



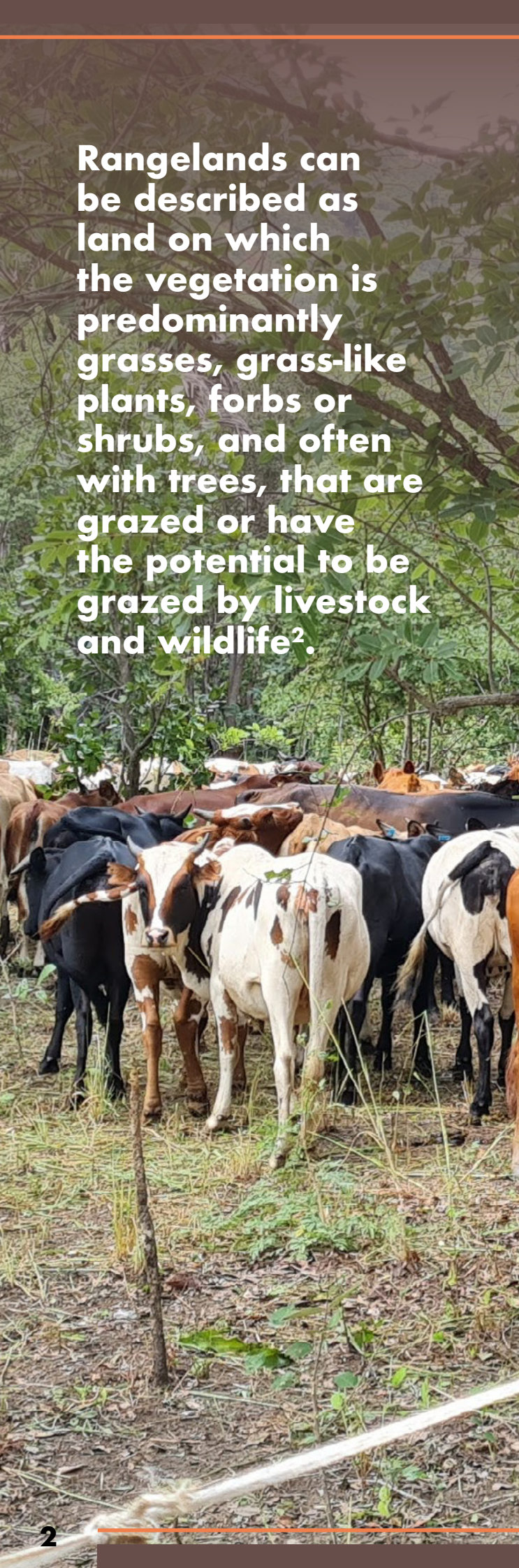
# REGENERATIVE GRAZING FOR CLIMATE, ECOSYSTEM, AND HUMAN HEALTH

The COP27 in Sharm El-Sheikh, Egypt, is the ideal venue to showcase two transformative land regeneration approaches developed in Africa: agroforestry and regenerative grazing management. These two approaches come together in silvopastoral systems - livestock grazing and browsing in tree-dotted grasslands - which have been ranked among the most effective carbon drawdown tools at our disposal<sup>1</sup>.



<sup>1</sup> <https://www.drawdown.org/solutions/silvopasture/technical-summary#:~:text=Project%20Drawdown%20defines%20silvopasture%20as,grazing%20on%20pasture%20and%20rangeland.>





Rangelands can be described as land on which the vegetation is predominantly grasses, grass-like plants, forbs or shrubs, and often with trees, that are grazed or have the potential to be grazed by livestock and wildlife<sup>2</sup>.

## THE EXTENT, STATUS AND VALUE OF GRAZING LANDS

Rangelands including silvopastoral systems (grasslands, savannas, and woodlands comprised of grasses and woody species) cover 54% of the global terrestrial surface and drylands globally make up 6.1 billion hectares<sup>3</sup>. The world's rangelands co-evolved with enormous herds of grazers over millions of years. Grazing built a treasure of extraordinarily rich soils, thereby creating our most productive farming regions.

Rapidly increasing land-use change in these areas—in particular, ploughing for crops—is releasing significant amounts of carbon from the soil, turning them into carbon emitters rather than the carbon sinks they had been. This despite the fact that much of this land is unsuitable for crop farming, even with the use of expensive irrigation and costly inputs. As a result, many of these lands are relegated to dustbowls. Alternately, with improved management these rangelands silvopastoral areas can generate an abundance of nutrient-rich food for wildlife and humans alike.

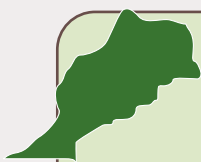
**However, these vast areas are deeply underinvested.** They are typically managed by pastoralists, a population that in many countries is marginalized and usually ignored by policymakers. And, yet, pastoralists have innate traditional knowledge on ecosystemic processes governing grasslands and their regeneration. As barbed wire and farmland spread across the landscape, migration patterns upon which pastoralism depends are blocked or disrupted. The combined pressures have led to a rapid decline in rangeland health: erosion is accelerating; droughts, floods and pests do greater damage; carbon escapes to the atmosphere; and functional, species, and genetic biodiversity deteriorates.

<sup>2</sup> ILRI, IUCN, FAO, WWF, UNEP and ILC. 2021. Rangelands Atlas. Nairobi Kenya: ILRI [https://www.rangelandsdata.org/atlas/sites/default/files/2021-06/Rangelands\\_web%20%28144%20dpi%29.pdf](https://www.rangelandsdata.org/atlas/sites/default/files/2021-06/Rangelands_web%20%28144%20dpi%29.pdf)

<sup>3</sup> FAO. 2019. Trees, forests and land use in drylands: the first global assessment – Full report. FAO Forestry Paper No. 184. Rome. <https://www.fao.org/3/ca7148en/ca7148en.pdf>



Yet with **regenerative grazing practices and principles, these soil formation and carbon drawdown processes can be rekindled on the planet's remaining rangelands.** Silvopastoral systems are the most common and extended agroforestry systems in the world<sup>4</sup>. Mobile pastoral systems are managed by 100-200 M nomadic or transhumant people<sup>5</sup> globally and are characterized by livestock moving along expertly managed grazing itineraries<sup>6</sup>. They both serve as nature positive and regenerative approaches - integral components of a healthy and functional global climate. **With regenerative grazing management, that is, the right management of livestock and wildlife for the right context, land degradation can be reversed, leading not only to a rapid regain of ecosystem function but to greater revenue for the women, men and youth drawing their livelihoods from these landscapes.**



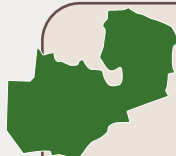
### Grazing with Trees: A silvopastoral strategy for Morocco<sup>8</sup>

The dryland forests and silvopastoral systems in Morocco serve an important role in rural development and the production of goods and ecosystem services. Over time, the customary common resource principles and ancestral practices were undermined, threatening the sustainability of those landscapes. Through multi-stakeholder, cross-sectoral and inter-institutional engagement processes, a strategy based on a common and accepted vision to restore and sustainably manage silvopastoral resources in the long term was developed, implemented through a focus on the governance of all goods and services provided by those landscapes, building on the complementary interventions of the different stakeholders involved.



### Holistic Grazing in Laikipia County, Kenya<sup>7</sup>

A study on regenerative grazing by pastoralists in Laikipia County, Kenya found that with significantly higher numbers of grazing livestock, the number of wildlife more than doubled, average milk yields increased, and animal weight gain nearly doubled compared to traditional grazing areas.



### Farm and Common land Grazing in Zambia<sup>9</sup>

In Zambia, Grassroots Trust works with a rural Chiefdom including 40,000 people on 2000 km<sup>2</sup>. A household working with integrated crop-livestock-tree systems with value addition can increase their income by up to 10-fold over five years. By improving management by putting the animals back together on shared commons, these ecosystems can be restored and become far more productive, with better-quality grazing and increased biomass, more water infiltration, and a return of wildlife. These improved grazing systems bring supplemental income from livestock, forest products, fish and wildlife and can increase income by 4 times.

<sup>4</sup> ILRI, IUCN, FAO, WWF, UNEP and ILC. 2021. Rangelands Atlas. Nairobi Kenya: ILRI [https://www.rangelandsdata.org/atlas/sites/default/files/2021-06/Rangelands\\_web%20%28144%20dpi%29.pdf](https://www.rangelandsdata.org/atlas/sites/default/files/2021-06/Rangelands_web%20%28144%20dpi%29.pdf)

<sup>5</sup> Davies, J and R. Hatfield. 2007. The Economics of Mobile Pastoralism: A Global Summary. *Nomadic peoples*, V. 11:91-16. <https://www.jstor.org/stable/43123794>

<sup>6</sup> Game Changer Solution on Mobile Pastoralism - IYRP. UNFSS, Track 3. 2021. <https://iyrp.info/un-food-systems-summit-unfss>

<sup>7</sup> Lalampaa et al. 2016. Effects of holistic grazing management on milk production, weight gain, and visitation to grazing areas by livestock and wildlife in Laikipia County, Kenya *Ecological Processes* (2016) 5:17 DOI 10.1186/s13717-016-0061-5. <https://ecologicalprocesses.springeropen.com/counter/pdf/10.1186/s13717-016-0061-5.pdf>

<sup>8</sup> FAO. 2022. Grazing with trees: a silvopastoral approach to managing and restoring trees. FAO Forestry Paper No. 187. Rome. <https://www.fao.org/documents/card/en/c/cc2280en> and <http://www.eauxetforets.gov.ma/Pages/Publications.aspx>

<sup>9</sup> Grassroots Trust Zambia. <https://www.youtube.com/channel/UCpl6ED1iFwp8XX68L9To0JQ/>

## IT'S NOT THE COW, IT'S THE HOW<sup>10</sup>

**The right management of grasslands and silvopastures boosts ecological health. The wrong management rapidly degrades it. In both cases, cows are the main agents.**

Over thousands of years, nomadic livestock systems emerged in many parts of the world as a means of coping with seasonal rainfall patterns and fluctuating productivity. Such strategies not only reduced overgrazing and degradation, but also allowed for coexistence with wild herbivores<sup>11</sup>. **Recent research has confirmed what pastoralists have known for millennia: livestock should be bunched into tight herds and moved constantly to allow palatable plants to recover between grazing events, their manure to benefit beneficial plants rather than noxious weeds, and to suppress vector-borne diseases to die out.** This management style, following rich grazing across the seasons, recreates the huge wildlife migrations that dominated our planet before the anthropocene.

**Regenerative grazing replicates this co-evolution at a smaller scale, using adaptive management to optimise grazing exploitation and sward regrowth.**

**This brings multiple benefits:**

### **Effective nutrient cycles**

The planned, periodic and non-selective removal of accumulated grasses by bunched herds allows weeds to be trampled into mulch and new palatable growth to flourish, while their digestive system facilitates the decay of tough fibrous matter, the deposition of rich plant nutrients through manure, and the inoculation of the **soil microbiome with essential bacteria and fungi**. Planned grazing plants and land to recover between grazing events, embraces all complexity, and maximises ecosystem health.

### **Managing for healthy soils means more water**

**Each 1% increase in soil organic matter (SOM) stores an additional 182,000 liters of rainwater per hectare<sup>12</sup>, providing superior buffering for the increasingly erratic rainfall the climate crisis brings.** Research shows grasslands with trees can create an optimal environment for aquifer recharge<sup>13</sup>, able to repair degraded watersheds at scale and replenish dried-up rivers.

<sup>10</sup> <https://forceofnature.com/blogs/regenerate/june-grazing-by-diana-rogers>

<sup>11</sup> Niamir-Fuller, M. et al. 2012. Co-existence of wildlife and pastoralism on extensive rangelands: competition or compatibility?. Pastoralism: Research, Policy and Practice volume 2, Article number: 8 (2012); <https://pastoralismjournal.springeropen.com/articles/10.1186/2041-7136-2-8>

<sup>12</sup> <https://www.nrdc.org/experts/lara-bryant/organic-matter-can-improve-your-soils-water-holding-capacity>

<sup>13</sup> Ilstedt, U., Bargués Tobella, A., Bazié, H. et al. Intermediate tree cover can maximize groundwater recharge in the seasonally dry tropics. Sci Rep 6, 21930 (2016). <https://doi.org/10.1038/srep21930>



## Enhancing biological diversity

**Rangelands harbour 35% of global biodiversity hotspots and provide habitat for 28% of all threatened species<sup>14</sup>.** The older paradigm of conservation based on protecting land and biodiversity by fencing is more and more being replaced with community-based governance and landscape management.

Conservation organisations such as the National Audubon Society, Conservation International and The Nature Conservancy are increasingly supporting regenerative grazing to improve wildlife habitats. Approaches such as participatory rangeland management assist communities to improve their management and governance structures to better manage their land in the face of new challenges<sup>15</sup>. Savory Institute's global network<sup>16</sup> supports land stewards with knowledge and tools to promote the health of the grasslands, domestic livestock, and **increased species of wildlife and diverse grass, shrub and tree species.**

Mobile pastoral systems are critical for seed dispersal for a range of diverse species, as well as biodiversity structuring. Results suggest that regenerative grazing combines the economic benefits of livestock grazing with increasing wildlife, grass, shrub and tree diversity, all based on enhanced land health and the greater availability of water.

## Sequestering carbon

An accumulating body of recent research suggests that the carbon sequestered in soils through nature-inspired grazing more than offsets all greenhouse gas emissions associated with the production of beef. Studies in North America indicate that holistic planned grazing can lead to sequestration rates of 2 to 3,7 tonnes C ha<sup>-1</sup> yr<sup>-1</sup>, or an average sequestration of 10 tonnes CO<sub>2</sub> ha<sup>-1</sup> yr<sup>-1</sup><sup>17</sup>. Research in Latin America shows that the implementation of improved forages has promoted soil carbon accumulation of 2.0 t C ha<sup>-1</sup> yr<sup>-1</sup> (0–20 cm) and reduced N<sub>2</sub>O emissions from animal urine up to 10 times compared to degraded grasslands<sup>18</sup>. Well-managed rangelands could sequester 35% of terrestrial carbon<sup>19</sup>.

<sup>14</sup> M.Niamir-Fuller, 2022. Sustainable pastoralism: a nature-based solution proven over millennia. Crossroads Blog. <https://www.iucn.org/crossroads-blog/202206/sustainable-pastoralism-nature-based-solution-proven-over-millennia>

<sup>15</sup> Flintan et al 2019. <https://cgspace.cgiar.org/handle/10568/106017>

<sup>16</sup> <https://savory.global/our-network/>

<sup>17</sup> Soil4Climate. 2022. Per Hectare and Acre Soil Carbon Drawdown Measures Through Holistic Planned Grazing and Globally by All Means: A Technical Brief <https://docs.google.com/document/d/1WMBvBvP9-IAKEikFBTbHiA8ly83bM7mBkzZmH4z4RO8/edit>

<sup>18</sup> Costa C Jr, Villegas DM, Bastidas M, Matiz-Rubio N, Rao I and Arango J (2022) Soil carbon stocks and nitrous oxide emissions of pasture systems in Orinoquía region of Colombia: Potential for developing land-based greenhouse gas removal projects. *Front. Clim.* 4:916068. doi: 10.3389/fclim.2022.916068

<sup>19</sup> M.Niamir-Fuller, 2022. Sustainable pastoralism: a nature based solution proven over millennia. Crossroads Blog. <https://www.iucn.org/crossroads-blog/202206/sustainable-pastoralism-nature-based-solution-proven-over-millennia>



## Grazing livestock and grazing with trees provide a wide range of ecosystem services

Cows, sheep, goats, camels, and other grazing livestock, managed regeneratively, are vital for achieving a secure, resilient supply of food and fibre (for clothing, shelter, and fuel). They provide economic and livelihood security for women, men and youth, aid in achieving financial prosperity, and restore landscapes which can support synergies among different land users.

## In rangelands, “think right tree in the right place at the right time”

While trees in drylands, forests, savanna and other grassy woodlands provide essential ecosystem services including feed, timber, nuts and fruits, shade, pest control and the regulation of nutrient and water cycles<sup>20</sup>, **this does not mean that the indiscriminate planting of trees in rangelands to meet climate mitigation goals is a good idea:** “commercial tree plantations in particular sequester far less carbon than native forests and hold little more carbon, on average, than the land cleared to plant them. When plantations replace rangelands, they decrease biodiversity (fauna and flora), streamflow and albedo, and increase wildfire risk, while adversely affecting the livelihoods of people depending on livestock and wildlife.”<sup>21</sup>

<sup>20</sup> FAO. 2022. Grazing with trees – a silvopastoral approach to managing and restoring trees. FAO Forestry Paper, No. 187. Rome. <https://doi.org/10.4060/cc2280en>

<sup>21</sup> IYRPIInternational Support Group, 2022. “Rangeland Afforestation is not a Viable Climate Change Mitigation Strategy”, Policy Note. <https://iyrp.info/integrity-council-voluntary-carbon-market-icvcm>



# WHAT NEEDS TO CHANGE?

The policy environment that enables management of rangelands including silvopastoral systems needs to recognise the ecosystemic processes that lead to greater resilience, accelerated carbon drawdown, and soil, land and biodiversity restoration.

Policymakers must encourage the widespread application of regenerative grazing principles by livestock producers and conservation officials.

## These include:

- **Shift to holistic, systemic, contextual, and grassroots-supported planning and management approaches** by all relevant stakeholders that link food security, livelihoods and market benefits to rising health and resilience in ecosystem function.
- Encourage **cross-sectoral and multi-stakeholder approaches** including those that engage men and women together as agents of change<sup>22</sup> to develop and implement grazing land restoration and drought strategies at local, regional, national and continental scale.
- **Recognise rangelands and the people who manage them** for their uniqueness and potential to address climate change and restoration<sup>23</sup>. **Reframe decision-making** from one focused on win/lose tradeoffs to synergies that deliberately take into account silvopastoral/rangeland functions and their services and benefits.
- **Promote the effective integration of pastoralist itineraries and infrastructures in the sustainable development strategies**<sup>24</sup> to enhance the synergies with local economy and other production systems including crops, orchards, timber plantations, and silvopastoral systems. There is a greater need for tenure security for pastoralists and their lands providing greater incentive for investment in management practices.
- **Recognise that different management solutions are needed depending on the status of land tenure.** Pastoral systems based on mobility and

common property management benefit from supportive policies such as security and recognition of transhumance routes, veterinary and education services geared to mobile and multi-species herds, and lifting of market barriers for small-holder animal products.

- **Integrate an understanding of regenerative rangeland management into planning, education, health and security policies** - for example, facilitate pastoral grazing by providing mobile education services to pastoralists' children ("a teacher on a camel").
- **Educate, grow and deploy grassland management advisors** to support the co-design of context specific grazing strategies with local people implementing and linking efforts and learning at wider scales.
- Systematically **apply true cost accounting to livestock products worldwide**, thus ensuring balanced and equitable trade in livestock products, both domestically and internationally.
- **Monitor change over time** using multi-indicator tools such as Ecological Outcome Verification<sup>25</sup>, the Land Degradation Surveillance Framework<sup>26</sup>, among others.
- Build **effective grazing management approaches into national Long Term Low Emission Development Strategies (LT-EDS)** and the **Nationally Determined Contributions (NDCs)**.
- To support and buttress all of this, an **effective, ambitious, and professional policy advice and communication effort** is needed across the world's rangelands building upon a grassroots movement of success.

During the first "Africa COP" of the UNFCCC, we are bound by the increasingly urgent commitments made since COP15 and the Paris Agreement through COP26 in Glasgow in 2021, as well as the UN Food Systems Summit (2021) and the UNCCD COP15 declaration (2022). The critical nature of grazing lands in meeting these commitments is also echoed in the UN Decade on Ecosystem Restoration, the EverGreening the Earth Campaign and the efforts associated with the upcoming International Year of Rangelands and Pastoralists (IYRP 2026).

<sup>22</sup> <https://gender.cgiar.org/tools-methods-manuals/gender-transformative-approaches-overcome-constraining-gender-norms>

<sup>23</sup> Magero, C., J. Davies and R. Ouedraogo. Pastoralism and the Restoration Agenda Blog | 14 Mar, 2019. <https://www.iucn.org/news/ecosystem-management/201903/pastoralism-and-resoration-agenda-0>

<sup>24</sup> Game Changer Solution on Mobile Pastoralism - IYRP. UNFSS, Track 3. 2021. <https://iyrp.info/un-food-systems-summit-unfss>

<sup>25</sup> <https://savory.global/land-to-market/eov/>

<sup>26</sup> Land Degradation Surveillance Framework <http://landscapeportal.org/blog/2015/03/25/the-land-degradation-surveillance-frameworkldsf/>



## Acknowledgements

Contributors (alphabetical order): Ciniro Costa Junior (Alliance of Bioversity International and CIAT), Arthur Getz Escudero (Urban PlanEat), Fiona Flintan (ILRI), Dennis Garrity (Global Evergreening Alliance), Bobby Gill (Savory Institute), Fidaa Haddad (FAO), Daniela Ibarra Howell (Savory Institute), Seth Itzkan (Soil4Climate), Mounir Louhaichi (ICARDA), Chris Magero (IUCN), Eleanor Milne (CSU), Constance Neely (CIFOR-ICRAF), Maryam Niamir-Fuller (Author: Managing Mobility), Judith D. Schwartz (Author: Cows Save the Planet), Nick Sharpe (Savory Institute), Rolf Shenton (Grassroots Trust), Karl Thidemann (Soil4Climate), and Patrick Worms (CIFOR-ICRAF)

This document has been developed by colleagues from a range of institutions who are interacting with the Global Evergreening Alliance, Evergreening the Earth Campaign ([evergreening.org](http://evergreening.org)), Target 6 on grazing lands and silvopastoralism systems. The Target Action Group has identified a global rangelands restoration target to regenerate a healthy grass-tree balance on 650 m ha of degraded pasturelands with an annual sequestration drawdown target of 3.6 Gt CO<sub>2</sub>-eq by 2050 while enhancing ecosystem functions and services and improving livelihoods.

