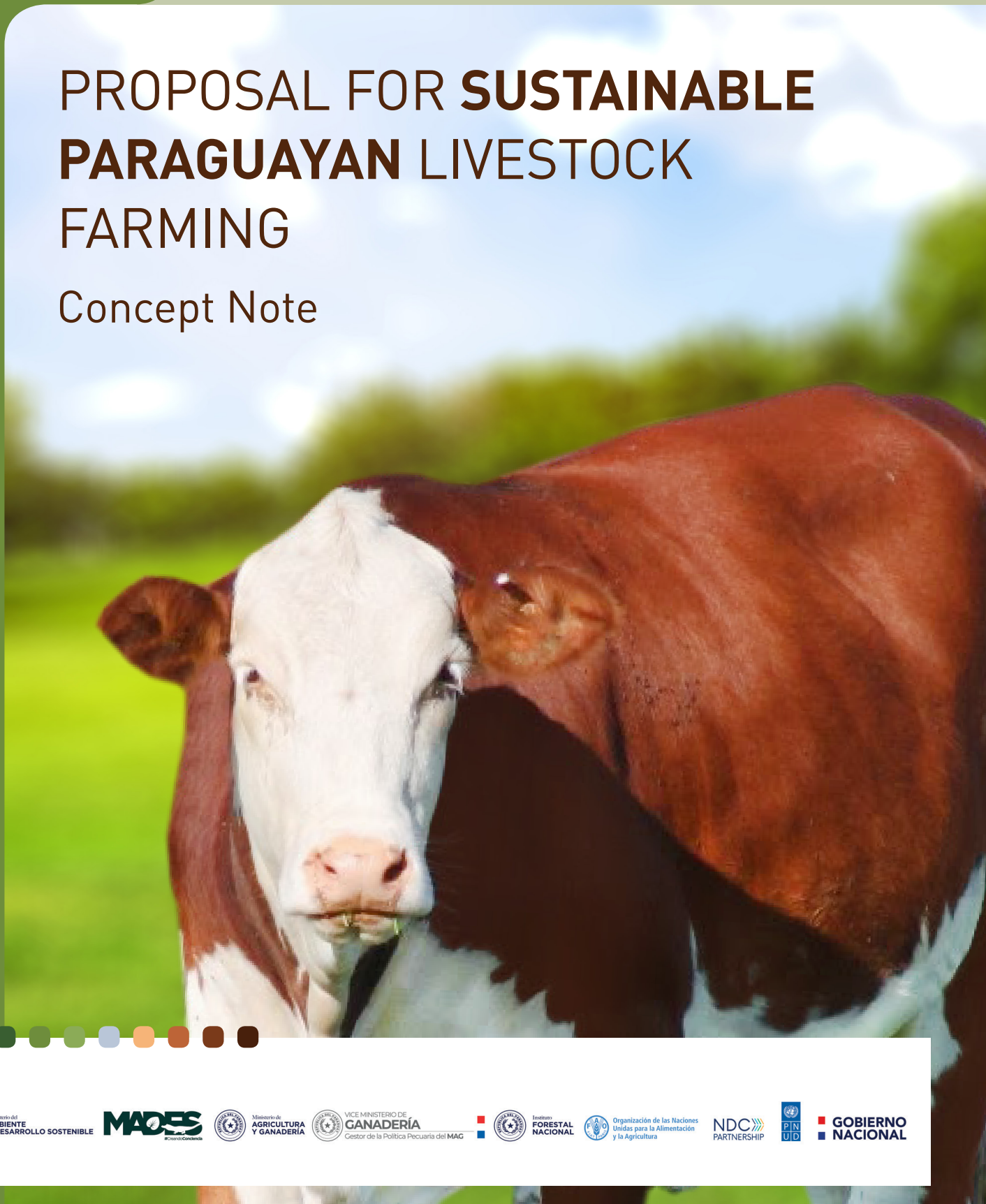
PROPOSAL FOR **SUSTAINABLE PARAGUAYAN** LIVESTOCK FARMING

Concept Note



Ministerio del AMBIENTE Y DESARROLLO SOSTENIBLE · MADES · Ministerio de AGRICULTURA Y GANADERÍA · VICE MINISTERIO DE GANADERÍA, Gestor de la Política Pecuaria del MAG · Instituto FORESTAL NACIONAL · Organización de las Naciones Unidas para la Alimentación y la Agricultura · NDC PARTNERSHIP · PNUD · GOBIERNO NACIONAL

DOCUMENT PRESENTATION

This document summarizes the key elements considered in the design/planning process of what could be the Proposal for Sustainable Paraguayan Livestock Farming; it was developed by a consulting team[1], under the leadership of the Ministry of Environment and Sustainable Development, the Ministry of Agriculture and Livestock and the National Forestry Institute, with the objective of building a preliminary draft, which can serve as a basis to start conversations with the productive sector and if there is interest, it can be reviewed, adjusted and validated by the parties, to be eventually presented to international funding windows.

What does the Proposal for Sustainable Paraguayan Livestock Farming projected to 2030 seek?

This proposal seeks to compile good practices implemented or to be implemented by the livestock sector that, in addition to generating benefits in productivity and business profitability, provide benefits to the environment (including climate change adaptation and mitigation).

The proposal will also address those activities that are not being implemented due to lack of technical assistance or funding and, if there is consensus, it may be submitted to funding agencies.

In addition, this proposal seeks to be developed in a "participatory manner" with all sectors linked to livestock farming.

Why present a Proposal for Sustainable Paraguayan Livestock Farming?

Our country is currently implementing actions with a focus on sustainability (economic, social and environmental), which can be a tool to differentiate the products of Paraguayan cattle (Paraguayan meat and dairy products) in premium niches and markets, and the Proposal for Sustainable Paraguayan Livestock Farming could be a tool that meets this goal.

The implementation of the Proposal for Sustainable Paraguayan Livestock Farming can be considered cost-efficient and of great impact, opening the way to productive efficiency, increased C sequestration and direct or indirect reduction of Greenhouse Gas (GHG) emissions per unit of product or surface area, thus improving the profitability of production systems.

This proposal can also lay the technical groundwork for the carbon neutrality of livestock production in Paraguay and a resilient development plan for the livestock sector, given its high vulnerability to climate change, exacerbated by its landlocked status (National Directorate of Climate Change [DNCC, for its acronym in Spanish] / Ministry of Environment and Sustainable Development [MADES, for its acronym in Spanish], 2021).

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[1] Within the framework of the projects: (a) "Support for planning a National Appropriate Mitigation Action (NAMA) for Paraguayan Livestock Farming " implemented by FAO and (b) "Climate Promise", implemented by UNDP.

WHERE ARE WE?

Current situation of cattle farming in the country

According to Paraguay's National Development Plan 2030, the country foresees its greatest development opportunity as a global food production platform.

Paraguay, in the last decade, has managed to position itself in the top ten of the world's meat exporting countries. Even the vision of the National Meat Value Chain Development Plan (Vice-Ministry of Livestock [VMG, for its acronym in Spanish] / Ministry of Agriculture and Livestock [MAG, for its acronym in Spanish], 2016) placed Paraguay as the 5th largest meat exporter by 2021. However, the livestock herd and export volume has decreased in recent years, revealing an opportunity to improve the articulation of public-private policies to optimize the competitiveness of the meat sector.

In the case of dairy cattle, the margin for improving national productivity and competitiveness is even greater, both for fresh milk and dairy products (UN Trade, 2008 and National Animal Health and Quality Service [SENACSA, for its acronym in Spanish] Export Statistics, 2020/21).

Growing demand for meat and milk worldwide

By 2050, it is expected that humanity will demand more than half as much food as in its entire history (Clark, 2013). This increase is related to demographic growth, purchasing power and the consumption of high biological value proteins by the population of emerging economies.

With respect to 2010 baseline values, FAO has estimated the increase in demand for meat and milk at +73% and 78%, respectively, and all this will pose a great challenge for the sustainable intensification of agricultural exporting countries.

Regional advances in sustainable livestock farming initiatives

Some countries in the region, also meat and dairy producers, have been working on sustainable livestock farming initiatives with an emphasis on low emissions or carbon neutrality (see Figure 1); in this regard, Brazil is one of the first countries to promote its production in the process of obtaining the designation of "sustainable meat", committing itself to low-emission livestock production through a Sectoral Plan for mitigation and adaptation to climate change for the consolidation of a low-carbon economy in agriculture (ABC Plan).

Uruguay, on its part, is seeking to generate its first certification of carbon-neutral meat and differentiate it in the international market, within the framework of the social and economic dimension of environmental added value. Finally, various studies show that beef cattle production in Argentina has a lower impact on GHG emissions than the international value, specifically for extensive field breeding systems, combined with intensive rearing and fattening systems.

Picture 1: Website: INTA INFORMA

News/Meat

August 18, 2021

Argentine Meat generates emissions below international values

A study carried out by INTA together with INTI and the company Tigonbú showed that greenhouse gas emissions from beef produced in extensive field breeding systems, combined with intensive rearing and fattening systems, are lower than those recorded by international studies. The key lies in the sustainable management of diets.

Picture 2: Website: INNOVAGRO

Research develops a protocol to produce meat by neutralizing gas emissions by Embrapa, Brazil

Country: Brazil

Date: September 11, 2020

Research develops a protocol to produce meat by neutralizing gas emissions by Embrapa, Brazil.

Picture 3: Web page: Trabajo Interinstitucional

Uruguay's first carbon neutral meat seal

23/06/2021

The National Director of Biodiversity and Ecosystem Services of the Ministry of Environment, Gerardo Evia, together with the Minister of Livestock, Agriculture and Fisheries, Carlos María Uriarte, participated in the signing of the agreement between Montes del Plata and BPU Meat Uruguay, with the aim of generating the first carbon neutral meat certification in Uruguay and thus differentiate our meat in the international market, for a consumer that every day demands more environmentally friendly products.

Figure 1. Regional advances in sustainable livestock initiatives.

On the other hand, Paraguay has also participated in exchanges and initiatives related to sustainable livestock farming, including, to mention a few, the following: (a) the south-south exchange with Costa Rica, in 2016, on livestock NAMAS, and (b) the application to the CTCN[2]

[2] https://www.ctc-n.org/

for the development of a Silvopastoral NAMA in 2017, both initiatives without any concrete results. However, in the 2019 Euroclima Roundtable, there were identified priority lines of action on climate change that the sectors wish to work on, one of them was to work on the Silvopastoral NAMA; thus, an application to the Climate Action Assistance Package (CAEP) of the NDC Partnership was initiated to request technical assistance for the planning of a possible NAMA for the Livestock sector.

This request was approved by the NDC Partnership and channeled through two cooperation agencies, FAO and UNDP. Therefore, at the beginning of 2021, the process of hiring the consulting team began, which then under the leadership of the Ministry of Environment and Sustainable Development, the Ministry of Agriculture and Livestock and the National Forestry Institute, built a proposal, in order to begin discussions with the productive sector, and if there was interest and consensus among the parties, would move towards the participatory construction of the Proposal for Sustainable Paraguayan Livestock Farming.

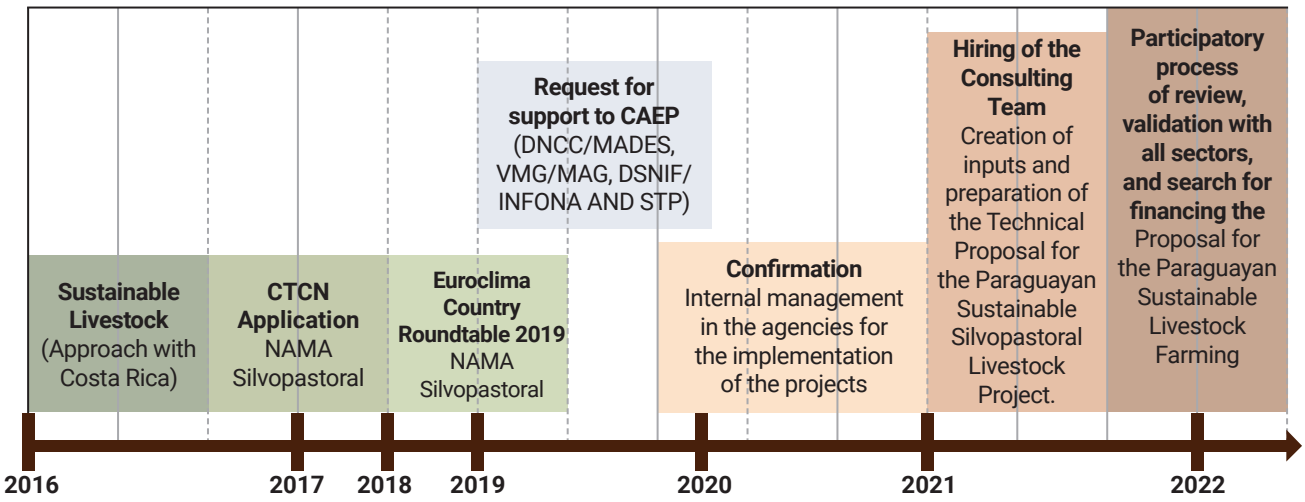
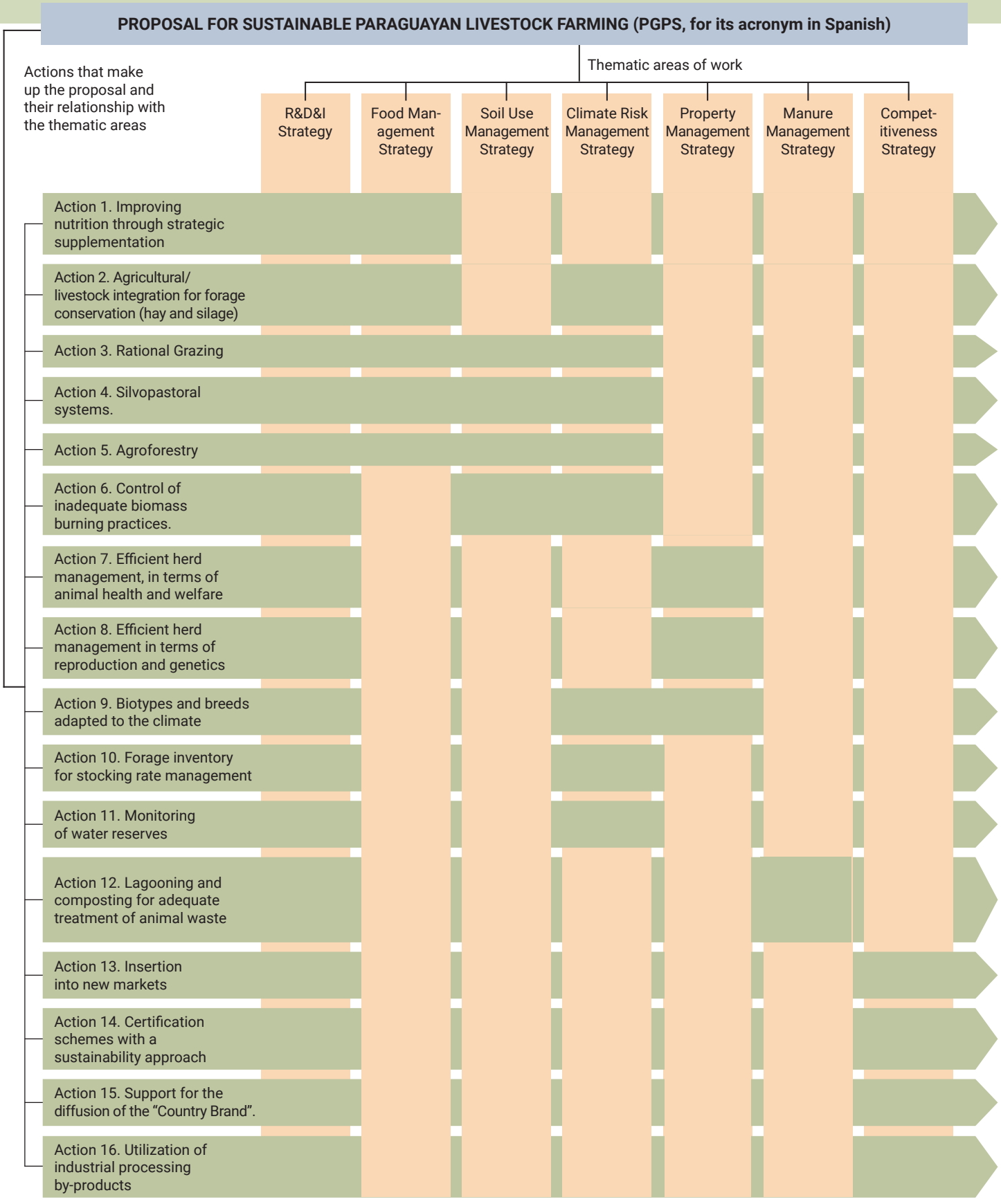


Figure 2. Timeline of national sustainable livestock initiatives.

WHAT DO WE PROPOSE?

The proposal seeks to address the sustainability of livestock production through intervention in thematic areas (strategies); this approach allows us to plan interventions based on the prioritization of issues that the key actors carry out. Intervention in these thematic areas is carried out through actions that, in many cases, generate benefits in more than one thematic area. Figure 3 shows the strategies that make up the proposal and the actions proposed to intervene in them.

Figure 3. Structuring of the Proposal for Sustainable Paraguayan Livestock Farming.


PROPOSAL FOR SUSTAINABLE PARAGUAYAN LIVESTOCK FARMING (PGPS, for its acronym in Spanish)
Actions that make up the proposal and their relationship with the thematic areas
Thematic areas of work
R&D&I Strategy
Food Management Strategy
Soil Use Management Strategy
Climate Risk Management Strategy
Property Management Strategy
Manure Management Strategy
Competitiveness Strategy
Action 1. Improving nutrition through strategic supplementation
Action 2. Agricultural/ livestock integration for forage conservation (hay and silage)
Action 3. Rational Grazing
Action 4. Silvopastoral systems.
Action 5. Agroforestry
Action 6. Control of inadequate biomass burning practices.
Action 7. Efficient herd management, in terms of animal health and welfare
Action 8. Efficient herd management in terms of reproduction and genetics
Action 9. Biotypes and breeds adapted to the climate
Action 10. Forage inventory for stocking rate management
Action 11. Monitoring of water reserves
Action 12. Lagooning and composting for adequate treatment of animal waste
Action 13. Insertion into new markets
Action 14. Certification schemes with a sustainability approach
Action 15. Support for the diffusion of the "Country Brand".
Action 16. Utilization of industrial processing by-products

Strategies of the Proposal for Sustainable Paraguayan Livestock Farming

Food Management Strategy

Cattle productivity and consequently farm profitability are strongly influenced by diet type, so proper management provides the opportunity to increase animal performance in order to meet the demand for quality products to the ever-growing world population, while decreasing the environmental impact. Likewise, nutritional strategies must be strategically integrated with management practices, sanitation, and breeding programs for cattle; aiming to meet the requirements at each stage of the cattle life cycle.

Soil Use Management Strategy

Adequate soil management is an essential factor for livestock farming, as it is crucial for regulating the quantity and quality of water supplied to the natural environment, as well as for regulating the climate and protecting ecosystem services and biodiversity. The availability and quality of soil is a determining factor in meeting the various needs for food, biomass (energy), fiber, forage, and other products. Through various actions such as the implementation of silvopastoral systems and rational grazing, this strategy aims to ensure favorable soil conditions for adequate vegetation growth, particularly through organic matter management, increased soil biotic activity and carbon sequestration from the atmosphere.

Climate Risk Management Strategy

The livestock sector in Paraguay is threatened by four main extreme weather events: droughts, floods, frosts and high temperatures (Ministry of Agriculture and Livestock, [MAG, for its acronym in Spanish]-FAO, 2016). Climate change in the region is characterized mainly by the increased frequency of these events that generate significant productive and economic losses to the agricultural sector (IPCC, 2021). The “Climate Risk Management” strategy seeks to mitigate or reduce the negative impact caused by extreme weather events through actions that propose the diversification of economic activity, the adoption of technologies and the implementation of good livestock farming practices.

Property Management Strategy

The productive efficiency and economic income of a cattle farm depend on genetics, fertility, growth rate, animal conformation, health status and favorable environmental conditions. Thus, this strategy addresses efficient management practices in relation to bovine genetics, health, reproduction, and welfare.

Manure Management Strategy

This strategy focuses on the correct management and utilization of the residual products of any livestock activity, with the purpose of converting them into useful by-products that in turn present a minimum risk to the environment.

Competitiveness Management Strategy

This strategy aims to improve the insertion and maintain the positioning of the national livestock sector through added value and the strengthening of value chains, the creation of sustainability attributes to pre-existing protocols such as the "country brand" and incursion into new international markets with greater socio-environmental demands. It should be noted that this strategy may also include the development of certifications or incentives that stakeholders consider to be of interest, including the use of existing programs in the region, such as the Natural Meat program, as a low C production strategy under conditions of C sequestration in grazing.

R&D&I Strategy

This strategy is considered a transversal axis to all the other proposed strategies since the benefits of this strategy can only be shown through it. Thus, for example, the development of the MRV protocol for mitigation actions will require the generation of country-specific emission factors (tier 2 or 3) under experimental conditions, in order to demonstrate the impact of the interventions carried out (e.g., supplementation of cattle). On the other hand, development and innovation refer to the transfer of technologies that provide solutions to the problems of the productive sector.

Actions of the Proposal for Sustainable Paraguayan Livestock Farming

Action 1. Improving nutrition through strategic supplementation

Strategies supported: R&D&I Strategy and Food Management Strategy

The Paraguayan territory, in spite of having an excellent capacity for cattle breeding, in many cases does not allow the cattle producer to provide the cattle with all the nutritional requirements, whether for milk or meat production or for the production that they need on a daily basis. Therefore, feed, concentrates and mineral salts provide the producer with different nutritional solutions to produce more efficiently. This action aims to cover all the needs and the different nutritional requirements of the various breeds of animals raised in each geographical area of the country, and in their different life cycles.

Action 2. Agricultural-livestock integration for the forage conservation (hay and silage)

Strategies supported: R&D&I Strategy, Food Management Strategy and Climate Risk Management Strategy

The action focuses specifically on the production and conservation of forage for livestock through the combined use of agricultural products obtained on the same farm, since it is necessary to establish alternatives for animal feed. One of the essential problems of livestock production occurs during the dry season and transition period, when the pasture does not sufficiently cover the requirements of the animals, this problem together with other factors such as the increase in the price of raw materials for the production of food, labor, as well as inadequate management in terms of herd size, rotation, fertilization, weed control, animal load, significantly affect the quality of feed, frequency and consumption.

The main methods used in Paraguay to conserve forage consist of haymaking (mainly of tropical grasses: Gatton Panic, B. brizantha, Mombaza) and sorghum or corn silage during the summer, to cover the deficit during the winter period, which is generally the period of greatest nutritional requirements of livestock. Likewise, it is also common to plant corn for intensive fattening during the winter. Generally, the residues are purchased from processors that make oils, among others (soybean expeller, corn middlings, barley bagasse).

Action 3. Rational Grazing

Strategies supported: R&D&I Strategy; Soil Use Management Strategy and Climate Risk Management Strategy

Rational grazing is a grazing management system based on harmonizing the principles of pasture development, with the needs of the animals, with the improvement of soil management, through biotic processes, under human intervention (Voisin, et al., 1994). It consists of rotating the cattle on the land to prevent the soil from compacting (especially during the rainy season), thus allowing the soil to rest and improving the regrowth of the pasture. This system is being applied in the country by the livestock sector, has a high potential for scalability and a relatively low implementation cost (Ruiz, 2020).

Action 4. Implementation of Silvopastoral Systems (SSP)

Strategies supported: R&D&I Strategy; Food Management Strategy, Soil Use Management Strategy and Climate Risk Management Strategy

Silvopastoral systems (SSP) can be defined as the natural combination or deliberate association of one or several woody components (shrubs and/or trees) within a pasture of grasses and herbaceous legumes, native or cultivated, and their use with grazing ruminants (National Forestry Institute [INFONA, for its acronym in Spanish], 2009). For Paraguayan livestock, two types of SSP can be classified according to their objective: SSP for timber production and SSP for forage production.

Action 5. Agroforestry

Strategies supported: R&D&I Strategy; Food Management Strategy, Soil Use Management Strategy and Climate Risk Management Strategy

This action combines the production of grasses with native forage legumes, such as carob (Prosopis sp), or exotic legumes such as Leucaena (Leucaena leucocephala). One of the main qualities of these legumes is that during winter and drought they continue to produce forage of very good quality, unlike grasses. In addition, these legumes have a high capacity to fix atmospheric nitrogen (N) to the soil, in symbiosis with bacteria (Rhizobium sp.) that are lodged in their roots, and have the capacity to transform atmospheric N into nitrogen compounds that can be assimilated by grasses and other plants.

Action 6. Control of biomass burning practices

Strategies supported: R&D&I Strategy; Soil Use Management Strategy and Climate Risk Management Strategy

This action aims at the proper management and control of the burning of pastures and agricultural/livestock residues, in order to prevent possible situations that escape intervention and result in catastrophic events such as excessive fires and material, animal and/or human losses. In this regard, the only form of authorized burning is prescribed burning (Law No. 4014/2010 on fire prevention and control).

Action 7. Efficient herd management, in terms of health and genetics

Strategies supported: R&D&I Strategy and Property Management Strategy

Increasing livestock production is achieved primarily in two ways: (a) by improving the environment in which they live and (b) by improving their genetic capacity to produce; thus, animal husbandry practices are intrinsically correlated with animal health, production and welfare, in addition to diet composition management. To maintain optimal animal production and high-quality products in a safe and efficient manner, a focus must be placed on actions related to:

- Animal genetics: selection process by means of defined criteria and objectives, mating of superior animals that produce small genetic changes, but cumulative in the production of successive progenies;
- Health: prevention of disease incidence and improvements in longevity, which have also been linked to improvements in:
- Animal welfare: cattle exposed to prolonged stressful situations can also result in weight loss, decreased production (milk or meat) and increased susceptibility to disease. Therefore, proper management not only has ethical implications, but also affects the quantity and quality of the product.

Action 8. Efficient herd management in terms of reproduction

Strategies supported: R&D&I Strategy and Property Management Strategy

Efficient management of reproduction seeks to increase the production of kg/ha and kg/head by maximizing the percentage of calf marking. To achieve this, adequate nutrition, health and genetics in the field are necessary. In addition, proper herd management is required and there are tools that can help improve calf marking rates such as: use of reproductive technologies such as artificial insemination and calf management tools such as restricted weaning, temporary weaning and early weaning.

Action 9. Biotypes and breeds adapted to high temperatures

Strategies supported: R&D&I Strategy; Soil Management Strategy and Climate Risk Management Strategy

Heat stress in cattle leads to a decrease in the animals' productive rates, which results in significant economic losses. Numerous studies indicate that the most efficient and economically profitable action to reduce losses associated with heat stress is the adoption of genetics adapted to high temperature climatic conditions (Façanha, et al., 2019) (Cardoso, et al., 2015) (Santana Jr, et al., 2018). This action becomes even more relevant in the Chaco area, where there are more extreme conditions than in the rest of the country regarding high temperatures. Zebu or Bos Indicus cattle breeds originated in tropical countries, and have a natural adaptation to the conditions of these regions. In Paraguay, a high percentage of cattle is still zebu, and many producers use breeds that are crosses of zebu cattle and Bos Taurus or British cattle, which are mainly from areas where high temperatures are not a determining factor. The crossbreeding of these two cattle species results in a hybrid breed (eg. Brangus, Braford) that seeks to combine and enhance the adaptation and hardiness of zebu cattle and the productivity of British cattle.

Action 10. Monitoring of forage inventory associated with stocking rate and climatic forecasts

Strategies supported: R&D&I Strategy and Climate Risk Management Strategy

Monitoring the forage inventory, especially at the onset of winter, when grass growth is at its highest, allows the producer to know the amount of feed available. With this information, the farmer can predict how much forage will be available for a given period of time, depending on the animal load of the field. Along with weather forecasts, especially in years when drought is predicted, the producer can make decisions in advance to mitigate the economic losses caused by this event.

Action 11. Monitoring of Water Reserves

Strategies supported: R&D&I Strategy and Climate Risk Management Strategy

The monitoring of water reserves associated with the stocking rate allows knowing for how long water is available for livestock, especially in fields that have surface water reservoirs fed by rainfall. It is particularly useful to know if there will be enough water to get through the winter, which is the time when there is very little rainfall and therefore the water reservoirs are not recharged. By linking with climate forecasts, early decisions can be made to mitigate economic losses caused by drought.

Action 12. Lagooning and composting for adequate treatment of animal waste

Strategies supported: R&D&I Strategy and Manure Management Strategy

The management practices of waste from livestock production (urine, manure, mixed effluents) are aimed at ensuring the recovery and recycling of nutrients and energy contained in the manure. In this way, this action aims at improving efficiency in the use of energy in the supply chain, reducing strong odors and consequently contributing to good property management in terms of welfare and reducing the possibility of polluting watercourses. Good management includes the implementation of lagooning systems or manure treatment by composting, which is later reused as a soil fertilizer, this action is applied in large-scale farms that carry out intensive fattening in confinement.

Action 13. Insertion into new international markets

Strategies supported: R&D&I Strategy and Competitiveness Strategy

This is an action aimed at the search for niches and premium markets, since in spite of the positioning achieved and the opening of some ≈80 export markets for the national meat sector, many of them or their blocks (e.g., NAFTA and most Asian countries), with more attractive prices, have not yet been conquered by the country. In addition, it is known that these markets to be conquered and those to which the country already has access, in a short or medium term could propose "para-tariff" barriers to which Paraguay must create competitiveness strategies (environmental or otherwise) and strengthen its monitoring systems. In the case of dairy cattle, as detailed in previous sections, the margins for improving competitiveness are even greater.

Action 14. Certification schemes with a sustainability approach

Strategies supported: R&D&I Strategy and Competitiveness Strategy

It is an action that seeks to improve the competitiveness of the livestock sector for "niche markets or consumers" demanding standards or certification schemes with an approach to socio-environmental sustainability, while generating profitability for the primary sector. For example, regional market intelligence studies indicate that products such as silvo-agricultural

products are increasingly in demand worldwide (Office of Agricultural Studies and Policies [ODEPA, for its acronym in Spanish], 2013) and Paraguay could develop public-private partnerships to define "attributes", "certify" and "monitor" actions for the implementation or maintenance of Silvopastoral systems, rotational grazing areas and other actions contemplated in the framework of the Proposal for Sustainable Paraguayan Livestock Farming.

Action 15. Development and diffusion of the country brand

Strategies supported: R&D&I Strategy and Competitiveness Strategy

The "country brand" is a system of recognition granted by the Ministry of Industry and Commerce (MIC) to individuals or legal entities for standing out in various fields (e.g., medicine, generation of sources of employment, industrial development, etc.), and this particular action seeks to develop and propose attributes of environmental sustainability to the pre-existing "country brand", as an incentive and differentiation tool that contributes to the competitiveness of the national livestock sector.

Action 16. Use of by-products from industrial livestock processing

Strategies supported: R&D&I Strategy and Competitiveness Strategy

In addition to the production of meat and milk (main products), cattle comprises a livestock species with more than 100 by-products that can be used at the industrial level (Contexto Ganadero, 2017). Thus, for example, in the meat industry, by-products are defined as secondary or derived elements outside the carcass that are obtained after the slaughter process, with the generation of income associated with their commercialization of up to 7% in Latin America and up to 32% in Europe (Stalin et al., 2020). It is possible to foresee, therefore, the great opportunity for industrial exploitation that this action offers, at the same time as it allows improving the competitiveness of "still unconventional" livestock items in the country.

HOW WILL IT BE IMPLEMENTED?

The following figure summarizes the implementation stages for the Proposal for Sustainable Paraguayan Livestock Farming.

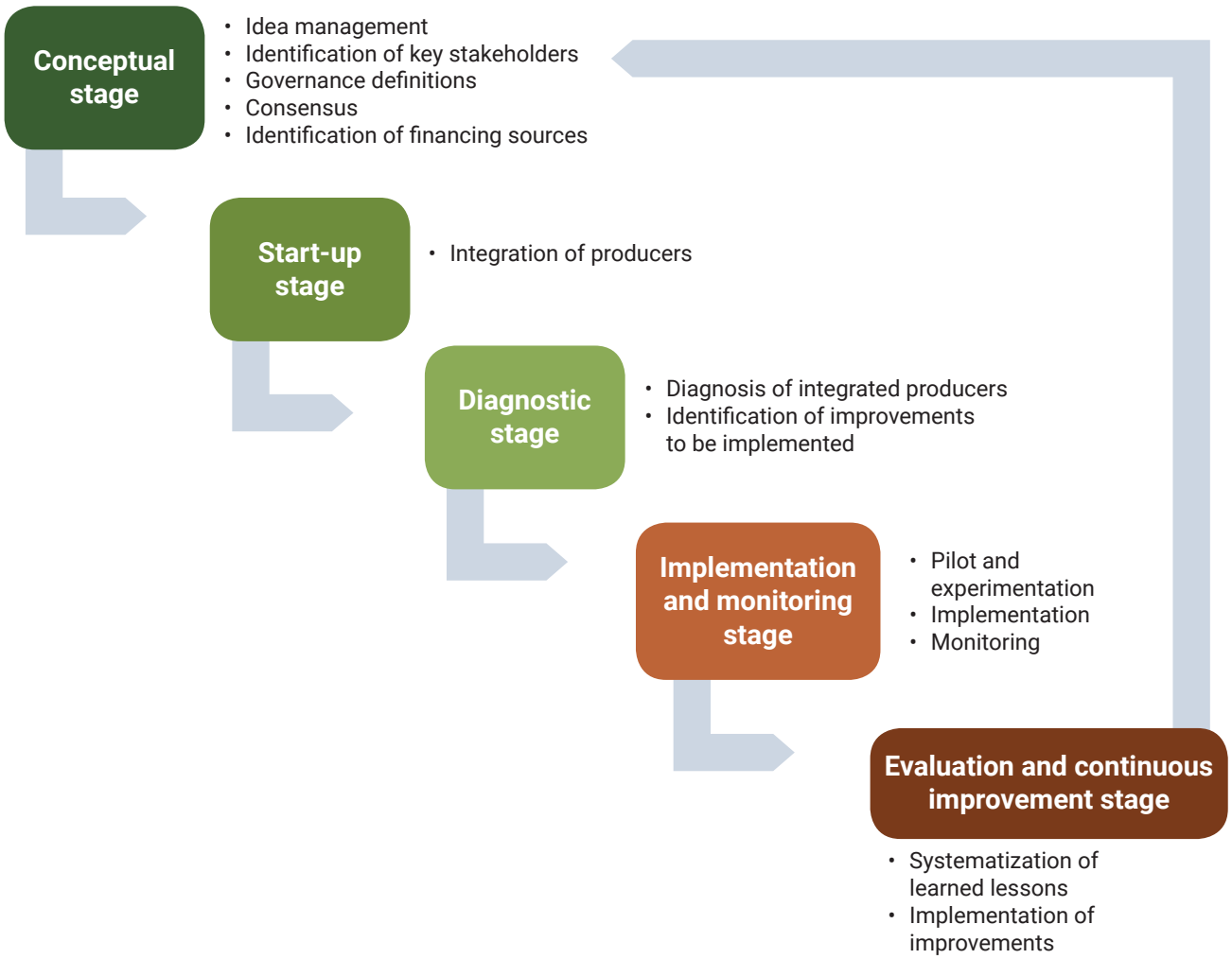


Figure 4. Stages of implementation of the Proposal for Sustainable Paraguayan Livestock Farming.

WHAT ARE THE BENEFITS OF THE PROPOSAL?

Livestock Sector

(a) generate technical/scientific information on nationally implemented production practices/models and their benefits to livestock sustainability, including the environment and climate.

(b) improvement of production efficiency and farm profitability.

(c) improvement of the livestock production image before the international community.

(d) improve the country's export profile.

(e) generate baseline information on the carbon neutrality of livestock production.

(f) international resource mobilization to strengthen the sector.

Academy

(a) generation of technical/scientific information that can serve as a basis for the initiation of multiple lines of research.

(b) mobilization of international resources to strengthen the sector.

Government

(a) technical/scientific information on the efforts implemented by the sector, to be included in multiple national reports.

(b) roadmap of upcoming activities to be prioritized to support the productive sector, mobilization of international resources to strengthen the sector.

WHO SHOULD BE INVOLVED?

- Ministry of Agriculture and Livestock (MAG)
- National Service for Animal Health and Quality (SENACSA)
- UGP (Association of Production Unions)
- ARP (Rural Association of Paraguay)
- CEA (Training and technology in the agricultural sector)
- CREA (non-profit civil association integrated and managed by agricultural entrepreneurs)
- FECOPROD (Federation of Production Cooperatives)
- Independent Producers
- Paraguayan Institute of Agricultural Technology (IPTA)
- National Forestry Institute (INFONA)
- Ministry of Environment and Sustainable Development (MADES)

HOW WILL IT BE FINANCED?

If there is consensus among the parties, for all activities that do not have funding, a proposal may be submitted to leverage international resources for cooperation; some of the possible sources of funding are: (a) Green Climate Fund (GCF)[3], (b) NAMA Facility[4] and (c) Global Environment Facility (GEF)[5].

Within the framework of the consensus process between the parties, the following will be decided: (a) the activities for which funding will be requested, (b) the source of funding, (c) the cooperation agency that will support the process.

[3] https://www.greenclimate.fund/

[4] https://www.nama-facility.org/

[5] https://www.thegef.org/