



Concurrent Panel: Action Plan for the International Year of Rangelands and Pastoralists (IYRP): **The Case for Mexico**

- **Climate Change and Ecosystem Health** -

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Representing Regional Group of North America

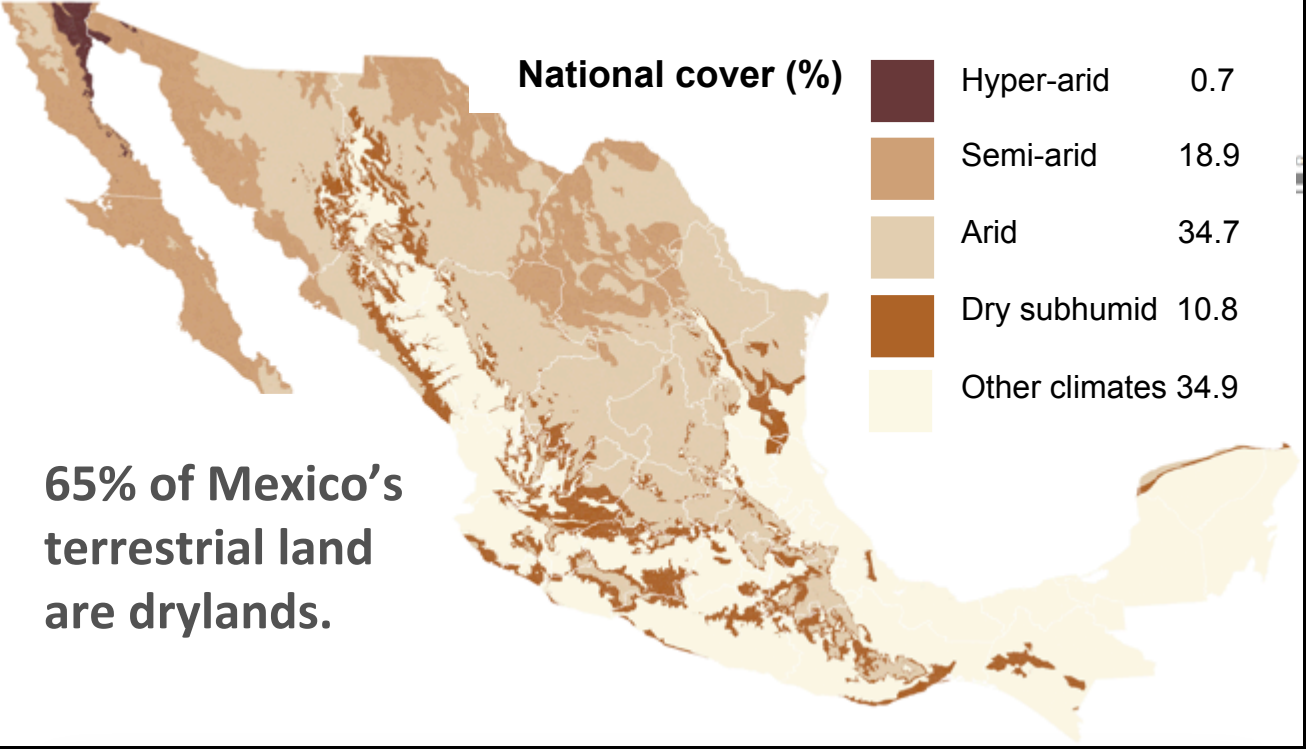
October 26, 2021



Shrublands: 30%



Diverse climatic, edaphic conditions, local wildfires explain the extraordinary biotic diversity of grasslands and shrublands (over 6000 plant species) providing habitat for a wealth of native animals and microorganisms. Besides they are habitat for 50 bird species migrating from N-America.



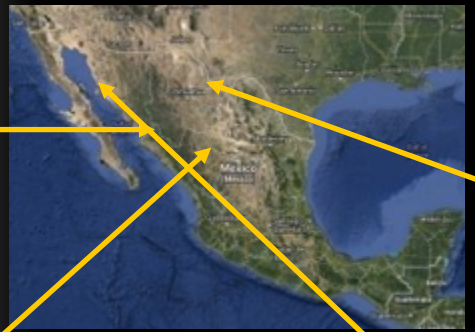
65% of Mexico's terrestrial land are drylands.

Grasslands: 10%



**Linked to this high biotic diversity, Mexican drylands strike for their cultural diversity.
They have coevolved over millennia.**

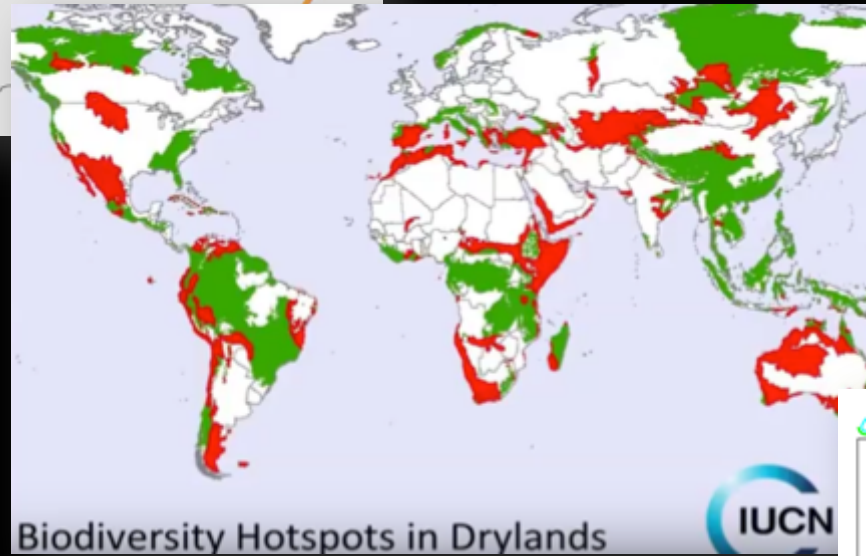
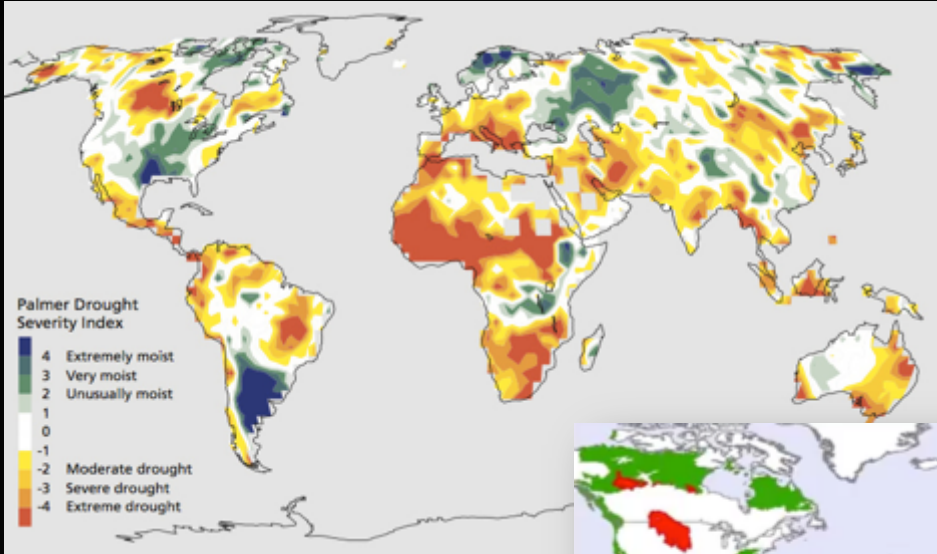
- They are home to a high diversity of ethnic groups.



Contemporary drylands provide livelihoods for a large population of diverse livestock producers forming smallholder pastoralist communities on communal lands (*ejido*), as ranchers (*ganaderos*) on vast depopulated ejido land, or as private ranchers.

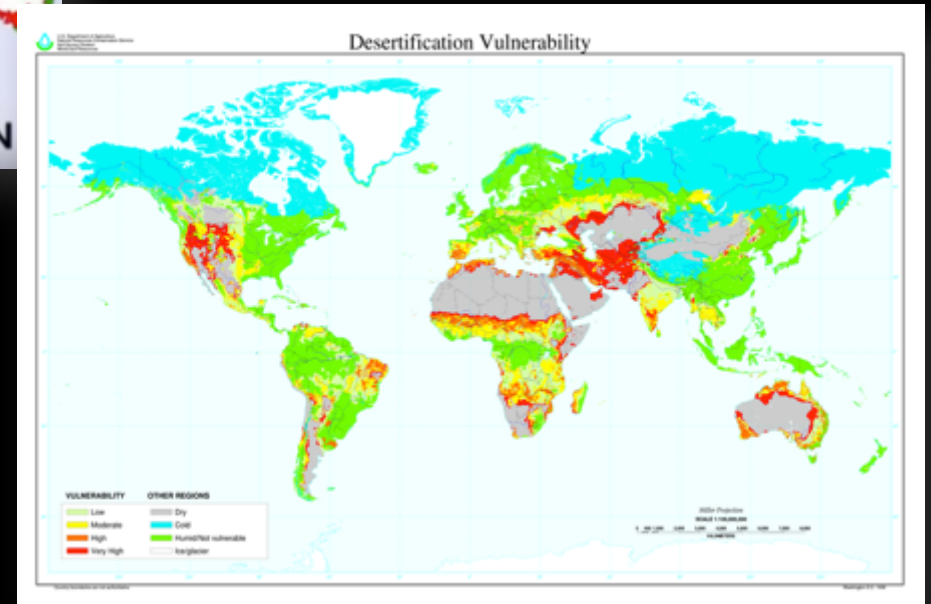


However, Mexican drylands have been affected by severe **droughts** (1900-2002)...

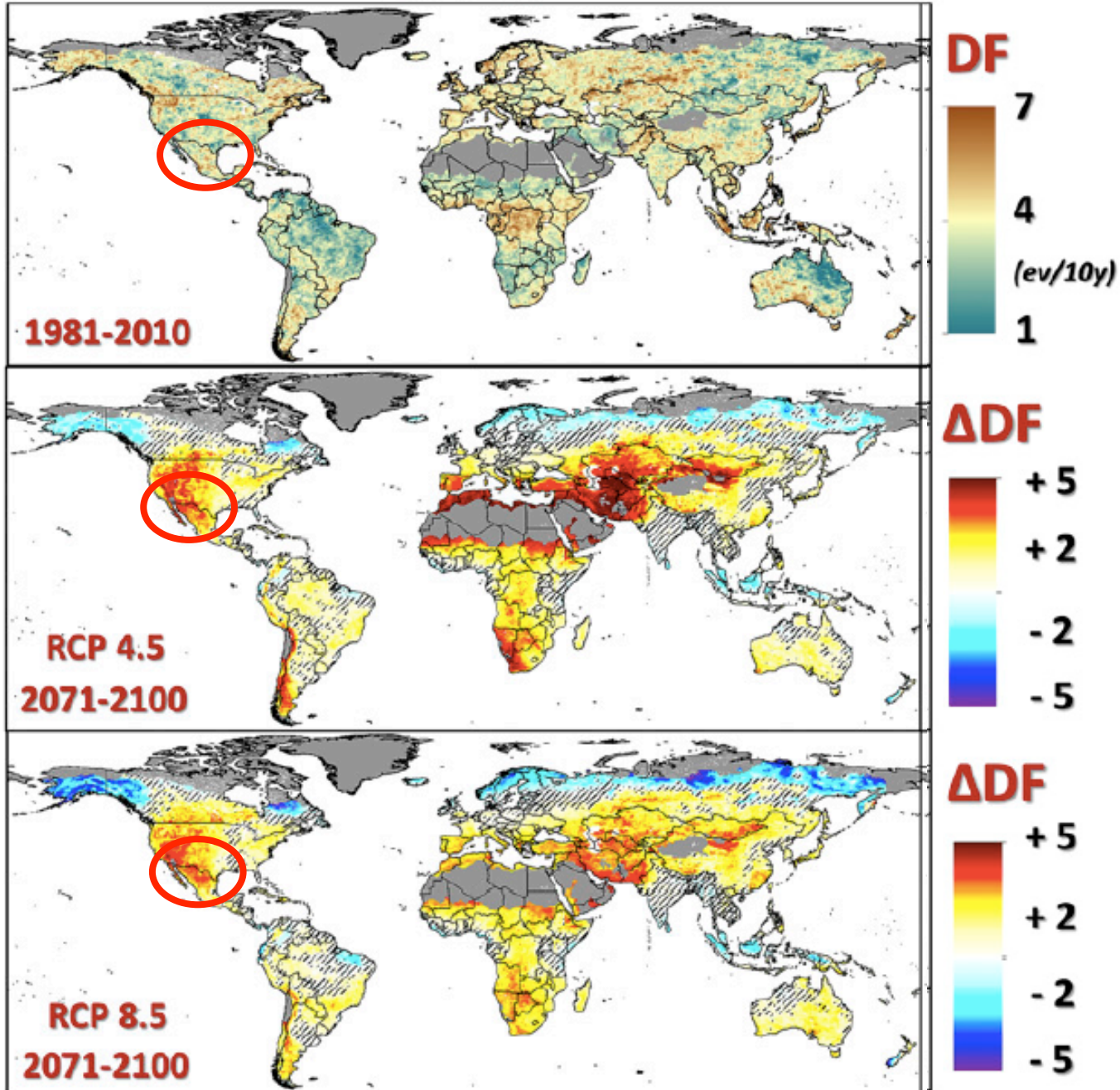


... besides they include many **biodiversity hotspots**...

... and they are highly vulnerable to **desertification**



SPEI-12



Future Rangelands?

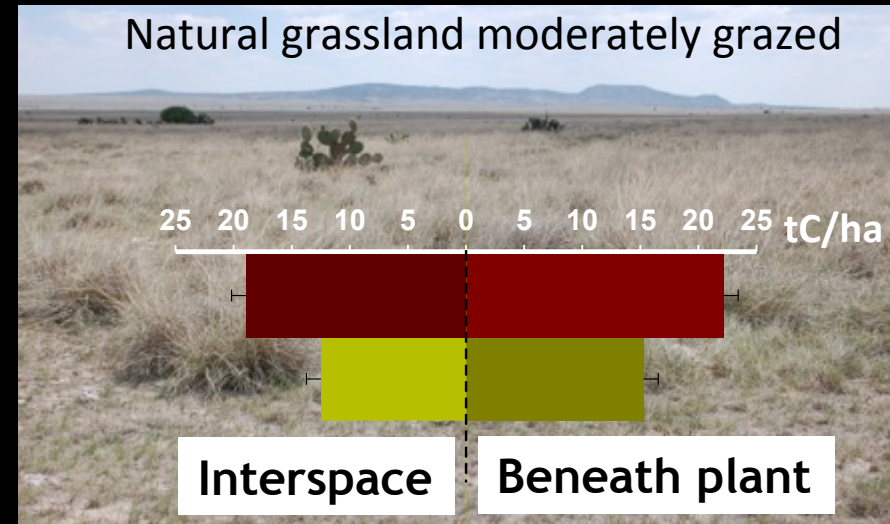
Mexico's rangelands will experience a doubling or tripling in decadal drought frequencies (DF).

Can their pastoralist communities still adapt to these unprecedented changes?

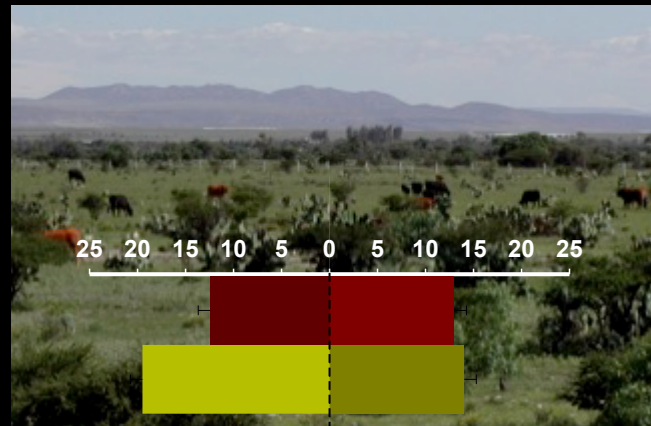
Can Mexico's rangelands keep delivering the life-supporting ecosystem goods and services?

Moderately grazed natural grasslands store unaccounted for soil organic carbon. However, shrub encroachment, the introduction of exotic forage grasses and overgrazing have substantially reduced these important C reservoirs at the biome level and thus curtailed the potential to mitigate climate change at the regional level.

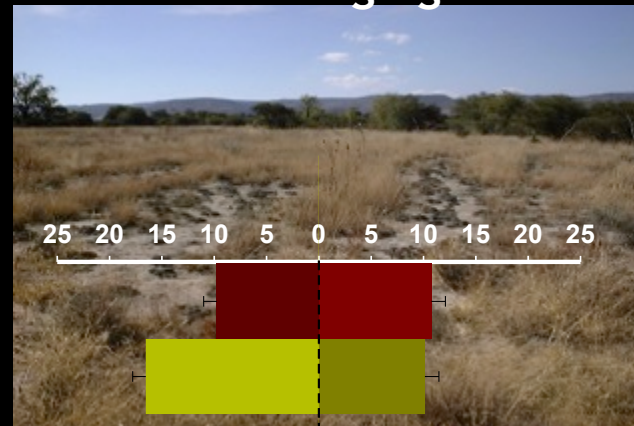
With integrative management practices, accompanied by iterative monitoring programs we need to recover the important rangeland climate change mitigation potential.



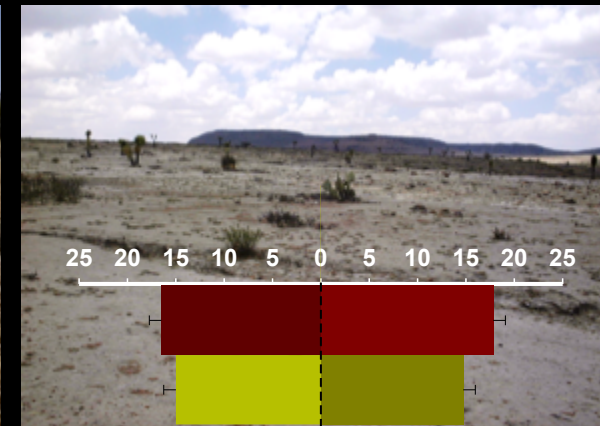
Shrub encroachment



Introduction of exotic forage grasses



Overgrazing



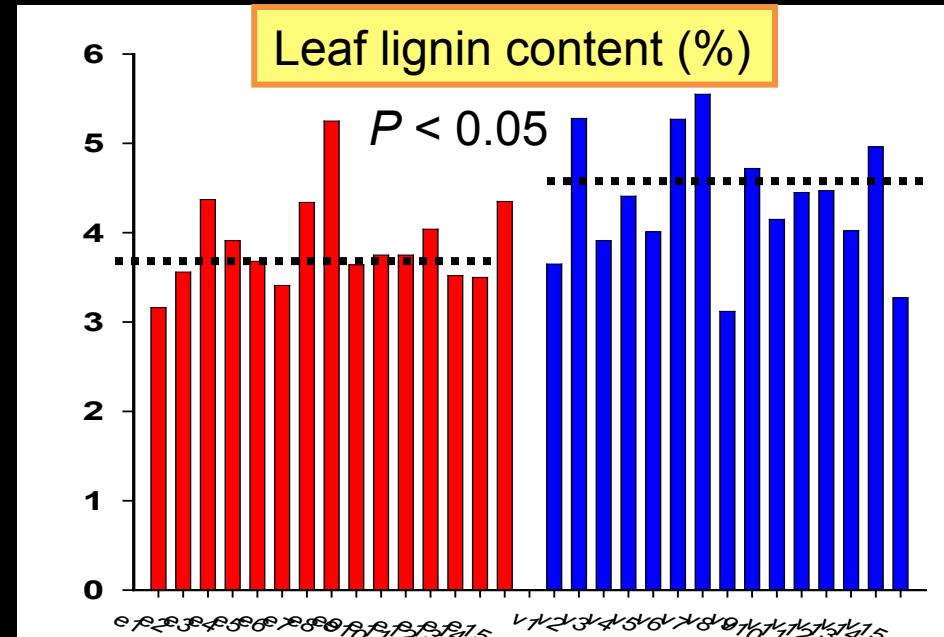
Arredondo and Huber-Sannwald (in preparation)

Bluegrama, *Bouteloua gracilis* is the keystone species of the semiarid grassland biome. It exhibits an extraordinary genetic and functional diversity at the *genotype* level. Recent studies have shown that moderate grazing could maintain high genetic diversity likely including drought resistant genotypes.

New knowledge on the multifunctionality of grassland at the genotype level is urgently needed to improve and restore our rangelands, and thus count on a continuous reliable source of ecosystem services for pastoralist well-being.



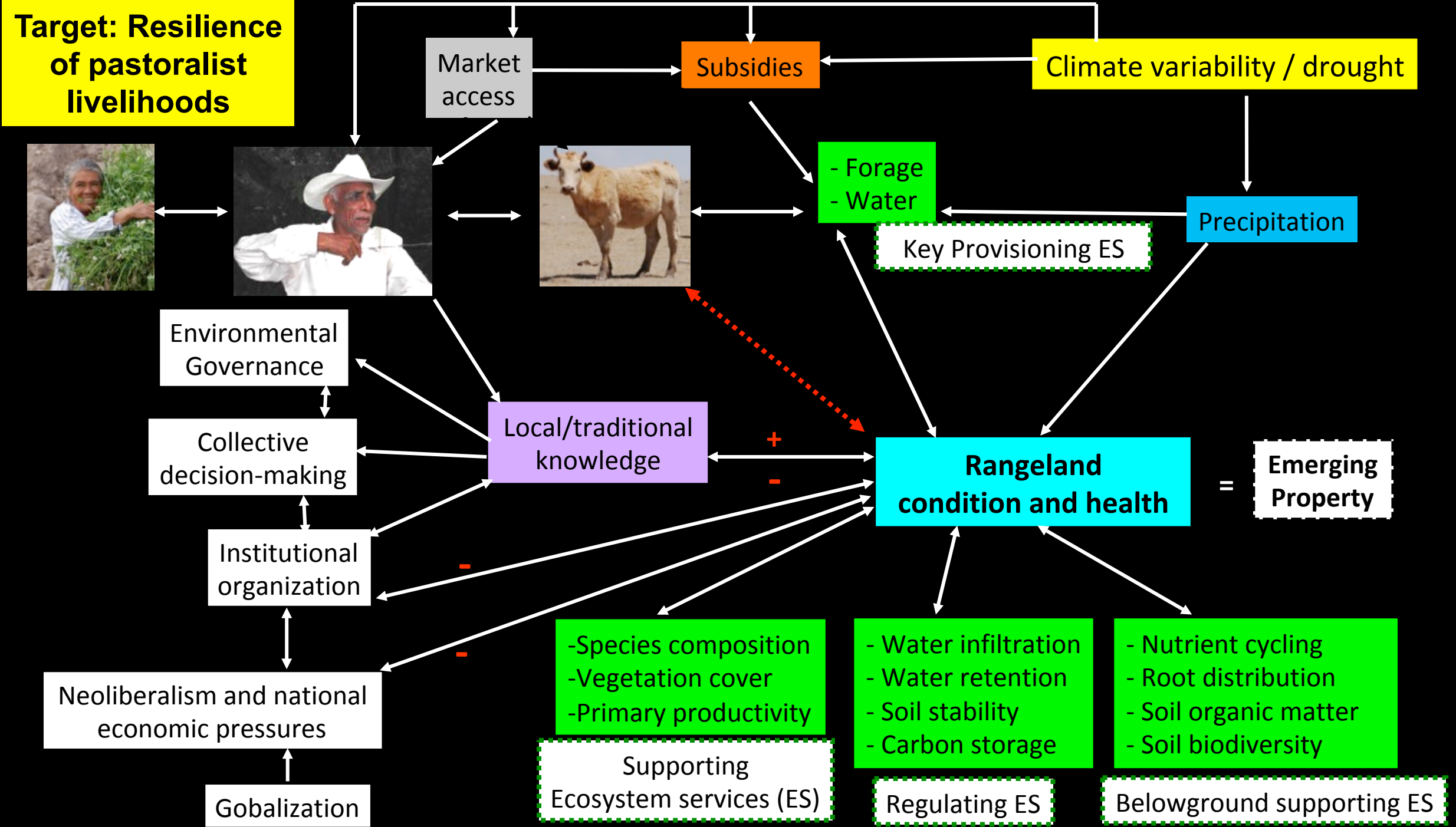
70 years of intensive grazing



Different genotypes of *Bouteloua gracilis*



270 years of moderate grazing



For instance, the privatization of Mexican rangeland communal landscapes has triggered unprecedented transformations that have generated a mosaic of individual units with specific, yet often unrelated objectives, providing likely short-term benefits to pastoralist livelihoods but will inevitably feedback on the integrity of rangeland ecosystem services on the long-term.



It is essential to align the many biophysical and socioeconomic sources of rangeland heterogeneity with the multiple functions of these landscapes. **Transdisciplinary, innovative participatory research approaches are needed, so we can transition to a long-term research – policy – practice nexus for sustainable land planning and the conservation of traditional pastoralist livelihoods.**

Change in land tenure

National soil conservation programs



Rural economy

Subsidy programs

- **Emerging issues:
alternative energy**

Social (re-)organization of farmers

For the IYRP 2026

- We need an agenda for **participatory research, collective action and a socio-ecological system's approach** with the goal of sustaining diverse cultures and just futures for pastoralist livelihoods which depend on the health of Mexico's rangelands.
- This agenda is intended for **multistakeholder partnerships**.
- This agenda needs to be developed out of continuous **transdisciplinary dialogue** and be based on **intercultural competencies**.
- We propose narrative analysis to identify the deep **values, histories, knowledge systems, and worldviews** that shape how human–nature relationships are perceived and to get insight into how rangeland research and action could become more diverse, effective, and just.