



United Nations
Convention to Combat
Desertification

Challenges of restoration of grassland and savannah ecosystems

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Grasslands and Savannas - neglected Ecosystems: Time to Act

World Wildlife Fund
15.05 – 16.00 Restoration
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Local challenges



Local changes in livestock utilization, disease, fire management, invasive species, abundance of predators, consumption by people, and habitat loss due to land conversion for agriculture and settlement



Invasive species

- Invasive species can **displace native plants** prior to restoration, and they can outcompete natives during restoration.
- Invasive species can **change the natural disturbance regimes** (such as the intensity, frequency and seasonal time of wildfires), thus resulting in further grassland or ecosystem habitat loss.



Grassland & savanna restoration challenges



Global shifts in climate, human population growth, and the changing structure of socio-economic systems (e.g., globalization, consumption patterns, diet, migration, exurbanization) are changing the structure and function of grassland and savanna ecosystems



Systemic challenges

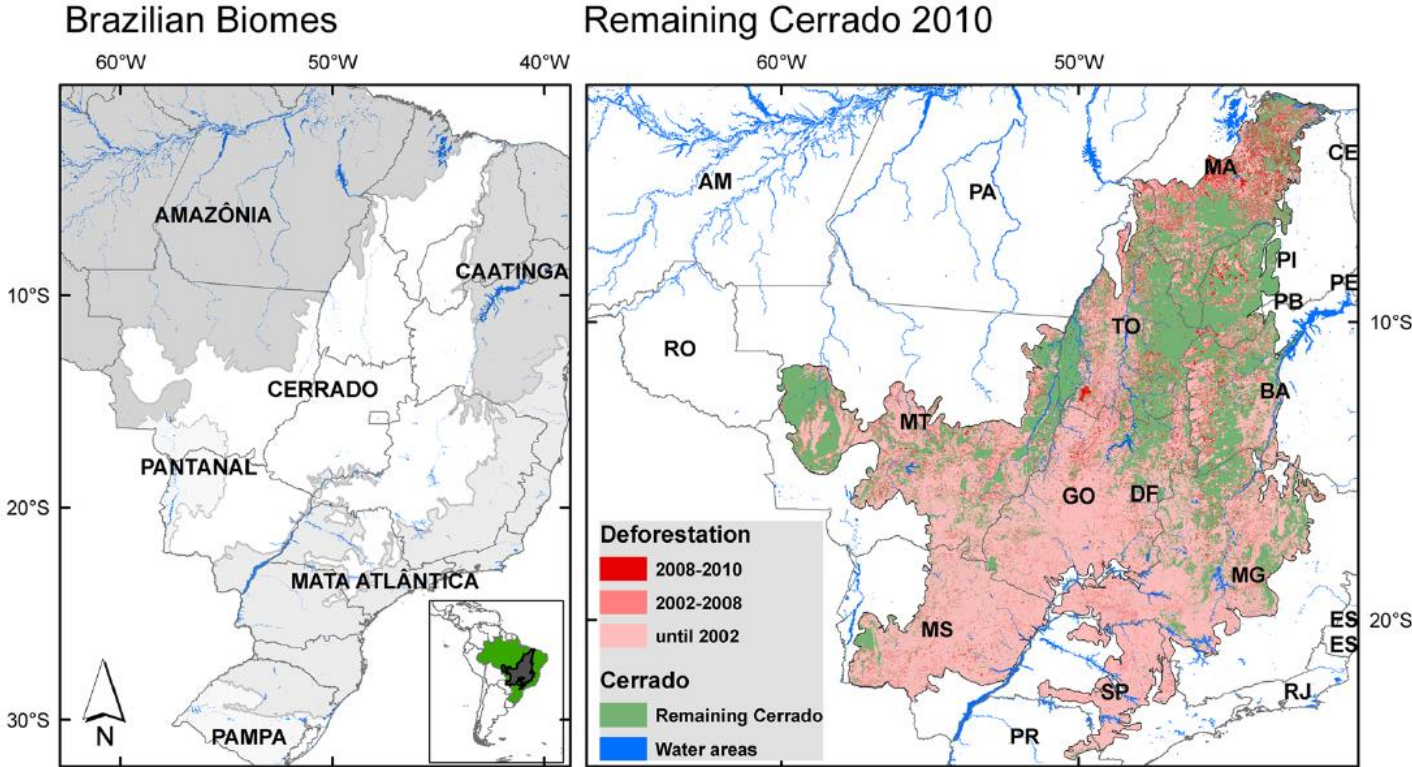
- High levels of poverty, low levels of investment, poorly adapted policies
- Heterogeneous resources and seasonal availability on a vast scale
- Complex governance arrangements, which are weakening
- Increasing exposure to natural hazards due to climate change, biodiversity loss and land degradation
- Data are scarce and adaptations are poorly understood (e.g. herd mobility, fire management, water management, land tenure)



An example: Land use change in the Brazilian savanna



An example: Land use change in the Brazilian savanna



Grechhi et al. 2015. INPE Symposio

Restoration is hard!

- Restoration is important for biodiversity conservation worldwide, but surprisingly little is known about its efficiency in a long-term perspective
- Ecosystem structure can often be restored to some degree, but underlying ecosystem functions and processes take much longer
- Similar story for biodiversity - overall species composition in restored sites can resemble reference conditions
- However, total species richness, while increasing over time, often does not reach reference levels



For a good example, see: Waldén E, Lindborg R (2016)

Image credit: Green Valleys Watershed Association (USA)

Opportunities increase the potential for success



- Ramping up **native seed production**
- Recognizing the importance of **soil legacy, soil biodiversity and soil conditioning**
- Employing methods to **increase invasion resistance** and the **reintroduction of disturbance regimes** (e.g., controlled burning)
- Being open to **interventions designed to increase native perennial grasses over exotic grasses** (e.g., low-cost grazing, herbicide, and seeding treatment)s
- Being open to approaches that **link restoration to sustainable value changes** such as coupling habitat restoration with biofuel production



Opportunities to increase the scale of impact



- **Spatial prioritization** of grassland/savanna restoration and **reintroduction of grazing and fire**
- Finding creative approaches to **increase the spatial scale** at which fire and grazing can be applied to address watershed to **landscape-scale objectives**
- Developing **partnerships** among government agencies, landowners, businesses, and conservation organizations that enhance **cross-jurisdiction restoration and management** in grassland landscapes with an aim for **multiple benefits**

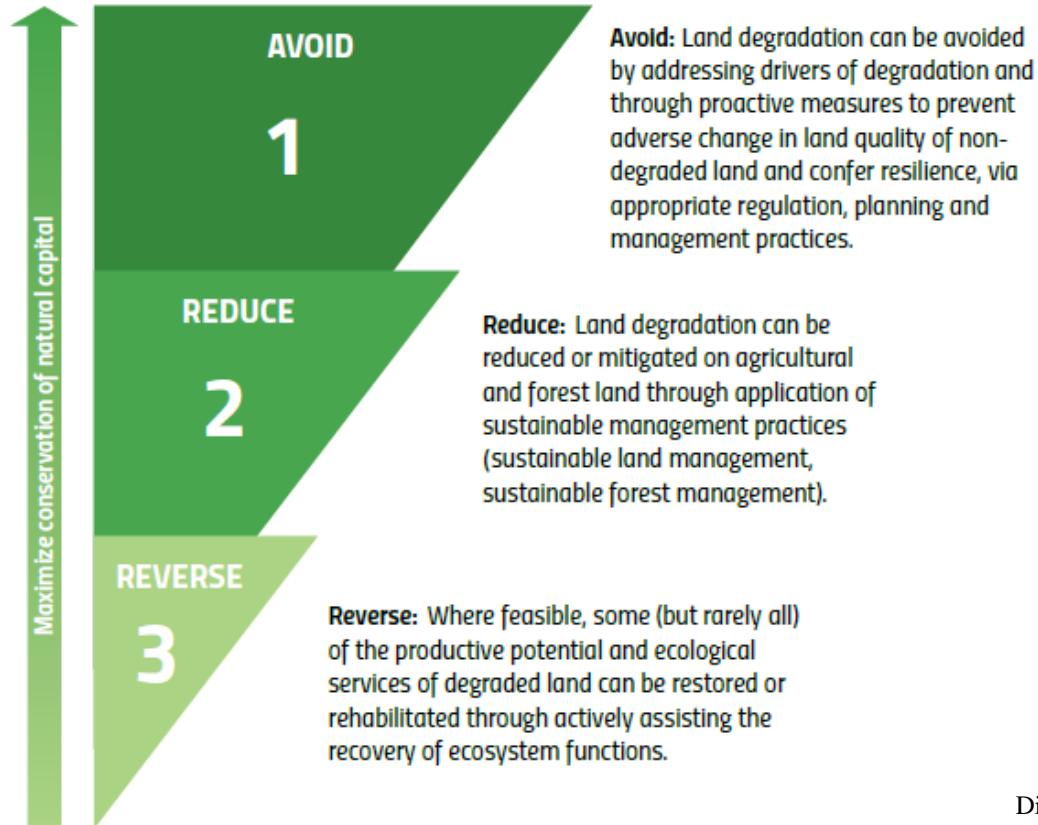


Creating an enabling environment

- Evidence-based and participatory decision making
- Effective institutions for communal resource governance on a large scale
- Active management of livestock herd movements to optimise the relationship between animals and vegetation
- Incentives for both livestock production and environmental stewardship
- Access to markets for diverse goods and services



Prevention is better than the cure



“Saving what remains is far more straightforward, economical, and effective than trying to re-establish what has been lost.”

Packard and Mutel (1997)

Pay attention to the science!



- There is no ``quick fix'' for the establishment of a grassland or savanna
- Ensure that the ideas and approaches being used are based on an **up-to-date understanding of how ecosystems are put together and function**
- Understand that grassland and savannas are **complex dynamic systems** in which **nonlinearity**, historical dependence, and unpredictability are often major features.
- This means **restoring processes** must be considered simultaneously (or even before!) restoring structure.
- **Long-term monitoring** is critical. It provides useful information on the trajectory of community development, allowing for course corrections.
- And before restoring, be sure to address the **drivers of ecosystem degradation**.



Thank you!



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