*Multidisciplinar (Montevideo)*. 2023; 1:70
doi: 10.62486/agmu202370
ISSN: 3046-4064

ORIGINAL

# Analysis of management practices and production sustainability

## Análisis de las prácticas de manejo y sostenimiento de la producción

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**Cite as:** Suarez Artunduaga JE, Sánchez Castillo V. Analysis of management practices and production sustainability. Multidisciplinar (Montevideo). 2023; 1:70. https://doi.org/10.62486/agmu202370

**Submitted:** 19-07-2023 **Revised:** 24-10-2023 **Accepted:** 22-12-2023 **Published:** 23-12-2023

**Editor:** Telmo Raúl Aveiro-Róbalo

**ABSTRACT**

Livestock activity in the department of Caquetá plays a crucial role in the economic development of the region and constitutes the main livelihood of rural households. Most of these Caquetá families are dedicated to raising cattle, focusing on the production of meat and raw milk to satisfy the demand of the processing industry and the regional, national and international market. However, the livestock models implemented for years in this region have tended to fail due to their extractivist nature, which transforms the landscape and displaces biodiversity, thus contributing to climate change variations. Although livestock reconversion projects have been developed, they have not been sufficiently effective due to the lack of information on the conditions of the productive units and the recognition of the actors and their identification with these processes. In view of these crucial information needs to improve livestock reconversion processes, our objective in this paper is to carry out an analysis of livestock production management and sustainability practices.

**Keywords:** Livestock Reconversion; Sustainable Production; Climate Change; Biodiversity.

**RESUMEN**

La actividad ganadera en el departamento del Caquetá desempeña un papel crucial en el desarrollo económico de la región y constituye el principal medio de vida de los hogares rurales. La mayoría de estas familias caqueteñas se dedican a la crianza de ganado bovino, enfocándose en la producción de carne y leche cruda para satisfacer la demanda de la industria transformadora y del mercado regional, nacional e internacional. Sin embargo, los modelos ganaderos implementados durante años en esta región han tendido al fracaso debido a su carácter extractivista, transformador del paisaje y desplazador de la biodiversidad, contribuyendo así a las variaciones del cambio climático. Aunque se han desarrollado proyectos de reconversión ganadera, estos no han sido suficientemente efectivos debido a la falta de información sobre las condiciones de las unidades productivas y el reconocimiento de los actores y su identificación con estos procesos. En vista de estas necesidades informativas cruciales para mejorar los procesos de reconversión ganadera, nuestro objetivo en este trabajo es realizar un análisis de las prácticas de manejo y sostenimiento de la producción ganadera.

**Palabras clave:** Reconversión Ganadera; Producción Sostenible; Cambio Climático; Biodiversidad.

## INTRODUCTION

Cattle raising in the department of Caquetá has been impactful since the colonization process; since then, it has become a cultural and economic tradition in families' lives.

A large part of Caquetá's soils are dedicated to livestock farming and many of these systems are extractivist

and extractive.

Some problems observed in extensive farming systems with little or no systematic arrangements include biodiversity loss, contamination of water sources, and low productivity.

The lack of information on these systems' state and conditions makes intervention measures unviable in precisely attacking their deficiencies. The lack of information on the state and conditions of these systems makes the intervention measures not viable in precisely attacking deficiencies. In this sense, the objective of this study is to make a diagnosis of the production system in the farm in the municipality of Albania Caquetá, which allows systematizing the weaknesses, strengths, and opportunities of the productive unit to be able to make concerted decisions that benefit the production system.

**Livestock in the world**

Livestock farming occupies 30 % of the planet's ice-free surface and, in several places, is the primary source of soil contamination and emission of nutrients, organic matter, pathogens, and pathogens waste from medicines into rivers, lakes and coastal areas. Animals and their excreta emit gases that contribute to climate change. Livestock shapes entire landscapes and reduces habitat (Pérez and Espejo, 2008), making it a significant growth with more than 1200 000 000 head of cattle. Its importance lies in its contribution to human food and nutrition and the economy of millions of families. According to FAO studies (2023), livestock activity is vital in the economy of around 60 % of rural households in developing countries, development pathway, which contributes to meeting the needs of about 1700 million people. As a phenomenon deeply rooted in the world economy, our planet faces difficult times of change.

Drastic changes in climatic factors put today's society in dire straits. Many of these environmental effects are attributed to the livestock industry, which is undoubtedly one of the most important drivers of climate change contributing activities. But the question today is not who pollutes more but rather what each sector of the world economy can do to minimize these changes. In this sense, the implementation of strategies such as intensive silvopastoral systems (SSPI), used in livestock farming as mechanisms to mitigate environmental impacts, has yielded good results. Results are, therefore, replicable in many parts of the world.

The use of intensive livestock production systems on an agroecological basis is seen as a strategic possibility to mitigate anthropogenic GHG emissions, among which the following are included intensive rational grazing systems, based on Voicin's postulates, based on several factors, such as no use of pesticides, stimulation of natural cycles, use of the grass at the optimum resting time and with sufficient root reserves to allow vigorous regrowth. In addition, the plant is used. When it has the nutrients to feed livestock, it maximizes the harvest of organic matter per unit area. It is managed with the carrying capacity in that space. This flexible management helps to eliminate the overgrazing and the disappearance of the cover of adapted species protect the soil and strengthen the root system, thus contributing to adaptation and mitigation (Martinez et al, 2019).

**Livestock in Colombia**

According to studies conducted by the Colombian Agricultural Institute ICA (2023). The country's cattle population is distributed in 620 807 farms and totals 29 642 539 animals, which represents an increase of 1,2 % compared to 2022. Similar to the previous year, 69,1 % of the total cattle population is concentrated in the same ten departments: Antioquia (11,1 %), Cordoba (8,1 %), Meta (8,1 %), Antioquia (11,1 %), and Córdoba (8,1 %) (7,8 %), Casanare (7,7 %), Caquetá (7,2 %), Cesar (5,7 %), Santander (5,7 %), Magdalena (5,7 %), Cundinamarca (5,1 %) and Bolívar (5,0 %).

In Colombia, it could be said that livestock activity has a high cost in environmental terms; the loss of forests, ecological imbalances, degradation, and contamination of soil and water sources seem to agonize more and more on account of livestock farming that grows along with the insatiable demand for raw materials of this origin. However, it is essential to highlight that for years, the little technification and planning of livestock production units has allowed an extensive extractivist activity of natural resources; however, thus, as in the rest of the world, it plays a vital role in the economy, so its eradication or decrease is a very distant case or perhaps impossible. According to Flórez (2018), the decrease in cattle ranching in Colombia is not feasible due to the development models proposed by the government. However, proposing sustainable alternatives to cattle ranchers and farmers that are compatible with the partial conservation of ecosystems, is one alternative and a challenge for farmers who must assume an essential role in the mitigation of environmental impacts, using tools or methodologies, the company has also developed strategic strategies such as silvopastoral systems, which positively affect agro-climatic factors, animal welfare, and improved production yields.

**Livestock in Caquetá**

Currently, in the department of Caquetá, there are approximately. 2 409 028 hectares are dedicated to cultivating pastures to satisfy the demand for forage for the feeding of approximately 1 180 470 cattle; these systems mainly present some degree of degradation, low fertility, low aeration, low biological activity, etc.

due to their traditional management. It should be noted that the raw materials from these production herds could result in low nutrition levels under these conditions. Caquetá is one of the most deforested departments in the world. The figures are truly shocking. Of the 16 municipalities that make up the municipality, eight (8) of them have more than 50 % of their land surface destined for pastures: Albania (98 %), Curillo (57 %), Paujil (58 %), El Doncello (51 %), La Montañita (63 %), Milán (69 %), Morelia (98 %), Solita (89 %).(Mora- Marín et al, 2017) This problem has been addressed and reviewed, but it is necessary to continue acting quickly with dynamic strategies that contribute to curbing deforestation and the imbalance that is created in agroecosystems; it is essential that livestock activity is planned according to the conditions of the territories, with livestock work routes focused on continuing with reconversion processes such as those that were carried out in the department in 2013 with the signing of an important initiative for the department called Pacto Caquetá, zero deforestation and livestock reconversion, in which the region's cattle ranchers sought to address deforestation and promote profitable and sustainable models, using dynamic strategies such as silvopastoral systems that would allow efficient use of the areas dedicated to cattle raising and return to the forest. Some already intervened soils that were in a vulnerable state, under different arrangements or by natural succession.

El Silencio Farm is a productive unit in which cattle ranching processes have been developed since 1969 since the colonization of this territory. This place has 37 hectares, which are distributed as follows 25 hectares in pastures, 7 in forests, 3 in natural recovery process, 1 in sugar cane cultivation, and 1 in corral facilities, house, and yard area. With a cattle herd of 25 animals, 6 of them in production with an average milk yield of 4 liters per day, this system has been developed conventionally for many years, thanks to the fact that there is an opportunity to initiate a process of transition of livestock towards a sustainable model but there is no clarity about the interest of its owners. The knowledge they have about this process, as well as the current conditions of the production system, to identify the shortcomings and the opportunities this area has for an effective livestock transition process. In this sense, this study aims to identify the current livestock production system at the El Silencio farm.

**Research question**

What is the current situation of the livestock production system on the El Silencio farm?

**Objective**

Analyze management practices and production sustainability.

## METHOD

*Location and Population:* the target population of this study is the producer of the livestock production system in the El Silencio farm located in the department of Caquetá, municipality of Albania, El Diviso.

*Methodological approach:* The present research is based on the paradigm of critical social research since it is based on a dialectical unity between the theoretical and the practical, which interprets and analyzes situations of social interest, as well as its commitment to social justice transformation (Alvarado and García, 2008).

*Type of research:* The research is descriptive because it broadly describes the situations that have occurred and are occurring in the productive system under study and the people involved in it.

*Focus:* The approach is qualitative because the interview tool was used to obtain information about the object of study.

*Method*

For the collection of information on the livestock production system on the farm, the silence was conducted in the following manner.

The collection of this type of data is based on the instrument for obtaining information through an interview in which a methodology of dialogue is developed between the interviewer and the interviewee (producer) in which a series of questions are asked that have been previously formulated to lead the interviewee to a specific topic, preventing them from taking another direction. Therefore, it is applied only to key informants and addresses aspects such as productivity, operation, difficulties, and future visualizations of the production system.

The interview was recorded before the interviewee's authorization. It will also be transcribed and analyzed, followed by data processing, description, and writing of the results obtained.

## RESULTS AND DISCUSSION

In this section, we present the results of the interview with the producer of the El Silencio farm, responsible for the management of the production processes carried out, respecting the current conditions of the livestock system.

**Producer perceptions regarding economic and financial factors of the livestock production unit**

In the narrative, the producer describes the situations he has perceived related to the economic and financial conditions of the livestock production unit, illustrated in figure 1. In this sense, the producer ratifies how the capitalization of his livestock project has been affected by the high costs derived from purchasing inputs at immeasurable prices. This has prevented productivity from increasing and, on the contrary, it has acquired a tendency to decrease. In this sense, Navas et al. (2009) indicate that, within the composition of the costs incurred by the farms, the costs of inputs occupy the largest share, and FNG (2021) ratifies that the main costs incurred by the farms are those related to the purchase of inputs.

The main drawbacks caused to the livestock sector in the last few years. These include the increase in the cost of agricultural inputs, increase in the cost of logistics services and the rise in the price of imported products.


**Figure 1.** Economic and financial conditions of the livestock system of the El Silencio farm

**Origins and dynamics related to the livestock system and the family**

The producer describes the situations The family has gone through the history and dynamics developed in implementing the system.

The livestock production system is described in figure 2.

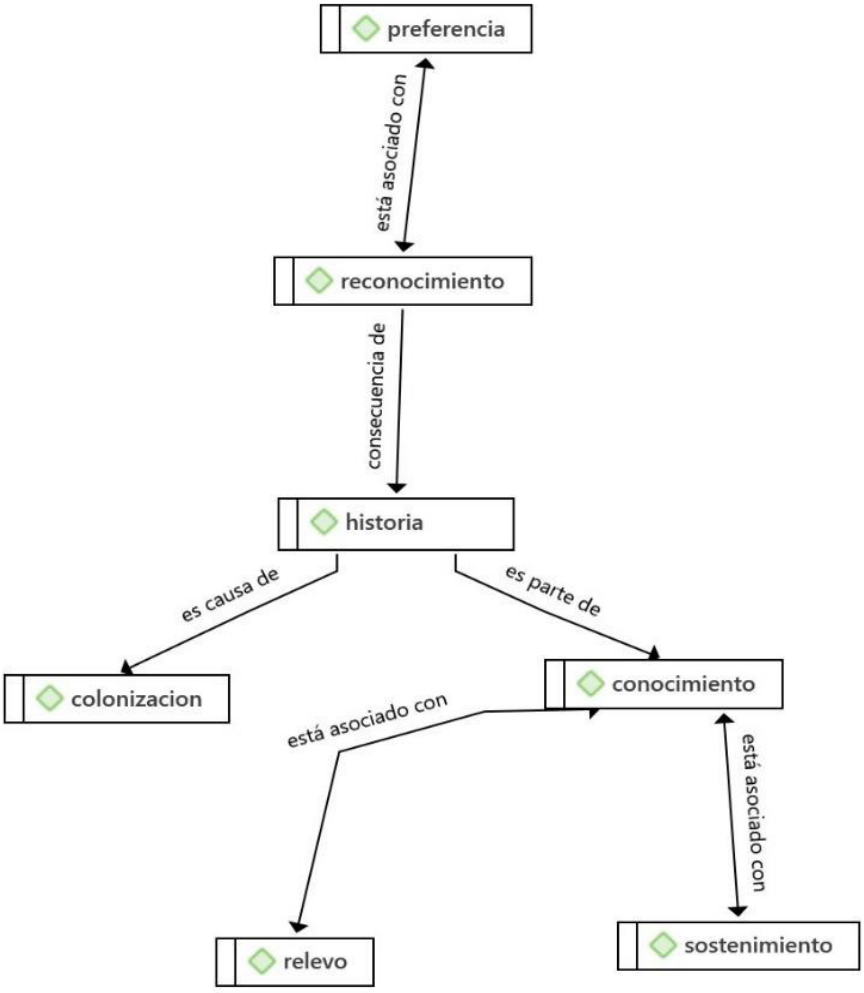


**Figure 2.** Human-family dynamics and their relationship with the livestock system

The property's history is associated with the processes of directed colonization promoted by the state. As well as the cattle-raising model that emerged from peasant colonization and the state-driven model. According to SINCHI. (2002), Caquetá had reached 1971, an initial stage of development based on extensive livestock production and agricultural production typical of colonization. However, the lack of knowledge regarding livestock management has hindered the process, according to Ramos et al. (2023). Knowledge, as a factor of production, is created from the interrelation of data, information, experiences, and values associated with the in this case, the farmer's knowledge is only empirical, a product of the generational relay he acquired from his father. Barbeta (2023) indicates that young farmers who have given continuity to the family farm have tended to rationalize and thus justify the succession process from an idea close to the livestock vocation. This gives us an understanding of how the behavior of the traditional management has been maintained during the last years the generations responsible for the livestock system. Based on the above situations, the producer has highlighted his commitment to improving the system through each of its components, including educating himself and applying production techniques and mechanisms.

The company's sustainable development will enable it to gain market preference and recognition among the region's farmers.

## CONCLUSION

The behavior and production dynamics carried out on the El Silencio farm have been mainly the product of traditional management, which indicates how these processes delay the system in terms of production, the low productivity, the high cost of inputs, and the low level of technification are some of the factors that have limited the productive yields of the system.

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## FUNDING

The authors received no funding for this research.

## CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

## AUTHOR CONTRIBUTION

*Conceptualization:* Jorge Enrique Suarez Artunduaga, Verenice Sánchez Castillo.
*Data curation:* Jorge Enrique Suarez Artunduaga, Verenice Sánchez Castillo.
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*Writing - proofreading and editing:* Jorge Enrique Suarez Artunduaga, Verenice Sánchez Castillo.