

Contribution of Silvopastoral Systems toward a Sustainable Livestock Farming in the Amazonian Foothills

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Background and Objective

- Silvopastoral systems (SPS) are multifunctional arrangements integrating crop, livestock, and forest.
- SPS have been adopted in tropical areas to improve animal welfare and to generate new economic, environmental, and climatic benefits.
- In Colombia, agricultural land has been predominantly used for the livestock sector.
- The Amazonian foothill, specifically the department of Caquetá had 8 % of cattle herds and was the fifth department for dairy production.
- It is particularly important to implement SPS to protect the Amazonian forest and to avoid extensive cattle ranching in this zone.
- This study analyzed the promotion of SPS as strategies for sustainable land management in order to identify economic, social, and environmental benefits, drivers and hinders factors, and negative externalities of them in the Colombian Amazonian foothills.**

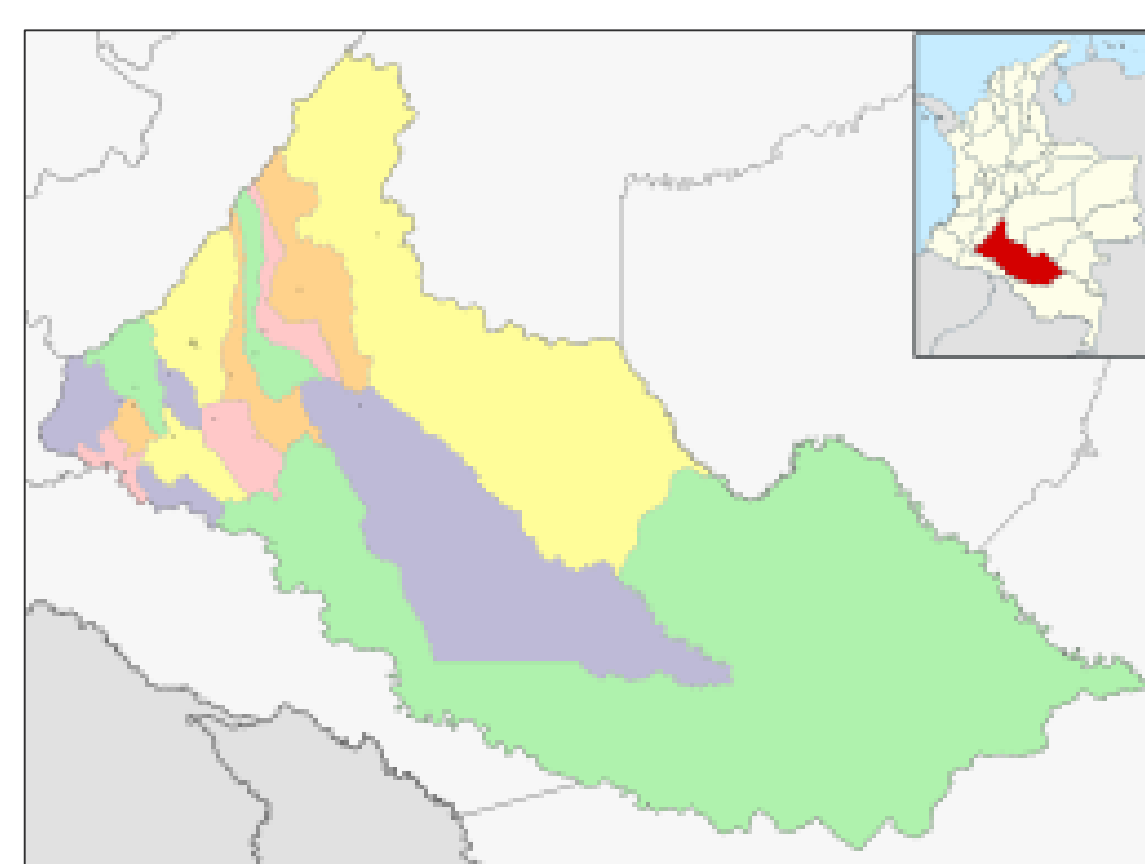


Figure 2: Map of Caquetá. © CC BY-SA 3.0, <https://commons.wikimedia.org/w/index.php?curid=17366499>

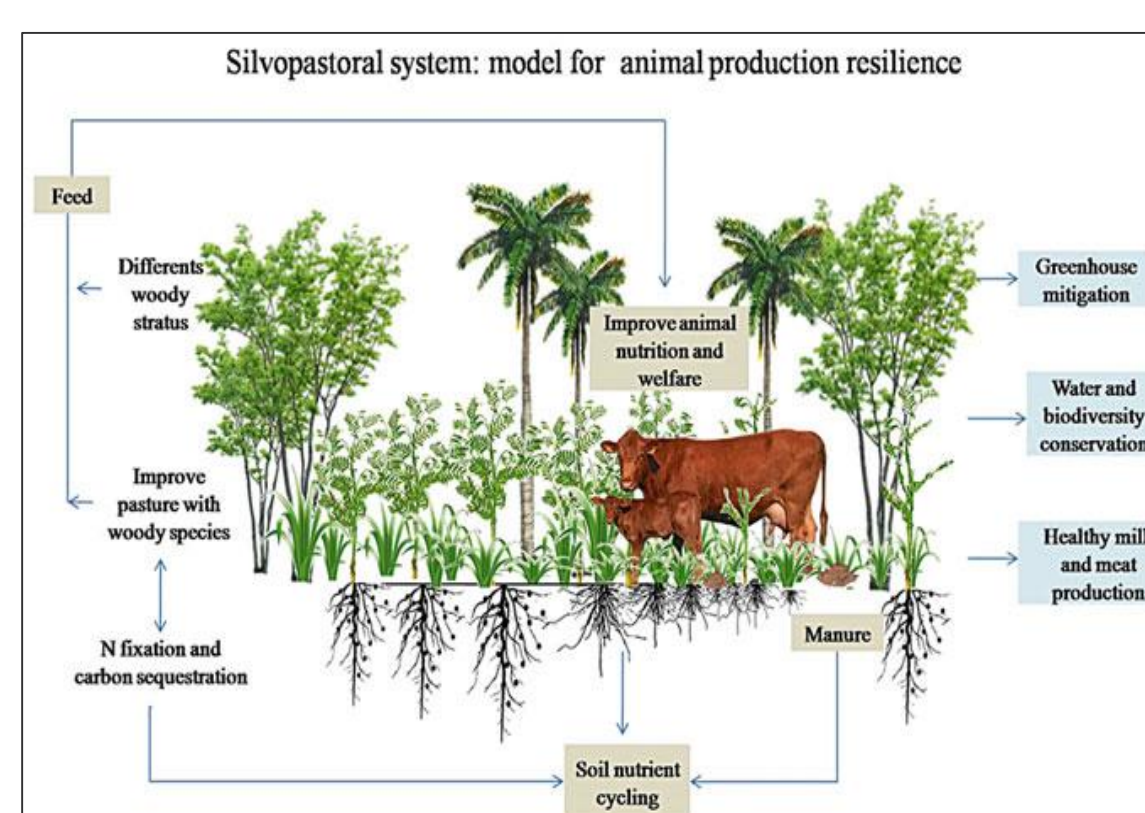


Figure 3: Model of silvopastoral systems for the resilience and the adaptive capacity to climate Change. © Solorio, S.F.J. et al. (2017)

Guiding questions for CA

- Project adoption status.
- Economic, social and environmental benefits of the implementation.
- Positive and negative external factors that may affect the project's scope.
- Negative externalities generated by the implementation.
- farmers' suggestions and advice for successful implementations.



© Martha Del Río. Cattle ranchers – Albania Caqueta.

Material and Methods

	Total Area ha	Land for Agricultural Use ha	% of total area	Fodder ha	Deforestation Land ha	Degradation by erosion
National	114,074,971	39,239,481	34.4%	22,946,697	192,175	40%
Caqueta Department	9,010,823 (7.9%)	1,484,010	16.5%	1,039,056	45,591 (23.7%)	22.6%

	Households depend on livestock	Heads of cattle	Cattle Production orientation		
			Dairy system	Mixed system (beef + milk)	Beef system
National	633,841	29,301,392	12.1%	45.2%	42.7%
Caqueta Department	20,737 (3%)	2,198,256 (8%)	4.6%	71.1%	24.4%

- Contribution analysis (CA) is a theory-based approach used to evaluate programs in complex and dynamic settings.
- CA focus on examining supportive conditions or alternative explanations which affect program achievement and outcomes.
- CA aims to demonstrate how a program is expected to achieve results.
- CA on SPS were developed with cattle farmers and other stakeholders in Caquetá using in-depth semi-structured interviews and two workshops (n=40).

Results

- Main Economic benefits of SPS are: better feeding for cattle, higher dairy production, greater diversification on the farm, higher farm economic valuation, lower loss of the herd.
- Main Social benefits of SPS are: Greater welfare and life quality for producers, community management of natural resources, new trainings and knowledge, social awareness of the importance of buffer zones and greater engagement of the ranchers with the farm.
- Main environmental benefits of SPS are: Efficiency in water use, greater availability of organic fertilizers and microorganisms, improved soil protection, landslide prevention, more shade, and less soil compaction.
- Positive driver: The empowerment of both, men and women to work together in the different tasks of this type of system.
- Hinder factors: The lack of resources to replicate the strategy in larger areas of the farm, the lack of livestock water supply systems, and shortages of electric fences and fuel needed to pump water to paddocks.
- Negative externality: Misappropriation of community resources such as water

References

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Conclusions

- The implementation of SPS strategy has had a boom in the region thanks to the fact that different projects have been aligned around this strategy. It is not the result of a single project.
- Livestock genetic breeding without good grassland management does not generate high profits.
- The sequence of implementation of the different SPS practices in each farm should be prioritized taking into account the particular needs of the farm.
- renewable energies are necessary for the proper functioning of the system.
- The silvopastoral arrangements generate more food for the cattle but also allow to recover the soil by establishing live fences and buffer zones.

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