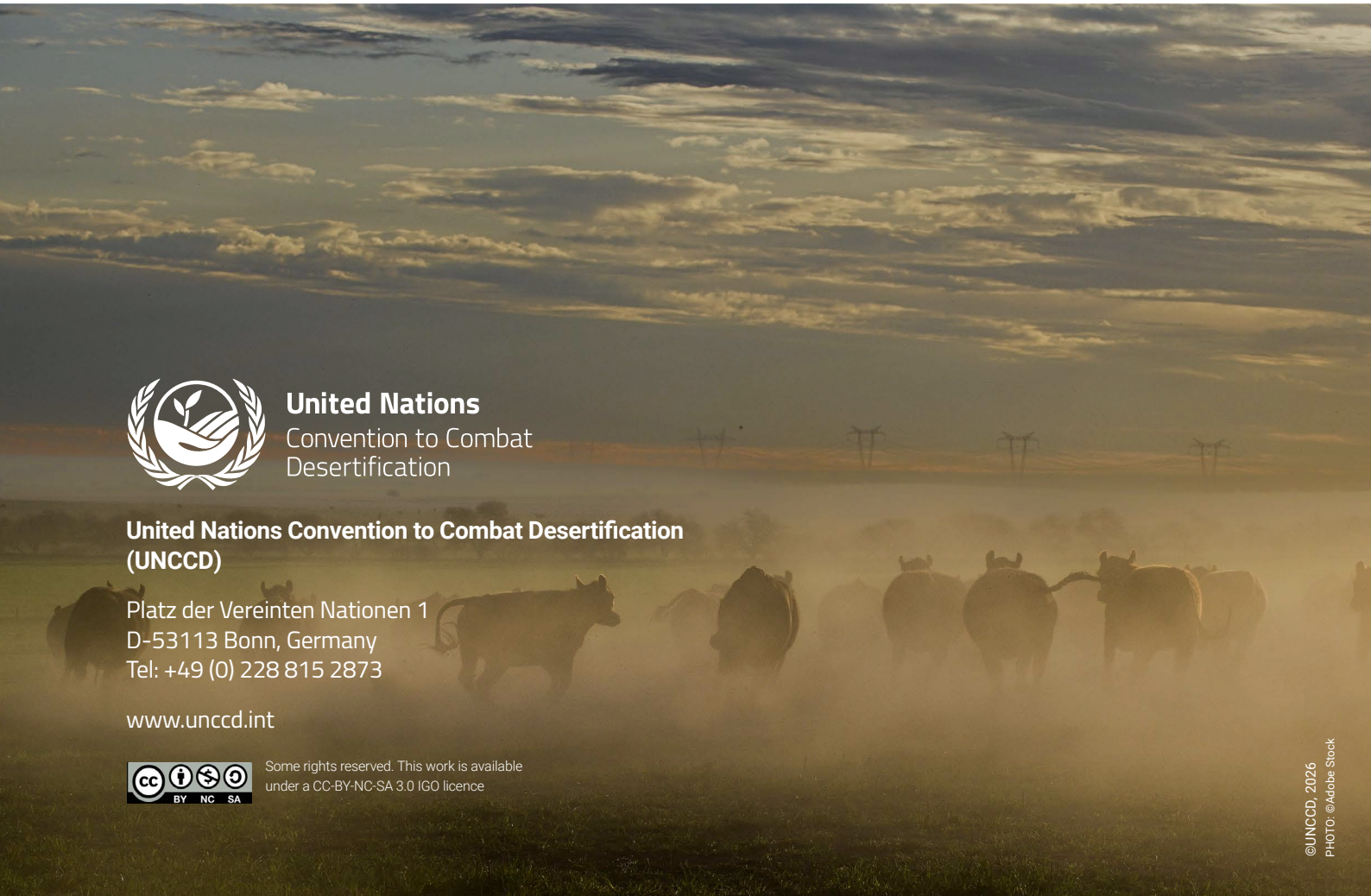

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