منظمة الأغذية والزراعة للأمم المتحدة
联合国粮食及农业组织
Food and Agriculture Organization of the United Nations
Organisation des Nations Unies pour l'alimentation et l'agriculture
Продовольственная и сельскохозяйственная организация Объединенных Наций
Organización de las Naciones Unidas para la Alimentación y la Agricultura

# COMMISSION ON LIVESTOCK DEVELOPMENT FOR LATIN AMERICA AND THE CARIBBEAN

**XVI CODEGALAC**

**Ecuador, 11-13 July 2023**

**REGENERATIVE LIVESTOCK FARMING**

Questions, comments and suggestions regarding the content of this document should be addressed to:
Technical Secretariat of the XVI Session of CODEGALAC
RLC-CODEGALAC-XVI@fao.org

## I. CONTEXT

### I.1. SUMMARY

This document presents the main principles, contributions and challenges of regenerative livestock farming in Latin America and the Caribbean to provide recommendations for the transformation or adaptation of livestock systems towards systems that are tied to biodiversity conservation and human development needs.

Livestock farming for meat and dairy production is essential to the economy in the countries throughout the region, both in terms of exports and its impact on family economics through job creation.

Production across this region consists primarily of pastoral farming—in natural pastures in some areas—with well documented climate change mitigation benefits.

Given the new global climate scenarios, regenerative livestock and planned grazing can contribute to reversing environmental degradation and mitigating climate change. An emphasis on soil health and increased levels of carbon and organic matter have been shown to have a positive feedback loop for environmental health, farmers' economic security and consumers' nutritional health.

Mixed production systems (such as agroforestry, silvopastoralism, etc.), along with good farm management practices, soil management, diversified growing of indigenous or locally adapted species, and intensification of livestock farming, are just some of the regenerative practices widely implemented across LAC.

The most pressing challenges facing regenerative livestock farming in LAC are related to climate-smart livestock farming,[1] the urgency of managing production sustainably without increasing land area, the promotion of integral landscapes especially on a large scale, monitoring systems and technology transfers, and incentives and certifications. The CODEGALAC Technical Secretariat has introduced some recommendations to tackle these challenges.

Lastly, it bears mentioning that regenerative livestock farming contributes to the fulfilment of international frameworks governing sustainable production such as the Sustainable Development Goals, the international One Health initiative, the FAO strategic framework for 2022-2031, and the new international guidelines on deforestation-free production.

## I.2. INTRODUCTION

According to the Food and Agriculture Organization of the United Nations (FAO), regenerative livestock production is based on the use of ecosystem services and natural processes, which optimises the use of local renewable resources while minimising negative externalities (FAO, 2019).[2] This implies using principles related to sound soil and herd management, human and ecosystem health, and resilient food systems.[3]

Livestock systems are essential to the economy of the Latin America and the Caribbean (LAC) region, which is home to 13.5% of the world's population, contains 28% of the world's livestock herd,[4] and accounts for 23% of the world's beef supply and 11.8% of dairy production.[5]

Although livestock exports are mainly concentrated in countries such as Brazil, Argentina, Mexico, Colombia and Paraguay, livestock production remains a common and strategic activity throughout the entire region due to its considerable impact on family economics. Moreover, through associativism or cooperatives (for example, the *Dos Pinos* dairy farmer cooperative in Costa Rica), livestock farming has become an important source of employment during the early stages of cattle rearing and dairy production and marketing.

[1] La ganadería climáticamente-inteligente busca incrementar sosteniblemente la productividad e ingresos de la ganadería, mejorar la resiliencia de los sistemas ganaderos al cambio climático y reducir las emisiones de gases de efecto invernadero. En FAO, 2012. Ganadería climáticamente inteligente en Ecuador: una colaboración estratégica entre la empresa privada y la FAO. Disponible en: https://www.fao.org/documents/card/es/c/CA9462ES

[2] Available at: https://www.fao.org/faoterm/es/

[3] Spratt, E. et al. Accelerating regenerative grazing to tackle farm, environmental, and societal challenges in the upper Midwest. Journal Of Soil And Water Conservation, [S.L.], v. 76, n. 1, p. 15-23, 2021. Soil and Water Conservation Society. http://dx.doi.org/10.2489/jswc.2021.1209a.

[4] Congio, G. F. S; Bannink, A.; Mogollón, O. L. M. Enteric methane mitigation strategies for ruminant livestock systems in the Latin America and Caribbean region: A meta-analysis. Journal of Cleaner Production, v. 312, Aug. 2021. Doi: https://doi.org/10.1016/j.jclepro.2021.127693

[5] FAOSTAT. Livestock Patterns: database, 2021. Available at: https://www.fao.org/faostat/en/#data/EK.

In LAC, livestock farming is also known for employing young and adult women,[6] who make up 70% of the sector workforce.[7] The Ecuadorian Andes region is a noteworthy example, where 23% to 47% of all livestock farms are run by women.[8] The situation is similar in Uruguay and Argentina.[9]

Livestock production in LAC is essentially pastoral,[10] with no more than 34% of livestock confined (contrary to the US and Europe where 70% and 65% of livestock is confined, respectively). Some of this activity takes place in areas with natural pastures, where the biological balance and provision of ecosystem services is reliant on grazing by large herbivorous animals,[11] which leads to significant opportunities for conservation and sustainable production in areas marked by a long-standing tradition of livestock grazing. The South American Pampas, the Mesopotamian Savannah in Argentina, the *Campos Sulinos* or Pampa and the Pantanal in Brazil are the most noteworthy examples of pastoral ecosystems.

Regenerative livestock production on natural grasslands has at least three advantages:

1) Ruminant animals (as opposed to monogastric animals) have a greater capacity to convert biomass that cannot be ingested by humans into high-value protein and calories for humans.
2) Ruminant animals require four times less productive area per unit of protein than monogastric animals.[12]
3) Natural grasslands would provide hardly any ecosystem services if they were no longer used for livestock farming.[13]

Despite these advantages, livestock development in LAC has historically been characterized by its impact on environmental systems, which is linked to low productivity and to leading to socio-environmental conflicts. Furthermore, the region's greenhouse gas (GHG) emissions from the livestock sector have historically been the highest in the world (1.9 GtCO2 emitted annually) and this is mainly due to changes in land use, associated with deforestation and the expansion of pastures.[14]

In view of this, and the new climate, economic and social scenarios, it is more urgent today than ever to accelerate the transformation of production systems towards evidence-based models that are more sustainable and healthier and that integrate the nature-based solutions approach with the relationship between human beings and the environment.

In this regard, livestock and regenerative grazing, as well as agroforestry and silvopastoralism are positioned as a key opportunity to achieve sustainable and accessible agricultural production for the region's producers, thus strengthening their livelihoods.

Through practices that combine traditional knowledge with new knowledge and technological advances in herd management, regenerative livestock farming improves farm profitability, human and ecosystem health, and the resilience of food systems. The international initiative *Alianza del Pastizal en*

[6] FAO. World Livestock: transforming the livestock sector through the sustainable development goals. Rome: 2018. 222 p. Available at: https://www.fao.org/3/CA1201EN/ca1201en.pdf.
[7] FAO. Decent Rural Employment: livestock. Livestock. Available at: https://www.fao.org/rural-employment/agricultural-sub-sectors/livestock/ru/
[8] Torres, B. et al. Livelihood Capitals, Income Inequality, and the Perception of Climate Change: a case study of small-scale cattle farmers in the Ecuadorian Andes. Sustainability, [S.L.], v. 14, n. 9, p. 5028, 22 Apr. 2022. Doi: http://dx.doi.org/10.3390/su14095028.
[9] Courdin, V.; Litre, G.; Correa, P. Desarrollo sostenible y transformaciones en la organización del trabajo femenino rural: el caso de las mujeres ganaderas del Uruguay. Sustentabilidade em Debate, v. 10, p. 41, 2014. DOI: https://doi.org/10.18472/SustDeb.v5n2.2014.10714
[10] Alexandre, G. et al. Agroecological practices to support tropical livestock farming systems: a Caribbean and Latin American perspective. Trop Anim Health Prod 53, 111 (2021). https://doi.org/10.1007/s11250-020-02537-7
[11] Manzano, P. et al. Underrated past herbivore densities could lead to misoriented sustainability policies. npj Biodiversity, 2(1), 2023a.
[12] Manzano, P. et al. Underrated past herbivore densities could lead to misoriented sustainability policies. npj Biodiversity, 2(1), 2023a.
[13] Leroy, F. et al. Animal board invited review: Animal source foods in healthy, sustainable, and ethical diets - An argument against drastic limitation of livestock in the food system. Animal. V. 16, n. 3, March 2022. Doi: https://doi.org/10.1016/j.animal.2022.100457
[14] Gerber, P.J., Steinfeld, H., Henderson, B., Mottet, A., Opio, C., Dijkman, J., Falcucci, A. & Tempio, G. 2013. Tackling climate change through livestock - A global assessment of emissions and mitigation opportunities. Food and Agriculture Organization of the United Nations (FAO), Rome.

*Suramérica*, promoted by BirdLife International, is one of the most outstanding regional examples of the conservation and appropriate use of this ecosystem.

However, the transformation of livestock production in LAC towards systems that are more efficient in terms of productivity and sustainability is currently facing major challenges. Overcoming these successfully depends on climatic, environmental, market and technological conditions, as well as installed capacities and the efficiency of inter-institutional and inter-sectoral governance systems. Some of these aspects will be addressed below.

Promoting the regenerative livestock approach contributes to the Sustainable Development Goals, in particular SDG 1, 2, 3, 8, 13, 15 and 17, as well as to the One Health initiative supported by the United Nations, which aims to direct efforts towards the integration of human health, animal health and environmental health. It is also aligned with the law passed in 2023 by the European Parliament on the import of deforestation-free products into the European Union.

Regenerative livestock farming is also in line with FAO's strategic framework for 2022-2031, the 2030 Agenda and the three initiatives established at the 37th FAO Regional Conference for LAC: sustainable agrifood systems for healthy diets for all (RI 1); prosperous and inclusive rural societies (RI 2); and sustainable and resilient agriculture (RI 3).

## II. CURRENT STATUS

Livestock is one of the leading land uses in LAC, and its economic importance is closely linked to the increase in global demand for animal protein sources such as meat and dairy. This has driven the accelerated expansion of livestock farming in recent decades, often associated with the destruction of natural environments. An example of this is the Brazilian Amazon, where there was a 120% rise in the surface area used for livestock farming between 2009 and 2019 (with the national average being 46% for the same period). The average stocking rate of pasture in the Amazon is 0.73 animal units per hectare, while the potential average is 2.5 for pastoral livestock farming in the region.[15]

According to the Tropical Agricultural Research and Higher Education Centre (CATIE), livestock is currently at the centre of a crossroads where different regional and global challenges (climate change, rural poverty, health, food security and sovereignty, migration of young people and others) converge, affecting socio-economic indicators and the livelihoods of livestock farming families. In this regard, research in this sector goes beyond the traditional boundaries of animal production sciences and compels considering many other factors to achieve resilient, productive, competitive systems with minimal impact on human health.[16]

In LAC, natural pastures account for a marginal portion of the land where livestock grazing takes place, and outside these areas, grazing is often branded for converting forest areas (and even natural pastures), with its consequent impacts on biodiversity, privatisation of public areas, expansion of territory to increase land value, use of intensification technologies, crop and breed monotony in sown pastures, erosion, and the loss of soil capacity to store carbon.

For example, the South American Pampas lost one fifth (a net loss of 8.8 million hectares) of its grassland vegetation between 1985 and 202. The combined surface area of planted agriculture and

[15] Froehlich, G.; Stabile, M.; Souza, M. L. Iniciativas de Rastreabilidade nas Cadeias de Valor da Carne Bovina e do Couro no Brasil. [S.l]: Ipam, 2022. Available at: https://ipam.org.br/wp-content/uploads/2023/03/Iniciativas_rastreabilidade_PT_v05-2.pdf.
[16] Available at: https://www.catie.ac.cr/sistemas-ganaderos-resilientes/

grasslands grew by 10.6% to 48.6 million hectares while forestry surface area (exotic tree plantations) increased by 363% to 2.8 million hectares.[17] Yet another example is Bolivia where from 2000 to 2010 forest areas converted to pastures accounted for no less than 50% of deforestation.[18]

This translates into a loss of ecosystem services, with a significant drop in productivity, food security and resilience to extreme weather events. Similarly, unsustainable and illegal livestock production practices in LAC have sparked social conflicts for local communities and indigenous peoples, jeopardizing people's safety, which is precisely what has happened in the Indio Maíz Biological Reserve in Nicaragua because of the rapid advance of the agricultural frontier into its core area.

In this context, regenerative livestock farming is a viable alternative to keeping the activity intact while protecting the ecosystem services on which it depends.

While it is true that livestock farming is currently a major source of GHG emissions (an estimated 7.1 gigatonnes (GT) of carbon dioxide equivalent (CO2-eq) per year, representing 14.5% of human-induced GHG emissions[19]) and the livestock sector has a major impact on climate change, there is also sufficient evidence and considerable progress in implementing management practices that increase production while reducing its environmental impact.

For example, in 2021, 24 methane mitigation strategies were analysed in LAC (58.3% were livestock grazing), where 16 of them showed a drop in methane without compromising animal productivity, and specifically in six, there was a 27% drop coupled with a 68%[20] rise in productivity.

Genetic improvement of animals and the heterogeneity of ecosystems are two key features of the resilience of regenerative livestock farming. Some of the most widely implemented regenerative practices in LAC are described below:

- Integrated crop-livestock-forestry (ICLF) systems, silvopastoral systems and on-farm good management practices are among the most widely used food production strategies in LAC. They provide ecosystem services and benefits such as labour demand, reduced water consumption, increased organic matter, resilience to economic and climate factors, and risk reduction. ICLF systems entails the synergistic integration of forestry, agriculture and livestock farming to maximise production and product quality, while respecting the social and environmental aspects. An example of this is dairy production by the NoCarbon and Cumbaru brands in Brazil.

- Good soil management through diversified cultivation of native or cultivated grasses can capture and store significant amounts of carbon in an integrated fashion with production, allowing for a neutral or positive balance and thus contributing to climate change mitigation. Beef production systems with well-managed and diversified pastures can reduce the area required for animal husbandry by up to seven times.
- The use of nitration-fixing species, such as forage peanut, is another production practice implemented in cattle-raising areas throughout Colombia and Costa Rica, for example. With qualified technical assistance and an appropriate management plan, these species contribute to reducing soil erosion and increasing carbon sequestration.

[17] MapBiomas. South American Pampas loses one fifth of its grassland vegetation between 1985 and 2021. 2023a. Available at: https://mapbiomas.org/en/pampa-sul-americano-perde-um-quinto-da-vegetacao-campestre--entre-1985-e-2021-2?cama_set_language=en.
[18] Müller, R.; Pacheco, P.; Montero, J. C. El contexto de la deforestación y degradación de los bosques en Bolivia. Bogor: CIFOR, 2014. Disponible en: https://www.cifor.org/publications/pdf_files/OccPapers/OP-100.pdf. Acesso em: 24 maio 2023.
[19] Available at: https://www.fao.org/3/i3437s/i3437s.pdf
[20] Congio, G. F. S; Bannink, A.; Mogollón, O. L. M. Enteric methane mitigation strategies for ruminant livestock systems in the Latin America and Caribbean region: A meta-analysis. Journal of Cleaner Production, v. 312, Aug. 2021. Doi: https://doi.org/10.1016/j.jclepro.2021.127693

- In LAC, areas suitable for livestock farming could—if managed appropriately—meet current market demand without increasing the surface area they occupy. This could be achieved through livestock intensification, the valorisation of native species and their diversity, the recovery of degraded pastures and the adaptation of livestock breeds to different climatic situations.

In addition to the livestock system management per se, the activity's sustainability is also underpinned by the capacity of governments and other sectors to comply with international agreements on climate change (such as the Nationally Determined Contributions - NDCs). In this regard, it is important to note the livestock Nationally Appropriate Mitigation Actions (NAMAs) as voluntary strategies adopted by countries for low-emission production development.

Livestock NAMAs require joint work between the designated national entity, the agricultural sector, the private sector, academia and others. In a 2021 study conducted in LAC, countries identified the lack of coordination and inadequate definition of roles and responsibilities regarding livestock NAMAs as a common weakness.[21]

The effectiveness of these interventions in the context of climate change cannot be measured from an individual point of view; on the contrary, their potential lies in their synergistic and context-specific implementation, which also includes cultural, social, economic, regulatory-institutional, political and technological aspects.

# III. CHALLENGES

The adoption of the regenerative livestock approach is globally linked to the fact that this activity is one of the main GHG emitters. However, the most important challenge for regenerative livestock farming in LAC is the uncertainty about the real capacity of production systems to adapt to increasingly uncertain and changing climate scenarios.

The ability to cope with this and to have climate change resilient systems necessarily involves efficiently addressing other associated challenges, such as the following:

- Implementation of climate-smart livestock farming.
- Preventing the expansion of production areas by improving productivity through diversification, better herd management and the use of indigenous species.
- Establishment of integrated production landscapes on a small and, above all, large scale.
- Formalising systems for monitoring, reporting and verification of GHG emissions and water consumption, e.g., mainly for grazing animals.
- Improved access to and transfer of information and technology at all levels.
- Consolidation of economic incentives and certifications on regenerative livestock farming.

While regenerative livestock production is one of the production priorities driven by the new international market conditions, more commitment and coordination by institutions, the private sector, markets and the scientific sector is still needed for its effective implementation.

# IV. RECOMMENDATIONS

[21] Marco Otárola M., Sepúlveda C., Villanueva C., Viguera B., Martinez Barón D., Arango J., Roman-Cuesta R., 2021. Gobernanza de las Acciones Nacionales Apropiadas de Mitigación (NAMA) para los sistemas ganaderos en la región de América Latina y el Caribe. Síntesis para decisores. Feb 2021.

Considering the information provided in the previous chapters, the Technical Secretariat of CODEGALAC proposes focusing on the efforts for the implementation of regenerative livestock farming based on the following recommendations:

- Strengthen mechanisms to recognise and formalise traditional knowledge, scientific evidence, monitoring and technological innovation as a basis for transforming production systems into more resilient systems and improving their socio-environmental performance.
- Ensure greater accessibility of scientific and technical information for decision-making (e.g., on risk management) and for local ownership of the importance of regenerative livestock farming.
- Establish and consolidate livestock NAMAs as guiding mechanisms at the national level for compliance with agreements on sustainable production and climate change.
- Promote policies and market strategies to ensure that small and medium-sized producers can boost their yields through increased access to the wide variety of livestock breeds and pasture species adapted to the local climate and soils.
- Promote the valorisation of endemic breeds and species both for regenerative livestock farming and for the recovery of degraded areas.
- Rehabilitate degraded pasture areas that have potential for intensive livestock use, freeing up those areas that are more suitable for other purposes.
- Establish zoning systems in areas suitable for small and, above all, large-scale livestock farming, including mixed production systems, as well as their harmonisation with areas suitable for forestry or the protection of biodiversity, water resources, among others.
- Ensure that transformation, adaptation and innovation of technological solutions facilitate soil carbon sequestration and increased livestock productivity especially in areas most susceptible to degradation.
- Establish financial and policy incentives for producers and consumers, as well as carbon and other credit lines, that contribute to the sustainable intensification and adaptation/mitigation of livestock systems to climate change.
- Continue generating evidence on the contribution of regenerative livestock farming to the sustainable development of the sector (indicators on productivity, biodiversity, carbon sequestration, etc.), to promote its implementation based on objective evidence.

Additionally, FAO, through the Technical Secretariat of the XVI CODEGALAC, offers guidance to the countries for the follow-up of the recommendations described above. This considers:

- Improved governmental capacities to design policies, programmes and legal frameworks that strengthen regenerative production and respond to social, economic and environmental priorities, as well as to establish effective governance of production systems.
- The identification, systematisation and dissemination of successful experiences that favour sustainable livestock development, which can be considered and adapted in other countries and territories.
- Support for the mobilisation of economic and technical resources to enable the implementation of actions, strategies and programmes on regenerative livestock farming.
- The facilitation of regional dialogue spaces between the public and private sector, with a view to promoting the development of joint strategies and projects for regenerative livestock production.
- Strengthening decision-making based on scientific evidence and traditional knowledge about sustainable production systems.