

Natural grasslands

Sustainable Agriculture Milestones in the Americas
Successful experiences in the region to address climate change and care for the environment and natural resources



Conservation of natural grasslands in Latin America: a pillar for sustainable livestock production and ecosystem conservation

Livestock producers in some countries in the Americas are practicing a significant amount of natural grassland management, which is making a substantial contribution, by helping to preserve vast ecosystems that are home to extensive biodiversity and by mitigating climate change. This has allowed the region to engage in sustainable livestock production.

Not only do grasslands provide several environmental services, most notably carbon sequestration and the production of forage for wild animals, but they are also the basis for the grazing systems of various countries in the hemisphere, enabling efficient production of meat, milk, and wool for domestic and global use.

Approximately 40% of the world's land surface is covered by natural grasslands, which recent research has shown are currently threatened by changes in soil use and the effects of climate change¹.

Nonetheless, despite the environmental and economic importance of grasslands, many people living in the city are unfamiliar with them and are unaware of their value. These assets remain practically invisible to societies, which tend to be more aware of the ecological and economic value of forests. Therefore, the work of agricultural research centers in Latin American countries has been decisive in developing the ecological and technological bases to improve grassland conservation.

Grasslands are not simply land areas without trees, as some may believe. They are ecosystems that produce rich vegetation that is consumed and transformed by wild and domestic animals, which then yields enormous benefits for people and the planet.

One of the most valuable examples of this ecosystem in the world is the area known as the Rio de la Plata Grasslands, which covers 750,000 km²



¹ Gibson, DJ. 2009. Grasses and Grassland Ecology. Oxford, United Kingdom, Oxford University Press. p. 313.

and spans three countries: more than 7% of the land area of Uruguay; central and northeastern Argentina; and the southern state of Rio Grande do Sul, Brazil. This is one of the most extensive grassland ecosystems on the planet, although it is far from being the only one in the Americas, given that countries such as Venezuela, Colombia, Mexico, the United States and Canada also possess vast grasslands with grasses that are rich in biodiversity.

Grasslands cover more than 900 million hectares throughout the hemisphere, with most of them used for grazing in North and South America, and to a lesser extent, Central America and the Caribbean.

Although European colonization transformed the grasslands of the hemisphere into one of the world's most important agricultural production

regions, the many years of production activity have significantly changed the landscape and resulted in the loss of habitats. However, in recent years, there has been gradual recovery thanks to the work of research centers, which have been at the cutting edge of agricultural modernization.

There are some sustainable practices that have been implemented in the hemisphere and still have the potential to grow, including the preservation of iconic sites that are in danger of extinction; grazing management; production of organic amendments (manure, agroindustrial waste and biocarbon) and cover crops; fertility management; integrated agricultural systems (agroforestry, silvopastoral systems and crop-livestock-forestry systems); and water management, among others.





The environment and food security

Livestock production is an extremely valuable economic activity for Argentina, Brazil, Uruguay, Paraguay, and other countries in the hemisphere. There is a longstanding tradition of cattle production in the Americas and the beef value chain is one of the most important in the region, in terms of production and exports to the rest of the world. It is essential for food security and has deep cultural roots.

Cattle production systems are central to the economic, social, and environmental sustainability of South American countries, and as mentioned before are essential to global food security, given the Southern Cone's vast capacity to produce and export animal-based proteins that are an essential component for the proper nutrition of the population.

Martín Jaurena, researcher from Uruguay's National Agricultural Research Institute (INIA), points out that grasslands, which in Uruguay are referred to as "campo natural", occupy 64% of the country's land

area and have been the mainstay of one of the country's primary economic activities: livestock farming.

INIA, a government entity that develops projects based on state-of-the-art technology, is contributing to natural grassland enhancement through a series of best practices undertaken in collaboration with the private sector, to improve grassland use and promote increased conservation.

"The practices ensure better farm management and allow us to produce more nutritious grass for the cattle. We in turn take care of these resources so that they can remain in good condition over a longer period", said the INIA researcher.

Jaurena also pointed out that, "In order to improve natural grassland production and conservation, producers must have more grass at their disposal, in other words, they must operate on pastures that produce a lot of fodder, thereby maximizing productivity and sustainability. They must be aware



of the various plant communities in the pastures, which have very diverse characteristics. Sometimes a one-by-one-meter plot may contain more than 50 different species. Likewise, a native ecosystem of South America is very different to a tropical ecosystem. This knowledge will allow the livestock farmer to improve productivity".

In Uruguay, livestock farming is the main activity of family farmers. Official statistics indicate that of the country's 44,000 agricultural establishments, 25,000 are family farms and 20,000 of these small-scale operations are devoted to livestock farming, particularly of cows and sheep.

Most of the grasslands are used for cattle rearing and are a source of food, fiber and fuel, while contributing to climate regulation, pollination, purification and recharging of aquifers, control of invasive species and carbon sequestration.

Moreover, healthy pastures are huge carbon sinks and are therefore a key tool for climate mitigation. The soil is the most important carbon reserve in the biosphere, as it contains three times more carbon than the vegetation and the atmosphere. Proper environmental management enables pastures to operate as net carbon sinks.

Several countries of the Americas—such as Brazil, Canada, Colombia, Chile, El Salvador, Paraguay, Peru, and Uruguay—have made headway in improving soil health, through the "Living Soils of the Americas" initiative. The initiative was launched by the Inter-American Institute for Cooperation on Agriculture (IICA) in 2020, in partnership with the prestigious scientist, Rattan Lal, who is considered the world's leading authority on soil sciences. The project has brought together stakeholders from the public and private sector, universities, as well as international and civil society organizations in the hemisphere, in a common restoration effort aimed at tackling soil degradation, which is threatening to undermine food production.

For example, research undertaken by renowned scientists and coordinated by Professor Lal, within the framework of "Living Soils of the Americas", determined that the adoption of two large-scale sustainable management practices (pasture reclamation and conservation tillage) in the Americas would have a potential soil carbon accumulation of 9.81 Pg of carbon dioxide equivalent over 20 years. Thus, with the full implementation of sustainable management practices promoted throughout the region, the soils of the Americas could reduce total global greenhouse gas emissions generated by agriculture by almost 8%

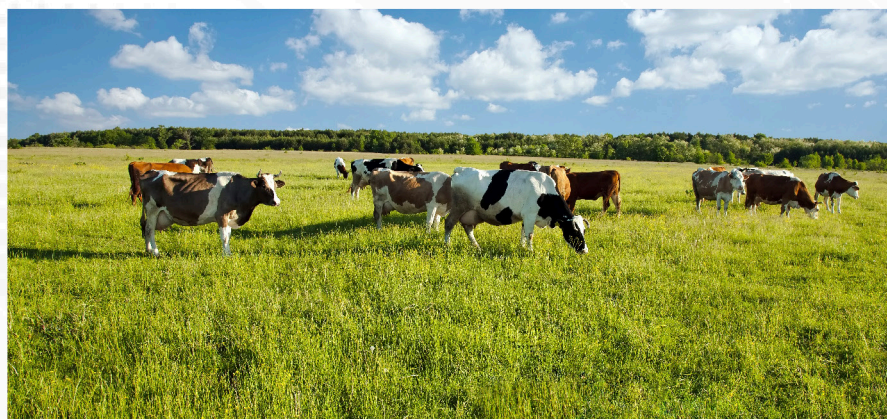




Emphasis on conservation

Although the practice of replacing natural vegetation to feed cattle has been gaining ground in recent years, grassland livestock production comes closest to achieving the desired balance between food production and biodiversity conservation. Thus, livestock production on natural grasslands, as practiced mainly in South America, is an example to the world of sustainable production.

The productivity of ecosystems will increase as more producers use natural pastures. The challenge is to maintain the health of soils and native vegetation. Another benefit is the fact that farmers in the Americas utilize organic rather than chemical fertilizers on most natural grasslands. In all cases, the cattle are also contributing to the fertilization of these grasslands through the biogeochemical cycle



Fewer net GHG emissions

Livestock farming has been identified as an important source of greenhouse gas (GHG) emissions worldwide, thereby contributing to climate change.

However, these emissions are calculated based on international equations that do not necessarily reflect the reality of the Americas, particularly of countries in the Southern Cone, and fail to take into account the heterogeneity of different production systems.

It has already been determined that extensive livestock farming on natural grasslands generates

fewer GHG emissions than intensive production. However, one must also calculate the potential carbon capture and sequestration of the pastoral systems used in the Southern countries.

Although there is a need for more research that accurately reflects the impact of the various systems, there are scientific studies today that indicate that grazing lands in countries in the Southern Cone produce excess carbon. In other words, the carbon sequestration by the grasslands more than compensates for the emissions produced by the animals, under conditions of extensive grazing.

Studies on this issue undertaken by a group of researchers headed by renowned Argentinian scientist, Ernesto Viglizzo, reveal that grazing lands in Argentina, Brazil, Uruguay, and Paraguay play a fundamental role in carbon capture, which offsets methane emissions generated by the cattle.

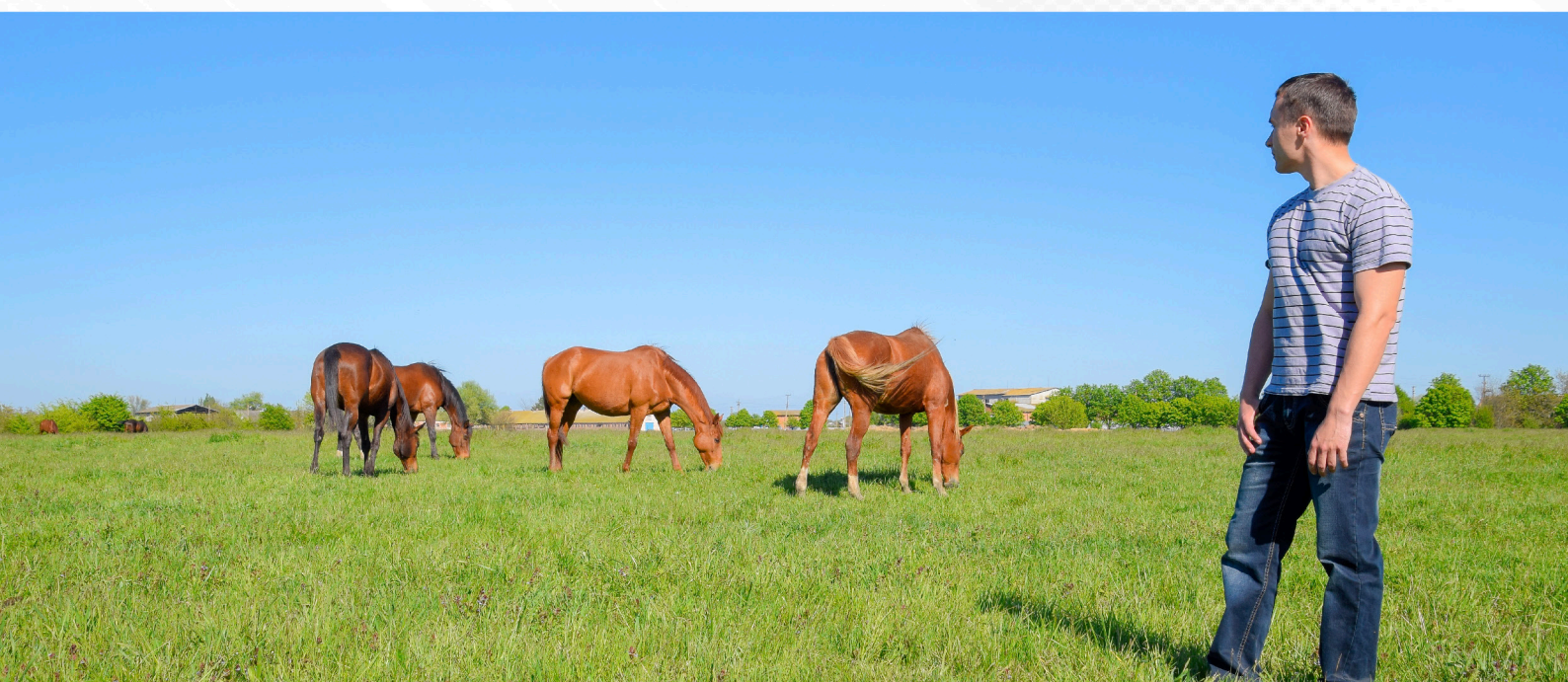
Viglizzo's studies maintain that the sole focus should not be emissions from animal production, but also the net carbon balance, which favorably

impacts the environment, particularly with the practices adopted in the Southern region.

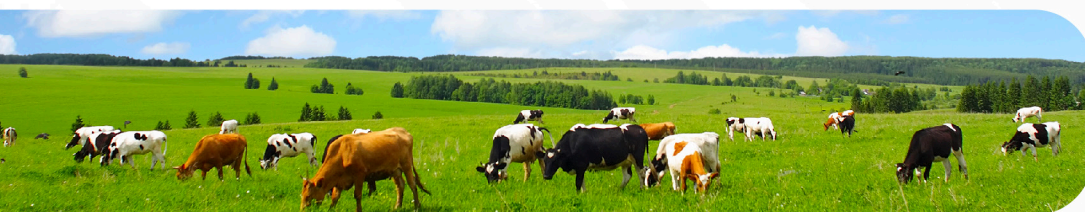
Thus, Latin American countries have made significant headway in reducing the carbon footprint of meat production and they intend to continue on this path, by strengthening initiatives that contribute to the increased adoption of technology and agricultural practices that mitigate GHG emissions.

The benefits of natural grassland conservation in the region can be summarized as follows:

- Natural grasslands offer producers increased resistance and resilience to drought.
- Natural grasslands contribute to national economies, culture, and ecosystem health.
- The ecosystem services approach establishes a more explicit link between human well-being and the functioning of ecosystems.
- Natural grasslands not only generate forage for cattle, but also provide the population with important ecosystem services, such as erosion control, biodiversity, and water quality conservation, as well as climate mitigation, among others.
- Natural grasslands provide the population with much more than meat production services. This ecosystem is important for the sustainable development of the country.



Natural Grasslands



Next steps

Currently, INIA in Uruguay is working on joint projects with researchers in Argentina and Brazil and exchanging best practices to improve natural grasslands. There are also initiatives with professionals in Costa Rica and Colombia, using satellite information to identify the amount of pasture involved in production systems in these countries. Work is also being undertaken with remote sensors that take aerial photographs in the

fields. The results of these projects will facilitate better decision-making about grassland management.

Also underway is the development of mobile apps that can identify the different types of fields in a cattle farm, in order to develop precision practices and optimize production



New challenges

The main challenges in promoting the use of natural grasslands in a bid to address the climate crisis are undoubtedly the need to improve the efficiency of their use and to increase the carbon sequestration of production systems. However, there are other actions that can contribute to climate change mitigation, in particular by:

- Strengthening the connection between grasslands and native forests. Most of these forest areas exist naturally on the farms, but in some cases, there are small, cultivated forests. The aim is to ensure the coexistence of pastures and trees.

- Placing greater emphasis on projects aimed at training and knowledge transfer about natural grasslands in all countries of the region.

The region's large expanse of natural grasslands demonstrates the importance of protecting them to address the climate crisis and protect biodiversity.

“Investing in natural pasture management is a good business venture today, tomorrow and always”, Martín Jaurena, INIA.

“Natural grassland: land area dominated by herbaceous species, many of which are palatable to livestock, and which are considered spontaneous and grow naturally in that area, with no introduced species”, INIA Uruguay.





2022. Inter-American Institute for Cooperation on Agriculture (IICA)

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