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ORIGINAL

Analysis of the producer's social perception of silvopastoral systems and ecological connectivity

Análisis de la percepción social del productor acerca de los sistemas silvopastoriles y la conectividad ecológica

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ABSTRACT

This study was carried out in the village of El Roble, municipality of Florencia, department of Caquetá. The purpose of the research was to characterize the social perception of the producer about silvopastoral systems and ecological connectivity in the village, for which surveys, field visits and interviews were used as tools to collect information. A characterization of the perception of the producer who is interested in using a silvopastoral system as ecological connectivity was carried out, taking the field notes and the interview, the information was analyzed using atlas ti; an exploratory analysis (word cloud) and three deductive analyses were generated in which the producer expressed his knowledge and the interest in using the silvopastoral system as ecological connectivity was analyzed. The fact that the producer is interested in silvopastoral systems as ecological connectivity does not indicate that it will be implemented properly, therefore, a good accompaniment in the step by step of the productive transition supports the efficient management in which the environment will benefit.

Keywords: Silvopastoral System; Ecological Connectivity; Characterize; Analyze Exploratory Analysis; Deductive Analysis.

RESUMEN

El presente estudio se realizó en la vereda el roble, municipio de Florencia departamento del Caquetá. El propósito de la investigación fue caracterizar la percepción social del productor acerca de los sistemas silvopastoriles y la conectividad ecológica en la vereda, para lo cual se utilizaron encuestas, visitas de campo y entrevistas como herramientas de recolección de la información. Se realizo la caracterización de la percepción del productor que tiene interés de realizar un sistema silvopastoril como conectividad ecológica, tomando las notas de campo y la entrevista se analizó la información utilizando atlas ti; en él se generó un análisis exploratorio (nube de palabras) y tres análisis deductivos en el que el productor se plasmó su conocimiento y se analizó el interés al recurrir al sistema silvopastoril como conectividad ecológica. El hecho que el productor se encuentre interesado en los sistemas silvopastoriles como conectividad ecológica no indica que se implementara adecuadamente, por lo tanto, un buen acompañamiento en el paso a paso de la transición productiva respalda la gestión eficiente en el que se beneficiara el medio ambiente.

Palabras clave: Sistema Silvopastoril; Conectividad Ecológica; Caracterizar; Analizar Análisis Exploratorio; Análisis Deductivo.

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INTRODUCTION

The growth of the provision of ecosystem, environmental, and social services is damaging the world's forests.[1] Conserving our planet's biodiversity is a global concern. Colombia ranks second with the highest diversity of flora and fauna and is one of the 12 megadiverse nations in the world.[2] However, this is followed by the extension of anthropic activities and population growth that modify nature. Its leading cause is extensive livestock farming, but fortunately, there are alternatives to improve agricultural systems, such as silvopastoral systems, to have a farming production that benefits the environment.[3]

The Amazon region lost 54 460 hectares in 2022, a very high rate compared to other regions; however, deforestation in Colombia was 45 000 hectares for the same year.[4] Deforestation has caused certain fauna species to be lost.[5] Extensive cattle ranching is Colombia's leading cause of deforestation, with 174 113 hectares, affecting the ecosystem that supplies water resources and wildlife habitat.[6]

At the departmental level, Caquetá has a great diversity of 982 birds and has many endemic species,[7] but Caquetá is being deforested in a total of 41,9kha of native forest,[8] extensive cattle ranching or logging are the leading causes of deforestation in the department.[9] According to a study in his booklet the participatory design in Caquetá has been carried out from the planning of farms, to optimize its components, i.e. its productive areas, water, soil, infrastructure and forest connectivity with this has been intended to improve the quality of life in the rural sector and collaboration with the DNP and MVA, (2016) has generated a manual for sustainable livestock farms in the department of Caquetá as a strategy for landscape connectivity in silvopastoral systems uses.

The Silencio property, located in the village of El Roble, has 80 hectares, of which 14 hectares are forest. Only 82 % of the area is used for livestock, corn, cassava, banana, avocado, and sugar cane. This has resulted in a low forest percentage, reducing wildlife and ecological connectivity corridors. Therefore, it is essential to establish silvopastoral systems to connect to the landscape and ensure that other wildlife benefits the ecosystem.

The information collected was used to analyze and identify the criteria regarding the producer's social perception, taking into account that the development of a silvopastoral design strengthens the farm's ecological connectivity.

METHOD

Study location

This study will be carried out in the El Orteguaza district, in the El Silencio property at coordinates 1.71388" N 75.52342" W, located in the El Roble trail, in the municipality of Florencia, in the department of Caquetá (figure 1). The farm has 80 hectares, of which 14 are in native forest; the rest is planted with banana, corn, yucca, sugarcane, and pasture. In addition to livestock and poultry farming, on the property live five people: the father of the family, the mother, and three young people.

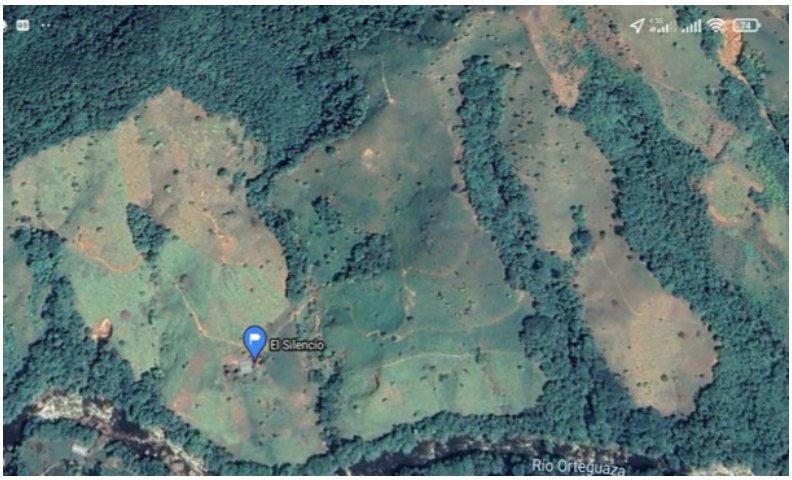

Figure 1. Map of the El Silencio property, El Roble village (2017)

The participant in this research is the father of a family that has been a traditional cattle rancher for 12 years. He wishes to improve his agricultural system by opting for agroecological practices such as the silvopastoral system as a strategy of connectivity to the landscape.

The type of design is participatory, because its main objective is related to the criteria that must be taken into account to develop a participatory silvopastoral design to strengthen the ecological connectivity of the property and participatory research is a method of social research that investigates the full participation of society in the analysis of its reality in order to elicit the social participation of the research participants, according to De Witt et al.[10].

Methodological Approach

The present design is based on the social-critical paradigm, since the study to be developed is not exclusively descriptive of reality, but advocates a proposal to transform it. Following Habermas[11], this paradigm means the possibility of understanding and inferring reality as practice by orienting knowledge towards autonomy and social empowerment, and involving participants through consensual decisions transformed from within.

The research model is participatory, because its central objective is related to the criteria that must be taken into account to develop a participatory silvopastoral design to strengthen the ecological connectivity of the farm and participatory research is a method of social research that investigates the full participation of society in the analysis of its reality in order to elicit the social participation of research participants, according to De Witt.[10]

The approach is qualitative because data production will use qualitative instruments, so no generalizations will be produced, nor will numerical variables be addressed, to understand the different customs, habits, affections, and ideas, among other things. This research is frequently used in education and sociology, as it helps to analyze the facts, decipher them, and know how to act.[12]

The first thing that was done was to conduct the relevant interview with the key informant to understand the operation of the farm using information from the producer, and then proceed to transcribe the interview into Word. The various comments were made using the keywords in the Microsoft Word platform, and the document was printed. After this, the plain text without any comments was passed through Atlasti_9. The most important phrases were selected, then a code was assigned to each class that were made in Word, and then the networks referring to the work were made, separating the codes by families which were related, each family was a network, in total three networks came out, in the next step the word cloud was made in which the words without significant relevance were removed, Finally, the Sankey diagram was made in which some codes that were of minor importance were removed, and those that were repeated the most were left, taking as a reference a code that should be intertwined with the rest of the codes in order to produce the diagram, with these data the description of the findings was made and finally the triangulation of the results.

RESULTS AND DISCUSSION

The correlation between the main characteristics of the social perception of the cattle ranchers around the silvopastoral systems was analyzed during the observation.

The silvopastoral system is a conservation alternative for the environment and a landscape connectivity relationship that serves as ecological corridors with the proper accompaniment of the producer in order to improve their extensive livestock and obtain greater benefits (figure 2). However, vegetation is being destroyed to form pastures and conventional agriculture, increasing gas emissions. Therefore, it is important to conserve and plant pastures, timber, and associated shrubs that allow soil fertility and preserve biodiversity synchronously with the ecosystem, allowing a long ecosystemic benefit. Good management should be considered relevant to have pasture presence to obtain an optimal development of protein for livestock (figure 2).

The connectivity of landscapes is of importance because it conserves species diversity and are called forest patches[13] and is one of the movement of animals in search of their food, shelter and habitats, if embarco plants are scarce species and many are not suitable for some soils and thanks to seed dispersing animals can conserve certain trees.[14]

Figure 2. Word cloud

Deductive analysis (network)

Within the findings on the social perception of livestock farmers about silvopastoral systems, it was possible to identify about 27 codes of interest, which were grouped into 3 families of analysis:

Technical - productive family

For the producer, a silvopastoral-SSP system requires a considerable investment, which depends, among other things, on the conditions of access to the property, since it is necessary to transport seeds and other inputs to the destination site. Among the advantages that the producer considers that the implementation of SSP (silvopastoral systems) brings with it, is the greater availability of forage or feed, fresh and highly palatable for the animal. In addition to other benefits such as shade that generates a comfortable environment, which indirectly affects animal performance (figure 3).

The result of the shady areas helps the efficiency of cows in terms of milk production, tolerating less heat, due to its high metabolism[15] shady areas benefit the performance in a farm, in terms of forage production and grazing for cattle.[16] In the morning and afternoon hours are cooler so they go out to graze and ruminate, then they are located in areas with good trees to start the

ruminating process and produce metabolism at the time of fermentation.[17]

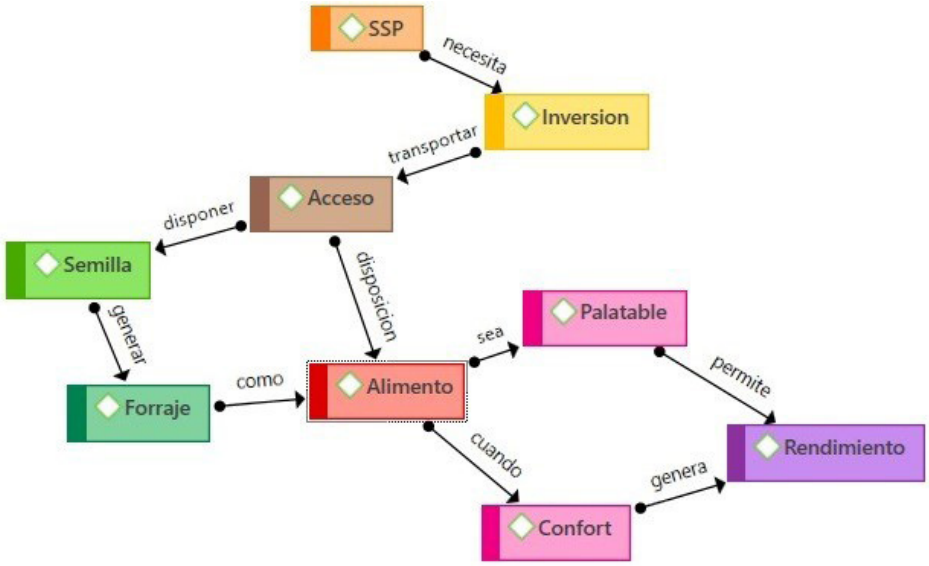

Figure 3. Production technician

Family social perception

The farmer is interested in silvopastoral systems, but requires a good technical-productive accompaniment that associates the SSP, allowing him to receive instructions to apply a system where environmental coexistence is one of the priorities for the purpose, and that provides stability to the farm, reduction and mitigation of environmental deterioration (figure 4).

Secondary forests are the source of food for livestock. Most farmers are based on empirical knowledge which has led them to manage their farms in more environmentally friendly practices and thus receive a benefit for implementing a silvopastoral system[18] for the farmer the biggest obstacle is the economy, because running this system can reach very high costs (figure 4).

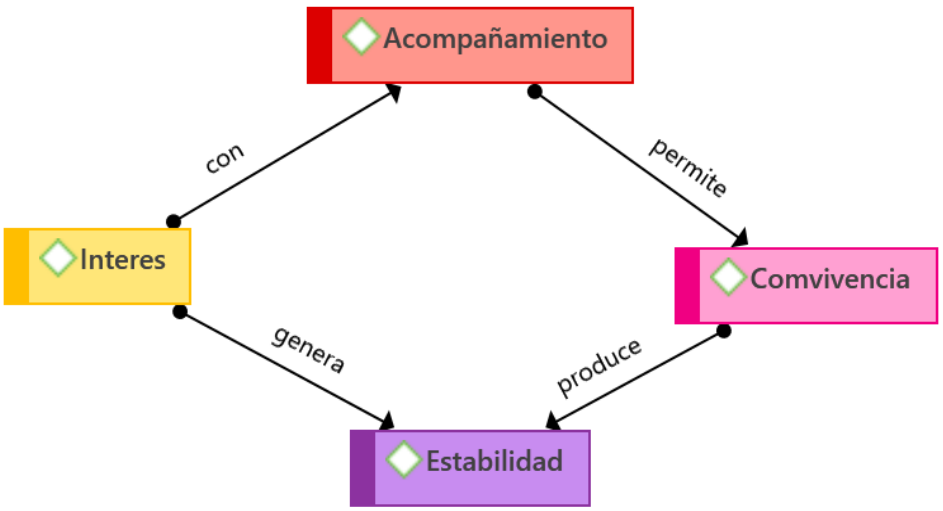

Figure 4. Social perception

Environmental family

Protection is important because protecting the relief triggers a myriad of interactions that are associated with the preservation of the landscape, being one of the ways to naturally conserve the varieties of trees that harbor and are distributed within the unique and wonderful diversity of the landscape. This would keep the fauna and flora in ecosystemic balance (figure 5).

The protection starts from the understanding that it is required to ignore its meaning and starts from the relationship that has in the peasant system to preserve the ecosystemic systems generating the existence of harmonious association that unites societies and nature inducing environmental balance and conservation is the position that strengthens the relationship of the forest and direct and indirect dynamics.[19]

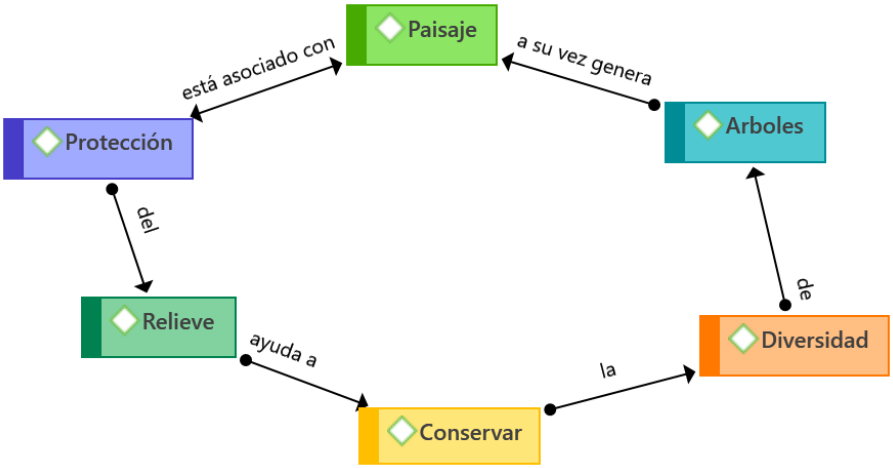

Figure 5. Environmental

CONCLUSIONS

The social perception allows us to collect useful information to be analyzed through participatory methods, by providing recognition of the area to be developed, it is directed to identify common and ordinary problems, contributing in beneficial collaboration, the use of concerted and conciliated processes generates that social projections solve and mitigate problems or contribute to larger problems. It is proposed that the research be continued in order to see results in the technical-productive transition that allows the follow-up and evaluation of the scope of the benefits, it is expected that the research will be a participant in providing support to future research

FINANCING

None.

CONFLICT OF INTEREST

None.

AUTHORSHIP CONTRIBUTION

Conceptualization: Brandon Alexis Cuellar Artunduaga, Verenice Sánchez Castillo.
Data curation: Brandon Alexis Cuellar Artunduaga, Verenice Sánchez Castillo.
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REFERENCES

1. Paquette A, Messier C. The Role of Plantations in Managing the World's Forests in the Anthropocene. Front Ecol Environ. 2010;8.

2. GOV.CO. Colombia, el segundo país más biodiverso del mundo. Minciencias. 2016. https://minciencias.gov.co/sala_de_prensa/colombia-el-segundo-pais-mas-biodiverso-del-mundo

3. Cajas-Giron YS, Sinclair FL. Characterization of multistrata silvopastoral systems on seasonally dry pastures in the Caribbean Region of Colombia. Agrofor Syst. 2001;53(2):215-25.

4. Rodriguez DK. La deforestación en Colombia subió 11 % en el primer semestre de 2022. Portafolio.co. 2022. https://www.portafolio.co/economia/finanzas/deforestacion-en-colombia-como-esta-el-pais-en-2022-571261

5. Daily GC, Ceballos G, Pacheco J, Suzán G, Sánchez-Azofeifa A. Countryside Biogeography of Neotropical Mammals: Conservation Opportunities in Agricultural Landscapes of Costa Rica. Conserv Biol. 2003;17(6):1814-26.

6. Cabra AL. Ganadería extensiva, uno de los motores de la deforestación en Colombia. 2022. https://acortar.link/j7C2cU

7. Prensa Instituto Humboldt. Cauca, Nariño y Antioquia, los departamentos con más aves en Colombia. 2021. http://www.humboldt.org.co/es/boletines-y-comunicados/item/1599-cauca-narino-y-antioquia-los-departamentos-con-mas-aves-en-colombia

8. Espectador E. La deforestación en Meta, Guaviare y Caquetá está fuera de control. ELESPECTADOR.COM. 2020. https://

www.elespectador.com/ambiente/la-deforestacion-en-meta-guaviare-y-caqueta-esta-fuera-de-control-article/

9. Plaza GP. ¿Porque se pierden los bosques en Caquetá?. PID AMAZONIA. 2020. https://pidamazonia.com/content/%C2%BFporque-se-pierden-los-bosques-en-caquet

10. De Witt, Gianotten V. Investigación participativa en un contexto de economía campesina (Holanda). In: La Investigación participativa en América latina. México: CENAPRO; 1988.

11. Habermas J. La teoría de la acción comunicativa, complementos y estudios predios. Madrid: Cátedra; 1994.

12. Solís LDM. El enfoque cualitativo de investigación. Investigalia. 2019. https://investigaliacr.com/investigacion/el-enfoque-cualitativo-de-investigacion/

13. Bordino J. Conectividad ecológica: Definición, características e importancia. 2022. https://www.ecologiaverde.com/conectividad-ecologica-definicion-caracteristicas-e-importancia-3703.html

14. Mancebo YR. La conectividad del paisaje y su importancia para la biodiversidad. 2019. https://www.sabermas.umich.mx/

secciones/articulos/526-la-conectividad-del-paisaje-y-su-importancia-para-la-biodiversidad.html

15. Weston RH. Animal factors affecting feed intake. In: Hacker JB, editor. Nutritional Limits to Animal Production from Pastures: Proceedings of an International Symposium Held at St. Lucia, Queensland, Australia, August 24-28, 1981. 1982.

16. Betancourt K, Ibrahim M, Harvey CA, Vargas B. Efecto de la cobertura arbórea sobre el comportamiento animal en fincas ganaderas de doble propósito en Matiguás, Matagalpa, Nicaragua. Agrofor Am. 2003;10(39-40).

17. Navas A. Importancia de los sistemas silvopastoriles en la reducción del estrés calórico en sistemas de producción ganadera tropical. Rev Med Vet. 2010;19:113-22.

18. Ortiz PN, Alayón JA. Percepción social de servicios ambientales en sistema silvopastoril de pequeños ganaderos en Campeche. Av Investig Agropecu. 2021;25(3).

19. Silvetti F. Una revisión conceptual sobre la relación entre campesinos y servicios ecosistémicos. Cuad Desarro Rural. 2011;8(66).