Opportunities to Reduce Emissions and Support Sustainable Livestock Production in the Republic of Paraguay

The Workshop, held from August 19 to 20, 2025, aimed to strengthen the productivity and sustainability of Paraguay's livestock sector by promoting sustainable technologies, effective public policies, and innovative financing mechanisms. It brought together key actors from the productive, financial, academic and governmental sectors, along with international leaders, to exchange experiences and lay the foundations for building a common roadmap towards resilient and low-emission livestock farming.

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CLEAN AIR TASK FORCE

Clean Air Task Force (CATF)

Clean Air Task Force (CATF) is a global non-profit organization that works to protect against the worst impacts of climate change by catalyzing the rapid development and deployment of low-carbon energy and other climate protection technologies. With 25 years of internationally recognized experience in climate policy and an unwavering commitment to exploring all possible solutions, CATF is a pragmatic, non-ideological group that advocates for the bold ideas needed to address climate change. CATF has offices in Boston, Washington D.C., and Brussels, and staff working virtually around the world.

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SECTION 1

Introduction

The livestock sector is an important pillar of the Paraguayan economy; it is also one of the largest emitters of greenhouse gases (GHG), particularly methane, in the country.

Paraguay has committed to reducing its GHG emissions by 20% by 2030, and there is a significant opportunity for the country to move towards this goal through policies that both enable livestock development and methane mitigation.

However, in order to meet these climate goals and increase the sector's productivity, it is essential to have the acceptance and support of stakeholders.

To further strengthen the potential of Paraguayan livestock producers, not only as key actors in the economic and social development of the country, but also as a sector that can effectively contribute to the mitigation of GHG emissions, the General Directorate of Air under the Ministry of Environment and Sustainable Development (DGA/MADES, in Spanish) requested for the Climate and Clean Air Coalition Coalition (CCAC) to replicate the objectives of the *Scaling Methane Mitigation in Sustainable Tropical Agri-Food Systems* workshop that took place in Brazil in September 2024.[1] Topics such as productive technologies with methane mitigation potential, research on policies and innovations, financing mechanisms and implementation strategies on the ground, among others, were addressed in the Brazil workshop.

As a result of this request, the DGA/MADES together with Clean Air Task Force (CATF) co-hosted the workshop, ***Opportunities to reduce emissions and support sustainable livestock production in the Republic of Paraguay***, from August 19 to 20, 2025. The workshop brought together experts and key stakeholders to strengthen Paraguay's capacity for a more sustainable and productive livestock sector through sustainable technologies, effective public policies, and innovative financing mechanisms such as carbon credits. Key actors from the livestock, financial, academic, and governmental sectors, along with international leaders, met to exchange experiences and lay the foundations for the construction of a common roadmap towards resilient and low-emission livestock farming. The content of the workshop and its resulting discussions are fundamental inputs for the development of this document whose objective is to facilitate decision-making regarding productivity and mitigation measures in the livestock sector in Paraguay.

The Livestock Sector in Paraguay

Paraguay's cattle herd was registered at approximately 13.5 million head in 2023, 1.2 million of which are registered in the Paraguayan Traceability System (SITRAP, in Spanish). This overall headcount is projected to decrease to 13.1 million head in 2025,[2] due to a higher slaughter rate in 2024, especially of female cattle, and lower calf production in recent years because of dry conditions.[3]

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1 *Outcome Workshop on Scaling Methane Mitigation in Sustainable Tropical Agrifood Systems.* (2024, September 3). Climate & Clean Air Coalition. https://www.ccacoalition.org/resources/outcome-workshop-scaling-methane-mitigation-sustainable-tropical-agrifood-systems

2 Ayala, E. (2024, August 3). Paraguay expands its livestock sector with growth in production and exports. MarketData. https://marketdata.com.py/laboratorio/analisis/paraguay-expande-su-sector-ganadero-con-crecimiento-en-produccion-y-exportaciones-134342

3 A fall in the cattle herd is projected due to greater slaughter and less replacement. (2024b, September 20). Productive. https://www.productivacm.com/archivos/21437

With approximately 200 thousand farms nationwide, it is estimated that about 80% of the national herd is concentrated in just 6% of them, or roughly 12 thousand farms. This smaller percentage makes use of modern export-oriented production systems, with animals 15-20% heavier than those destined for the domestic market.[4]

Meat production in Paraguay occurs on full-cycle farms (40%), breeding farms (27%), and less than 8% is dedicated to rearing and fattening. Dairy production occurs on 5% of the cattle farms. Dual-purpose production, which includes both milk and meat production, accounts for 18% of all cattle farms. Productivity in dual-purpose systems is low, and it is estimated that dual-purpose establishments obtain, on average, 3 liters of milk per day.[4]

The economic importance of the livestock sector in Paraguay

Livestock in Paraguay is a strategic pillar of the national economy, with a significant impact on the generation of wealth, exports, and employment. Its contribution to the economy extends beyond primary production, encompassing a vast value chain that has shown remarkable dynamism in recent years.

According to the Rural Association of Paraguay (ARP, in Spanish), the **meat value chain, which includes production, industry and associated services, contributes approximately 12% of the country's Gross Domestic Product (GDP)**, which is equivalent to USD 5,800 million.[5] This sector is one of the largest job creators in the country, providing work to about 272 thousand people. Of these, the vast majority, 93%, are in the productive sector in the countryside, while 5% are in services and 2% in the meatpacking industry. In addition, 85% of the 122,000 livestock producers are small, with less than 100 head of cattle, using livestock as a "savings bank" to cover basic needs.

In Paraguay, the agriculture sector is the main trade driver, generating 74.8 per cent of Paraguay's export earnings. The dynamism of the livestock sector is strongly reflected in its exports. The year 2024 was historic for beef exports, with a record volume of 353 million kilograms and revenues of USD 1,777 million. The trend continued in the first half of 2025, with a growth of 37% compared to the same period of the previous year. The main markets for Paraguayan beef in 2023 were Chile (36%), Taiwan (11.8%) and Russia (11.6%), with the United States and Israel also ranking among the key destinations in 2024 and 2025. It should be noted that Paraguay exported 75% of the total livestock slaughtered in 2024, and it is estimated that it produces food for 80 million people (while its population is just over 6 million). This makes the country comparable to Uruguay, which exports 79% of its livestock production.

The dairy sector annually moves USD 400 million and generates employment for approximately 8,000 people directly and 40,000 indirectly.[9] Industrial milk production reached 880 million liters in 2023 and remained robust in 2024. Dairy exports have grown significantly, from USD 20 million in 2020 to USD 60 million in 2023. In addition, 2024 set an export record with 22,318 tons and revenues of USD 80.2 million. Brazil is the main destination for Paraguayan dairy products. The sector aims: 1) to increase domestic consumption, which is below recommended levels, and 2) to expand exports by taking advantage of the country's competitive conditions.

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4 World Bank.2024. How to accelerate the adoption of climate-smart practices and technologies in Paraguay? © World Bank.

5 Nacional, E. (2023, November 10). Economy. President of the ARP analyzes challenges and opportunities in the livestock sector. https://elnacional.com.py/economia/presidente-arp-analiza-desafios-oportunidades-sector-ganadero-n5710

6 Netto, J. (2025, March 12). Responsible production: How Paraguay manages to be a sustainable livestock producer recognized in the world. MarketData. https://marketdata.com.py/educacion/economia-facil/produccion-responsable-como-paraguay-logra-ser-un-productor-ganadero-sostenible-reconocido-en-el-mundo-140076/

7 Mereles, R. (2025, January 3). *Paraguay set a record with the export of more than 350 million kilos of beef in 2024.* .::IP Agency::. https://www.ip.gov.py/ip/2025/01/02/paraguay-marco-record-con-la-exportacion-de-mas-de-350-millones-de-kilos-de-carne-bovina-en-2024/

8 Paraguay achieves record number in beef exports. (2025b, July 7). PMU. https://www.ugp.org.py/2025/07/07/paraguay-logra-cifra-record-en-exportacion-de-carne-bovina/

9 ABC Color. (2024, November 20). The national dairy moves about US$ 400 million a year. ABC Color. https://www.abc.com.py/economia/2024/11/20/la-lecheria-nacional-mueve-unos-us-400-millones-al-ano/

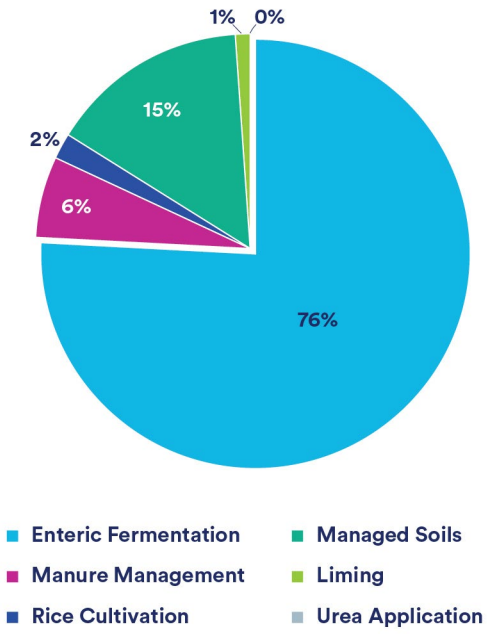
SECTION 2

GHG Emissions from the Livestock Sector in Paraguay

While the livestock sector is an economic engine, its growth is linked to significant environmental and social challenges that require increased attention to ensure sustainable growth. Livestock emits methane (CH_4), from enteric fermentation and manure management, and nitrous oxide (N_2O), from the burning of vegetation and the use of fertilizers, gases that have a significantly higher global warming potential than carbon dioxide (CO_2). Specifically, methane has a global warming potential at least 80 times greater than carbon dioxide during its atmospheric lifetime. Additionally, the rearing of livestock, especially in the Chaco region (western part of the country), is intrinsically linked to high rates of land-use change that result not only in greenhouse gas emissions but also in the loss of biodiversity in the region.

Globally, the agriculture and livestock sector accounts for 42% of anthropogenic methane emissions.[10] However, due to its significant activity, Paraguay's livestock sector accounted for 50.3% of national emissions in 2021, 76.2% of which was attributable to methane emissions from enteric fermentation (see Figure 1).[11]

Figure 1: Emissions GHG of the Agriculture and Livestock Sector, 2021[11]



[10] United Nations Environment Programme (2025). Global Methane Status Report. Paris.

[11] MADES-DNCC/UNDP-GEF. 2024. Paraguay's National Greenhouse Gas Inventory Document, 1990-2021 series. 1BTR + 5NC/2BTR project. Asunción, Py. 507.

Globally, methane emissions from the livestock sector are expected to increase 8% by 2030 and 17% by 2050 (compared to 2020 levels).[10] However, the sector has the potential to reduce 8% of its emissions (compared to 2020 levels) during this decade globally.[12] Similar sectoral risks and opportunities exist at the national level in Paraguay, according to Paraguay's Nationally Determined Contribution (NDC) 3.0, which states that, the implementation of measure AG.1 Good Livestock Production Practices (BPPG) is estimated to result in the mitigation of 2,570.3 kt CO_2eq by 2030.[13] However, the sector's mitigation potential is even greater, and tapping it will require significantly improved productivity.

The World Bank and FAO have proposed that the country prioritize the development and adoption of climate-smart technologies and practices adapted to the local context.[14] These measures should be complemented by robust financial products and extension services to accelerate their implementation.[14] Additionally, given that the livestock sector is vulnerable to climate change, prioritizing mitigation and adaptation actions in this sector is crucial.

12 United Nations Environment Programme (2025). Global Methane Status Report. Paris.

13 MADES. 2025. Third Nationally Determined Contribution (NDC 3.0) of the Republic of Paraguay. Asunción, Paraguay. 137 p.

14 World Bank. Paraguay – How to Accelerate the Adoption of Climate-Smart Practices and Technologies in Paraguay?: Recommendations for Family Farmers of Cassava, Soybeans, and Cattle (Spanish). Washington, D.C.: World Bank Group. http://documents.worldbank.org/curated/en/099082624085597662

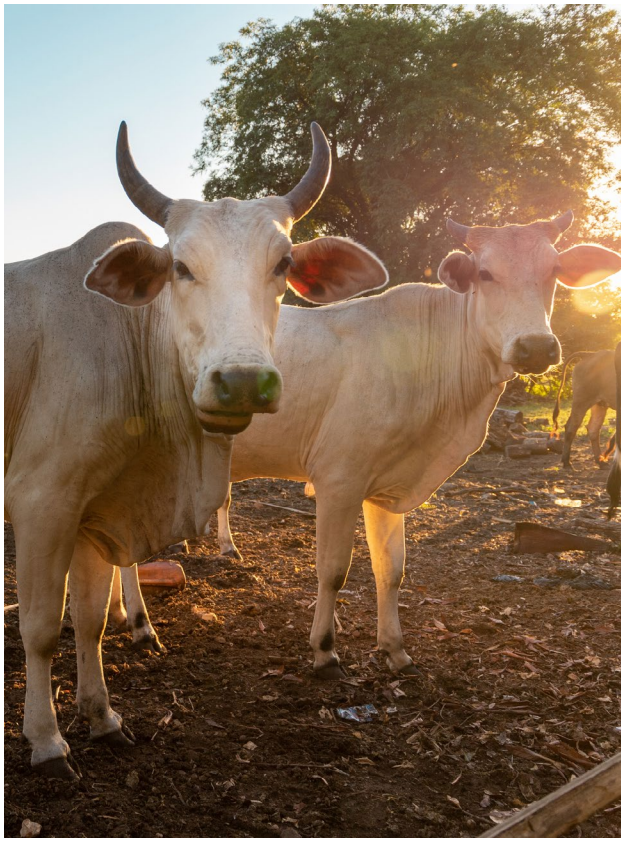
SECTION 3

Key National Laws and Policies Governing Agricultural Production and the Environment

At the sectoral level, policies are articulated under the Agricultural Sector Policy Framework (MPSA, in Spanish) 2020-2030. The key contribution of these public policies is also linked to Paraguay's NDC Update 3.0.[15] This legal and political structure seeks to ensure that the Paraguayan livestock sector meets national commitments, such as the goal of reducing GHG emissions by 20% by 2030.

In general, GHG reduction is central to many documents (e.g., Law 5875, Law 7190, sectoral plans). However, livestock farming as a specific sector and the reduction of methane (a key gas in cattle farming) is not always explicitly mentioned.

The Sectoral Mitigation Plans include agriculture and livestock within GHG emissions and potential actions analysis, which opens the door to concrete measures but not always documented in general policies. Table 1 below presents selected key national laws and policies governing the sector.



[15] MADES. 2025. Third Nationally Determined Contribution (NDC 3.0) of the Republic of Paraguay. Asunción, Paraguay. 137 p. https://unfccc.int/documents/497852

Table 1: Summary of the Main National Laws and Policies Governing the Livestock Sector in Paraguay (Non-Exhaustive), a Ranking on the Inclusion of Methane Intensity Reduction in these Policies

National Law or Policy	Short Description	Methane Intensity Reduction Opportunities Highlighted?
Climate Change and Risks		
National Development Plan 2050	Long-term strategy that outlines national priorities for economic, social and environmental development. Pillar 3 highlights the promotion of comprehensive and responsible waste management and the maintenance of emission levels in line with sustainable development priorities.	Methane reduction opportunities are not envisaged.
LAW 5875/2017 (National Climate Change)	General framework for planning and responding to climate change, with a focus on GHG mitigation and adaptation. It promotes GHG reductions and participation in carbon markets. It does not mention livestock productivity or specific reduction of methane for livestock.	Methane reduction is implicit in GHG reduction. However, there are opportunities to expand work with these sectors.
LAW 7190/2023 (Carbon Credits)	It establishes a system for the ownership and trading of carbon credits linked to emission mitigation.	Opportunities are envisaged to extend the Law to the livestock sector.
DECREE No. 3246/2020	Regulates the National Forest Monitoring System of Paraguay.	Since it mentions GHG reduction targets, it is possible to expand its scope to monitor enteric methane emissions in silvopastoral schemes.
Agricultural Sector Policy Framework 2020 – 2030	It is a document that sets the course to follow as well as the challenges to be faced, such as the competitiveness of livestock and forestry production in the sector, including its agro-industrial derivatives. Its strategic pillars are overcoming poverty, strengthening competitiveness and the promotion of sustainable production while minimizing negative environmental impacts.	There is opportunity. The use of more technology, increased productivity, and soil conservation in livestock farming is a priority.
National Climate Change Policy (PNCC)	It seeks to integrate climate management into national development, promoting low-carbon and resilient growth, with a focus on adaptation, mitigation, ecosystem restoration and development of a green economy, integrating NDC 3.0.	Opportunities are envisioned.
National Climate Change Mitigation Strategy	It seeks to reduce greenhouse gas emissions through actions such as reducing deforestation, using renewable energies and efficient cookstoves, sustainable agriculture and waste management, all under Paraguay's National Climate Change Policy and its NDC.	Opportunities are envisioned.
National Strategy for Adaptation to Climate Change	Sets the issue of Climate Change in the country and promotes articulated actions between the sectors conducive to reducing vulnerability, increasing resilience, reducing and managing risks, mitigating impacts and achieving adaptation to variability, climate impact and extreme events, as well as taking advantage of the opportunities it generates, in order to achieve the well-being of the population, within the framework of the commitments derived from international conventions and national policies.	Opportunities are envisioned to include the reduction of enteric methane through the genetic improvement of the cattle herd, increasing the productive efficiency of those affected.
Sectoral Mitigation Plans	Instruments by sector to reduce GHG emissions.	There is a great opportunity to work on the reduction of enteric methane GHG by promoting Integrated Systems, Good Agricultural Practices.

National Law or Policy	Short Description	Methane Intensity Reduction Opportunities Highlighted?
Forest Management and Deforestation Prohibition		
6676/2020 ("Zero Deforestation"):	It prohibits the transformation of native forests for agricultural use or urbanization, seeking to protect, recover and improve the native forest for environmental and social functions. Applies exclusively to the Eastern region.	An opportunity to contribute to the objectives of the Decree is envisioned.
LAW 422/1973 (Forestry)	It forces producers with private properties to maintain 25% of forests. Applies only to the Western region.	An opportunity to contribute to the objectives of the Law is envisioned.
LAW 3001/2006 (Environmental Services)	It establishes a mechanism for the Valuation and Remuneration of Environmental Services (PSA, in Spanish) to encourage the conservation, protection and recovery of natural resources, creating Environmental Services Certificates (CSAs, in Spanish), which are economic instruments where those who conserve ecosystems sell certificates to those who generate negative impacts. Related to GHG reduction through capture and potential use in offsets but does not address livestock productivity or specific methane reduction.	Opportunity to contribute to the objectives of the Law is envisioned.
Environmental Impact		
LAW 294/1993 (Environmental Impact Assessment)	It allows the identification, forecasting and estimation of the environmental impacts generated by ongoing or planned projects and activities.	Opportunity to contribute to the objectives of the Law is envisioned.
LAW 4241/2010 (Reestablishment of Protective Forests of Watercourses)	It is applied throughout the national territory, seeking the recovery of vegetation around water sources.	Opportunity to contribute to the objectives of the Law is visualized.
LAW 3239/2007 (on Water Resources)	It defines the regime for water management.	Opportunity to contribute to the objectives of the Law is visualized.

In addition, other national policies that are focused on the country's climate action are the National Strategy and Action Plan for the Conservation of Biodiversity (ENPAB, in Spanish), the National Forest Strategy for Sustainable Growth (ENBCS, in Spanish).

It should be noted that the Ministry of Environment and Sustainable Development officially presented the Third Nationally Determined Contribution 3.0 in 2025.[16] In its NDC 3.0, the country ratifies its commitment to reduce emissions by 10% with its own financing and a further 10% reduction with international financing.

The report highlights the main actions to be taken for enteric fermentation methane mitigation in the livestock sector is "through improvements in animal diet, adapted to the type of predominant production system, and to promote carbon sequestration in the country's pastoral systems", whose expected reduction impact by 2030 is 2,570.33 kt CO_2e.[16] To support the renewed commitment by MADES, strong support will be required from programs to strengthen capacities to help meet mitigation goals. **As of the date of writing of this report, MADES is awaiting comments/approval by the UNFCCC for validation.**

[16] MADES. 2025. Third Nationally Determined Contribution (NDC 3.0) of the Republic of Paraguay. Asunción, Paraguay. 137 p. https://unfccc.int/documents/497852

Mitigation measures contemplated in Paraguay's NDC 3.0

In the Technical Annex of NDC 3.0, Paraguay describes mitigation measures in the Agriculture and Livestock Sector. Lines of action mentioned are:

- **Improved productivity:** Priority is given to producing more meat with fewer emissions per unit of product. This is achieved through genetic improvement, reproductive efficiency, animal health and pasture management, over and above high-cost technologies such as additives.
- **Knowledge management:** The need for "boots on the ground" technical assistance and practical demonstrations in the field to overcome barriers of perception in the producer was identified.
- **Incentive models:** Replication of successful models such as Brazil's ABC/ABC+ Plan, which combines science with credit at preferential rates for the recovery of degraded lands, is suggested.

SECTION 4

Opportunities and Challenges to Reduce the Environmental Impact of Paraguayan Livestock Farming

The main opportunity for Paraguay is to develop a joint working group that brings together multiple stakeholders (e.g., the private sector, the government, academia and civil society) in the development of public policies that stimulate the development of livestock farming with multiple objectives: greater competitiveness for the private sector and compliance with the commitments that MADES reiterated in its Technical Annex of Paraguay's NDC 3.0.

The livestock sector faces significant productivity and sustainability challenges that limit its sustainable growth potential. The great challenge is to achieve greater production with optimized costs, maintaining quality, and consolidating a long-term vision.[17] In fact, a report prepared by the Paraguayan Sustainable Meat Roundtable summarizes the technological gaps that could be improved in order to achieve economic and environmental sustainability:[18]

- **Decrease livestock mortality in the country:** The current rate stands at 1.2%.
- **Improvement in average stock rate:** The national average is 0.8 livestock units per hectare, which demonstrates a predominance of extensive systems.
- **Improvement in calf/cow ratio (birth rate):** The birth rate is at 53% (range 45% to 55%), indicating a significant margin for improvement in reproductive efficiency.
- **Improvement in the average female and male weaning weight:** An average of 130 kg/female calf is recorded, a value that directly impacts the time needed for the first service.
- **Increased use of improved genetics with technical assistance:** Only 22% of producers use improved genetics accompanied by technical assistance to increase productivity.

Other indicators also need to be improved such as the weight of the animal at slaughter that could increase by 25% to improve profitability.[19] Additionally, there is a lack of trained labor and deficient data measurement and management, which are structural bottlenecks that prevent the mass adoption of advanced practices.[20] These challenges must be addressed through public policies in conjunction with the **private sector, government, financial agents and civil society in order to reduce the gaps**.

17 *"The challenge for Paraguayan livestock is to produce more at the lowest cost and while maintaining the quality of the product."* (n.d.). https://www.valoragro.com.py/ganaderia/el-desafio-de-la-ganaderia-paraguaya-es-lograr-producir-mas-con-el-menor-costo-y-manteniendo-la-calidad-del-producto/

18 Medina, M., Carrillo, R., & Rojas, R. (2024). Lines of action for the strengthening of sustainable livestock farming in Paraguay: Characterization of Paraguayan livestock and economic, social, environmental and animal welfare indicators. In Paraguayan Sustainable Meat Table (MPCS) (Ed.), http://www.carnesostenible.org.py/. Paraguayan Sustainable Meat Table (MPCS). Retrieved December 3, 2025, from https://carnesostenible.org.py/wp-content/uploads/2024/12/PublicacionMPCS-Lineas-de-Accion-para-el-Fortalecimiento-de-la-Ganaderia-Sostenible-en-Paraguay.docx-2.pdf

19 Seratti, F. (2026, January 14). Fernando Serrat: Paraguay can reach 16 million heads, but first we have to be efficient. *Infonegocios*. https://infonegocios.com.py/infoganaderia/fernando-serrati-paraguay-puede-llegar-a-16-millones-de-cabezas-pero-primero-hay-que-ser-eficientes

20 *The challenges of Paraguayan livestock: improving productivity and recovering the herd.* (n.d.). https://valoragricola.com.py/los-desafios-de-la-ganaderia-paraguaya-mejorar-la-productividad-y-recuperar-el-hato/

The livestock sector can increase its productivity through the adoption of reproductive biotechnologies such as fixed-time artificial insemination (IATF, in Spanish) and embryo transfer, the adoption of improved genetics, as well as nutritional and animal health management.[21] In addition, FAO has shown that technologies such as agro-silvopastoral systems, forage conservation, food supplementation, and excreta management can increase income per hectare by 66% compared to baseline, with a reduction in total GHG by 12.6%, and GHG emissions intensity by 20.8% (in case of low intensifications). In the case of medium and high intensification systems, income per hectare could exceed 50% while total CO_2 emissions are reduced by about 26%.[22] However, the success of these technologies depends on comprehensive management that includes nutrition optimization and professional pasture management. Training farmers and professionals is critical to closing the adoption gap and raising productivity. The implementation of silvopastoral systems, which integrate livestock with afforestation, not only improves efficiency and productive resilience, but also generates long-term economic value.[23] **Thus, environmental sustainability is presented as a competitive advantage, not as an obstacle.**

On the other hand, reviewing the Technical Annex of Paraguay's NDC 3.0 reveals common objectives and shared challenges faced by the Paraguayan livestock sector in simultaneously increasing productivity and environmental sustainability. Producer profitability challenges are intrinsically linked to the climate solutions proposed in NDC 3.0. **They are not separate agendas, but complementary ones:**

- **Efficiency as Mitigation (AG.1.1 vs. Productivity):** The private sector needs to shorten production cycles to reduce costs. The AG.1.1 measure of the NDC promotes strategic supplementation and better nutrition. By improving nutrition, the slaughter age is reduced and, therefore, the amount of methane emitted during the animal's life is reduced, achieving the goal of "producing more with fewer emissions".
- **Pasture Management (AG.1.3 vs. Animal Load):** The private sector operates with a low load of 0.8 head/ha. The NDC measure AG.1.3 seeks to improve carbon sequestration through regenerative management and recovery of degraded pastures. Implementing silvopastoral or rotational systems not only meets the climate goal of carbon sequestration, but also increases the receptivity of the field, improving profitability per hectare.
- **Technology Adoption (Gaps vs. Goals):** Low adoption of genetics (22%) and reproductive technology (IATF) slows down herd growth. NDC 3.0, to meet its reduction target of 2,570 kt CO_2eq, depends on the private sector adopting these technologies. Therefore, public policies (e.g., NDC 3.0) must function as leverage to finance and train the producer in these practices.[21]

The opportunity for Paraguayan livestock farming lies in transforming efficiency challenges (e.g., low breeding, long cycles) into its main climate strategy. The implementation of the Good Livestock Production Practices (GMPPs) outlined in NDC 3.0 provides the technical framework for the private sector to increase its profitability while meeting Paraguay's international commitments. **Environmental sustainability is not a cost – it's a way to optimize production.**

Leaders in the livestock sector say that Paraguay's institutional **framework promotes predictability and long-term investment**.[24] By combining its competitiveness in price and quality with a strategy focused on local innovation and sustainability, the country can consolidate its position as a global leader, not only in volume, but also in responsible and differentiated value production.[25]

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21 ABC Color. (2022, June 8). Paraguay must shorten production cycles in cattle ranching. ABC Color. https://www.abc.com.py/economia/2022/06/08/paraguay-debe-acortar-ciclos-productivos-en-ganaderia-bovina/

22 https://openknowledge.fao.org/server/api/core/bitstreams/932c32cc-38b1-4a56-b229-ec8f0d186126/content FAO. 2022. Practices and technologies for low-emission livestock farming. Santiago de Chile. https://doi.org/10.4060/cc1972es

23 SILVOPASTORAL SYSTEMS IN PARAGUAY. (n.d.). ssuu. https://issuu.com/gerenciacea/docs/revista_cea_5ta_edici_n_digital/s/23158157

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25 Fleytas, M. (2025, January 31). Green pass. *Paraguay launches its first certification of meat responsible for biodiversity.* https://infonegocios.com.py/infoganaderia/paso-verde-paraguay-lanza-su-primera-certificacion-de-carne-responsable-con-la-biodiversidad

SECTION 5

Stakeholder Experiences and Learnings: Workshop 2025

The Paraguay workshop was presented as a platform to foster **collaboration and knowledge sharing** to create practical strategies that improve productivity and contribute to methane mitigation in the country's cattle production. Inspired by the success of a similar workshop in Brazil, the objectives of the event focused on analyzing **sustainable technologies** such as regenerative pasture management and silvopastoral integration, improving productivity, and measuring progress in the sector. In addition, climate finance opportunities were explored, where the Minister of the Environment and Sustainable Development for Paraguay, Rolando de Barros, highlighted that the country has the potential to generate between 250 and 500 million dollars annually through **carbon credits**.

In his speech, the Minister stressed that the current global challenge is **to produce more, but responsibly**, with **low carbon emissions**. In addition, he highlighted traceability as a key element that must be incorporated into the new production models promoted by MADES. The minister's message framed both the challenges and opportunities facing the sector. The main **challenge** is overcoming economic and environmental barriers through innovation and regional cooperation, striking a balance between increased production and sustainability. The great **opportunity** lies in the adoption of clean technologies and the capitalization of climate finance to transform the sector. The Minister expressed confidence that collaboration among key stakeholders – spanning the productive, financial, academic, international cooperation, and governmental sectors – will enable the development of a shared roadmap toward a resilient, competitive, and low-emission livestock sector.

The Importance of Private Sector Leadership: The Experience of Candice Muxfeldt

Candice Muxfeldt is the president of the *Asociación Agropecuaria de Agua Dulce* (APAD) and also leads her own cattle ranch, *Agropecuaria Don Oscar S.A*. Candice has developed a clear vision of the opportunities offered by the integration of environmental services and livestock production and has transferred this vision not only to her farm, but also to APAD and its partners. Candice implemented a rigorous pasture management system to boost productivity while preserving forest cover. By engaging employees in systematic rotational grazing, the farm increased stocking density in the Chaco ecosystem from 0.7 to 3 livestock units per hectare – more than quadrupling productivity per unit area.

This visionary leadership is also shaping her work within APAD. A major challenge to overcome is the negative perception that all stakeholders, including ranchers and the public, have of both livestock production and environmental protection. Here, communication becomes essential. Candice also stressed that, in order for ranchers to increase their productivity and significantly change their production methods, there are many barriers that need to be overcome, such as access to adequate financial products and improved roads and access to processing plants in the Chaco region. It is also urgent to develop locally measured values for the environmental impacts and benefits of the different practices adopted by livestock farmers in the region. This local data can provide a competitive advantage to Paraguayan products and open access to high-yield markets.

Deploying Technologies in the Field

The field day was held at the **Ganadera Arandu** ranch, where practical measures were observed to increase livestock productivity in a sustainable way, such as rotational grazing, balanced diets and genetic improvements. As part of the field visit, Engineer **Martín Mongelos (of De Raíz)** led the conversations on the opportunities and gaps to scale up sustainable livestock practices in Paraguay. The visit emphasized the importance of joining forces between the government, producers, academia and civil society, while also working with neighboring countries to accelerate the transition to low-emission livestock farming. On this occasion, Engineer Mongelos presented case studies based on De Raiz's own experience, demonstrating how a comprehensive approach can lead to significant increases in productivity and environmental benefits.

Case Study: Combining increased productivity and environmental benefits in livestock production in Paraguay

Adequate technical assistance has the power to significantly transform livestock production systems. De Raiz, a technical consulting group from Paraguay, has extensive experience in implementing long-term plans and actions for Paraguayan ranchers with the aim of improving productivity, economic profitability, and reducing their environmental impact.

De Raíz presented a case study comparing two scenarios: one representing an average cattle ranch in Paraguay, and one after a specialized consultancy focused on the productive management of pastures with regenerative management. The average livestock operates on 2,000 hectares with a receptivity of 0.3 livestock unit (LU, a cow with approximately 380 kg that weans a calf) per hectare (ha). The capacity (loading) of the area has reduced from 1,478 animals in 2014 to only 971 in 2024. The average weaning is 57% (49% – 66%),

Figure 1: Ecological Status Index (ESI) of a Grassland in 2023, Before the Implementation of the Management Directed by the De Raíz Technical Group, Until 2025, with the Support of the De Raíz Team

Nat A5 – Jarigua'a 5
ISE: -40
2023

Nat A5 – Jarigua'a 5
ISE: 35
2024

Nat A5 – Jarigua'a 5
ISE: 40
2025

and the weaning weight is 150 kg, with an Ecological Status Index (ESI) of -15. This is measured through the GRASS tool which evaluates key indicators such as vegetation cover, biodiversity and soil condition, using an objective and repeatable methodology over time.

De Raiz implemented technical assistance aimed at the recovery and management of pastures in a livestock farm in Paraguay with an average ESI of -40 in 2023. They used methodological planning that considers the three fundamental pillars that must be aligned with business or family objectives: 1) How to use and regenerate natural resources (land), 2) How to organize and adjust production systems (production), and 3) How to give predictability and economic sustainability to the process (finances). In 2 years, the ESI was 40, increasing forage availability for animals, and potentially sequestrating carbon in the soil and reducing methane intensity.

This example demonstrates the potential to scale up planning and regeneration across the country. Paraguay has 10,066,625 hectares of natural grasslands (2022). According to De Raíz's estimates, a possible impact of USD 225 M on the national economy could be achieved by scaling up to 1.5 million hectares. Scaling up to 3 million hectares could reach USD 450 million, a figure comparable to the USD 429.3 million generated by Itaipu in 2022.

It is necessary to scale up the processes that are already showing results in the field to reach more producers. These schemes integrate land planning, production, and finance to align productivity with regeneration. Financing can multiply its reach and accelerate transformation at the national level.

Opportunities in Paraguay for the Development of Sustainable and Low-Emission Livestock Farming from the Workshop Discussions

Following the presentations and discussions, the recommendations made by panelists, attendees, and national authorities were compiled to further develop and adapt technological and financial initiatives that will help the country optimize its sustainable production policies to reduce emissions, with key actions established by each stakeholder. Therefore, to meet the workshop's central objective of "strengthening Paraguay's capacity to produce more and sustainably" and "increasing methane mitigation efforts", the following actions are suggested based on the panels' findings (Table 2).

Table 2: Summary of Opportunities Identified Per Stakeholder

Local and Regional Data	Research and Development (R&D)	Financial Products	Public Policies	Regional and Global Collaboration
Government				
• Quantify emission intensity by region and by stage of livestock production to develop local coefficients and avoid using global metrics that do not reflect Paraguay's productive reality. • Define clear and measurable targets for improving productivity and reducing emission intensity. • Integrate key data from public institutions (Catastro, INFONA, MADES, and SENACSA) to strengthen governance and decision-making.	• Develop integrated projects to characterize local production systems and generate applied evidence. • Strengthen academia and national research centers (UNA, IPTA) to develop local emission factors, measure carbon sequestration in silvopastoral systems and grasslands, and improve the accuracy of the national GHG inventory (INGEI). • Prioritize solutions adapted to local systems, where improvements in reproductive efficiency and herd productivity can deliver greater mitigation benefits than high-cost advanced technologies. • Evaluate the economic feasibility of technologies, practices, and public policies before their adoption and scaling. • Develop measurement tools for emissions and carbon sequestration that are more precise, simpler, and low-cost. • Promote the participation of Paraguayan R&D groups in regional initiatives and projects (such as PROCISUR and the GRA) to strengthen technical capacities and develop local solutions. • Actively contribute to the regional data repository proposed by PROCISUR to strengthen the Southern Cone's position in international climate negotiations.	• Develop mixed financial products (e.g., Eco-Invest in Brazil). • Develop a sustainable taxonomy for the livestock sector to support greater investment in sustainable practices.	• Formalize a permanent inter-institutional working group (MADES, MAG, ARP, academia, and civil society) to monitor the NDCs and sectoral policies. • Define a livestock sector roadmap, jointly with the private sector and other organizations. • Establish a priority research and development (R&D) agenda. • Design sectoral policies that integrate productivity and emission reductions, ensuring inclusion of small producers. • Promote policies focused on basic infrastructure (such as passable roads) that enable investments in productive technologies and practices. • Develop mixed financial products that facilitate the adoption of productive and environmental improvements. • Communicate clearly the progress on sustainable, productive, low-emission livestock at the national and international levels. • Coordinate with private technical assistance to ensure effective use of financial incentives for producers.	• Coordinate cooperation with regional and global countries and organizations. • Strengthen the exchange of regional experiences for the development of successful public policies, such as Brazil's ABC+ Plan and Argentina's data-integration initiative.

Local and Regional Data	Research and Development (R&D)	Financial Products	Public Policies	Regional and Global Collaboration
Private Sector				
• Develop a regional data-exchange system to promote transparency and facilitate access to carbon markets. • Invest in traceability systems throughout the livestock supply chain. • Support the collection of productive data by all actors involved in the beef value chain.	• Define an R&D agenda focused on quantifying sustainability attributes through demonstration units, supporting the development of a monitoring, reporting, and verification (MRV) framework. • Implement demonstrative pilot projects under the new Paraguayan law to validate MRV methodologies and generate the first marketable success cases. • Establish field schools and continuous technical assistance, prioritizing hands-on, practical experiences as the main driver of adoption of sustainable practices. • Develop case studies using real-world examples to identify opportunities and challenges by region and to support joint actions between the government and financial actors.	• Develop low-interest, long-term credit lines together with the financial sector.	• Shift the narrative around emission reductions, which often generates negative perceptions, to focus instead on the benefits of profitable production that incorporates environmental advantages. • Support the development of a hybrid extension program to assist financial agencies and the government.	• Work proactively through organizations such as APAD, ARP, La Mesa Sostenible, and others, identifying opportunities for training, R&D, financing, and the development of strategic partnerships (e.g., with the World Bank).
Financial Institutions				
• Develop a system for monitoring productive performance data to support green financing products.	• Collaborate with R&D to develop low-cost parameters for MRV (Monitoring, Reporting, and Verification) to enable the granting of credit for green financial products. • Collaborate with the private sector to overcome the operational limitations of financial institutions in providing the technical assistance that must accompany credit. A hybrid model – with structured alliances in which financing (AFD/private banks) is conditioned on or accompanied by technical assistance provided by producer associations (ARP/CREA), the Ministry of Agriculture and Livestock, or academia – is one option.	• Develop financial products tailored for small producers through AFD. • Create special conditions that incentivize investment in sustainable productive practices. • Strengthen and expand green financial products (such as Procampo Verde). • Adjust loan terms, interest rates, and impact metrics based on the financial and environmental results obtained.	• Collaborate with local governments to attract low-cost international capital aimed at green products and linked to productivity goals. • Develop mixed and innovative financial products, drawing on experiences such as Eco-Invest in Brazil. • Coordinate with the public sector to overcome operational limitations and ensure that credit is accompanied by adequate technical assistance.	• Act as a coordination platform that connects the productive sector with the technical support of multilateral organizations and specialized institutions to strengthen capacities. • Coordinate with private technical assistance to implement financial incentives for producers.

Local and Regional Data	Research and Development (R&D)	Financial Products	Public Policies	Regional and Global Collaboration
Civil Society and International Organizations				
• Provide technical and financial support to improve the quantification, monitoring, reporting, and verification of local emissions.	• Financially support the economic and social analysis of the impact of public policies on the livestock sector. • Strengthen technical training and capacity development at the national level. • Promote integration and exchange among national, regional, and international experts.	• Work with the sector to develop green financial products.	• Strengthen national technical capacities through workshops, scientific publications, scholarships, and open-access tools. • Provide technical and financial support for the design and implementation of public policies.	• Promote the integration of the national R&D system with international networks, such as the GRA (Global Research Alliance).

Many opportunities were identified for Paraguay, and the main opportunities are concentrated on:

- **Traceability and data:** The need for comprehensive digital platforms that unify the chain's information to validate environmental attributes in international markets was highlighted as a key priority highlighted by Argentina.
- **Efficiency as mitigation:** The priority strategy for Latin America should be to reduce emissions *intensity* by increasing productivity: producing more meat with fewer emissions per unit, prioritizing genetics and reproductive efficiency, animal health, and proper pasture management. Expensive technologies such as additives can be used if there is a clear economic benefit. Investments in local research and development are essential.
- **Innovative models of financial incentives:** Green financial products suitable for livestock production which reduce the risk of investments on the farm, such as Eco-Invest in Brazil, are an opportunity to expand the adoption of sustainable practices in the field.
- **Proven public policy models:** The Brazilian model (Plan ABC/ABC+) demonstrates that combining science with credit at preferential rates manages to scale up the recovery of degraded lands, being a replicable scheme for Paraguay. Learning with countries in the region and sharing experiences of public policies and incentive models and developing regional research collaboratively is an opportunity.
- **Knowledge management and regional and global collaboration:** The main barrier is not always financial, but perception. Practical technical assistance and field demonstrations ("learning by seeing") are required for the producer to embrace sustainability. In addition, communicating the need for emission intensity reductions for the livestock sector to demonstrate the opportunity for productive and economic improvement is essential.

This workshop opened the conversation between different stakeholders on the need to integrate the economic development of the Paraguayan livestock sector with environmental actions and helped lay the groundwork for outlining a roadmap. The immediate next steps proposed by speakers, workshop attendees, and local authorities were:

- **To define subsequent actions** to develop and implement a roadmap for the Paraguayan livestock sector, focusing on reducing emissions intensity, enhancing productive efficiency, and integrating public policies with appropriate green financial incentives.
- **To form a multi-sectoral working group** that will focus on developing a strategy for the sector that integrates development and environmental services, including methane intensity reduction.

Ultimately, the transition to a more productive and low-emission livestock sector is opportunity to deliver lasting environmental outcomes for Paraguay while strengthening the livelihoods of the farmers and ranchers who will be at the heart of this effort. CATF will continue to support Paraguay as it moves forwards towards a more sustainable livestock production.

Appendix

Workshop Agenda

Opportunities to reduce emissions and support sustainable livestock production in Paraguay

The workshop agenda is shown below, note that modifications to presenters and timelines occurred during the implementation of the workshop.

Dates and Location:
August 19 & 20, 2025
Asunción, Paraguay

Day 1: Tuesday, August 19, 2025

Time	Proposed Topic	Speakers and Moderators
8:00 – 8:30	Registration	
8:30 – 9:00	Welcome remarks	**Speaker: Minister Rolando de Barros** Ministry of Environment and Sustainable Development, Paraguay **Speaker: Minister Carlos A. Giménez Díaz** Ministry of Agriculture and Livestock, Paraguay
Public Policies and Opportunities for Collaboration		**Moderator: Fernanda Ferreira** Doctor of Veterinary Sciences Director of Agriculture Methane Clean Air Task Force
9:00 – 9:30	Building a Regional Approach to Sustainable Cattle Farming: A First Experience in the Southern Cone and Bolivia	**Speaker: Luisa Fernanda Lema Vélez** Senior Sector Specialist of the Division of Agriculture and Rural Development, Inter-American Development Bank
9:30 – 9:50	The ABC plan and the road to COP 30: Brazil's role in leading global discussions on sustainable agriculture	**Speaker: Bruno Brazil** Director of the Department of Sustainable Production and Irrigation, Ministry of Agriculture and Livestock, Brazil
9:50 – 10:05	Lower emissions and increased productivity: the role of the Global Methane Hub in supporting research and public policy in South America	**Speaker: Santiago Fariña** Program Officer for Agriculture-Livestock Global Methane Hub
10:05 – 10:20	Sustainable livestock farming in Argentina and the support of public policies	**Speaker: Julieta Battistuzzi** Advisor on Environment and Sustainable Production, Ministry of Agriculture, Livestock and Fisheries of Argentina
10:20 – 10:45	Discussion	
10:45 – 11:15	Coffee break	

Time	Proposed Topic	Speakers and Moderators
Opportunities for the Advancement of the Development of Low-emission Livestock in Paraguay		**Moderator: Gustavo Ruíz Díaz** Sustainable Livestock Consultant
11:15 – 11:30	Environmental public policies to stimulate sustainable livestock farming in Paraguay	**Speaker: Lilian Portillo** Director of Strategic Planning, Ministry of Environment and Sustainable Development, Paraguay
11:30 – 11:45	Opportunities and challenges of carbon credits for livestock and government support	**Speaker: Victor González** Director of Carbon Markets, Ministry of Environment and Sustainable Development, Paraguay
11:45 – 12:00	The perspectives of rural producers in Paraguay	**Speaker: Calixto Saguier** Member of the Board of Directors of the Rural Association of Paraguay
12:00 – 12:30	Discussion	
Lunch		
12:30 – 13:30	Lunch	
Roundtable: Funding Opportunities		**Moderator: Amanda León** President, Agricultural Habilitation Credit
13:30 – 14:00	Financing opportunities for sustainable livestock farming in Paraguay	**Speaker: Irene Wasilevsky** Senior Agriculture Economist, The World Bank **Speaker: Stella Guillen** President, Development Finance Agency of Paraguay
14:00 – 14:30	Discussion	
14:30 – 15:00	Coffee break	
Research and Development of Sustainable Technologies for Cattle Ranching in South America and Opportunities for Collaboration		**Moderator: Mirtha Giménez** Doctor of Veterinary Sciences Livestock Production Specialist
15:00 – 15:15	Innovations in the reduction of livestock emissions in South America and the importance of PROCISUR	**Speaker: Elly Navajas** Director of the Livestock System, INIA Uruguay and Coordinator of the Sustainable Livestock WG of PROCISUR
15:15 – 15:30	Low-emission livestock projects in Argentina and the support of the Climate and Clean Air Coalition	**Speaker: Pablo Cañada** Senior Environmental Analyst – Research and Development Unit, CREA Argentina
15:30 – 15:45	The Global Research Alliance in South America: its projects and how they support governments in the region	**Speaker: Nicolas Costa** Climate Change Consultant, New Zealand Agricultural Greenhouse Gas Research Center, and Global Research Alliance
15:45 – 16:00	Sustainable livestock farming in Paraguay: institutionality, traceability and property management as integrating axes	**Speaker: Diego Ocampos** Research Professor and Professor of Animal Nutrition and Meadows and Forages II of the Agronomic Engineering Career UNA
16:00 – 16:15	Applied Research in Paraguay: Regenerative Agriculture, Advances	**Speaker: Candice Muxfeldt** President, Agropecuaria Don Oscar S.A., and Asociación Agropecuaria de Agua Dulce, APAD
16:15 – 17:00	Discussion	

Time	Proposed Topic	Speakers and Moderators
Final Words		
17:00 – 17:15	Policies for livestock production in Paraguay	**Speaker: Marcelo González** Vice Minister of Livestock, Ministry of Agriculture and Livestock of Paraguay
17:15 – 17:30	Final Words	**Speaker: Gilda Torres** Director of Air Quality Management, Ministry of Environment and Sustainable Development, Paraguay
Coffee and Networking		
17:30 - 18:00	Coffee and Networking	

Day 2: Wednesday, August 20, 2025

Time	Proposed Topic	Speakers and Moderators
6:30 – 10:30	Departure from MADES to Ganadera Arandu with breakfast	
10:30 – 13:00	Applied research projects: the sustainable livestock farming work of the Ganadera Arandu team **Engineer Martín Mongelos (De Raíz)** will present the document, "Production and Ecosystems in Paraguay: Evidence and Conditions to Accelerate Transformation."	**Speaker: Martin Mongelos** De Raíz
Lunch and Networking		
13:00 – 14:30	Lunch and Networking	
14:30 – 18:30	Return to Asunción	