Corazón de la Amazonía

Conectando la biodiversidad con el uso sostenible

Ecological connectivity of the Colombian Amazon landscape

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Performance and Sustainability Modeling Program

Objectives

I.Formulate a standardized methodology for conducting ecological connectivity and landscape fragmentation studies, with emphasis on the drivers of fragmentation, at three different geographic scopes (regional, subregional and local).

II. Validate the methodology proposed at the regional level in the Colombian Amazon.

Identify and spatialize:

a. Fragmentation processes in the Colombian Amazon and associated variables.

b. Drivers of fragmentation at the regional scale in the Colombian Amazon.

c.Areas that are crucial for the maintenance of ecological connectivity between the Colombian Amazon and adjacent regions.

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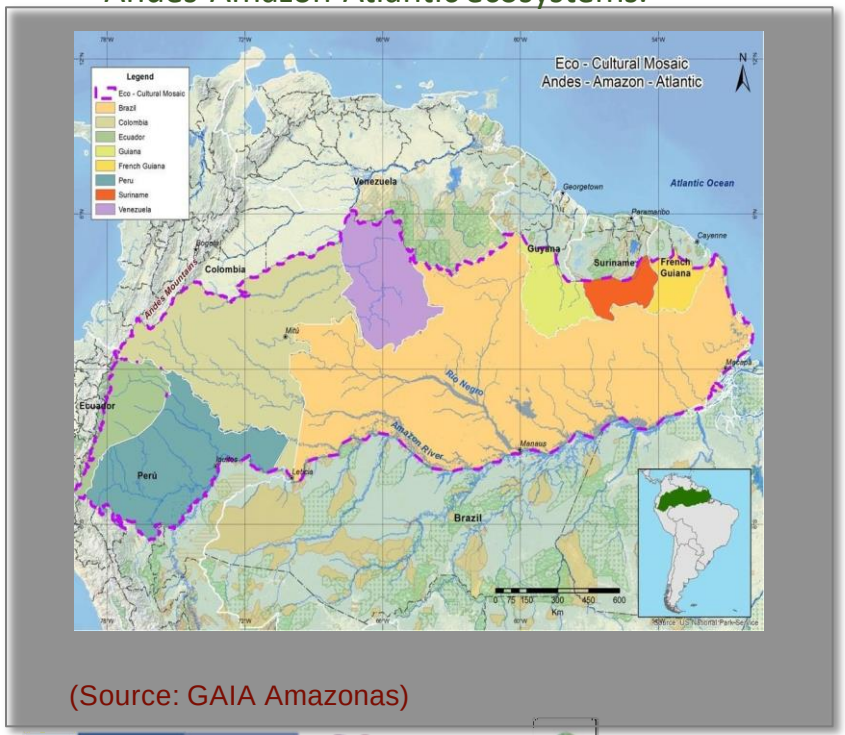
Background

The AAA Corridor

- Macro-regional initiative
- Aerial rivers, maintenance of the hydrological cycle.
- Restore and maintain connectivity between the Andes-Amazon-Atlantic ecosystems.



(Source: GAIA Amazonas)

- Biological corridors in the Colombian Amazon: Current status, threats and connectivity". ECLAC/Natural Heritage 2012
- Synthesis of advances and case studies in the identification and analysis of deforestation drivers in the Colombian Amazon. SINCHI 2016
- Guidance for reducing deforestation and forest degradation: Example of the use of deforestation drivers studies in territorial planning for the Colombian Amazon. GIZ; SINCHI, 2016

Project Location

COLOMBIAN AMAZON
AMAZONIA COLOMBIANA

- Surface area: 483,164 km2
- They represent 42.3% of the national continental area.
- 23.3% total Colombia.
- 6% of the entire greater Amazon.

I. Methodology for the study of fragmentation and fragmentation engines.

1

Fragmentation

- Fragmentation Index
- Structural Analysis (patterns)
- Identification of variables

Fragmentation Engines

- Characterization of determining factors, agents and causes.
- Characterization and spatialization of fragmentation engines.

3

Connectivity

- Species habitat modeling
- Resistance matrices
- Source areas
- Modeling of connectivity corridors (least cost corridors).

Characterization of Corridors

Prioritized corridors

Three areas of geographic scope:

- Regional
- Subregional
- Local

Supplies and Software

1 Fragmentation

- Polygon study area
- Land cover
- Guidos (Vogt & Riitters, 2017;)
- Fragmentation index layer
- ArcGis-Fragstast

2 Fragmentation Engines

- Units of analysis
- Bibliography (plans, programs, policies).
- Legal Status of the Territory
- Agricultural Frontier
- Population density in intervened area.

3 Connectivity

- Habitat and species presence.
- Land cover layer
- Environmental variables.
- MaxEnt ®
- Resistance matrices:
- CircuitScape
- LinkageMapper ®
- ArcGis® GUIDOS

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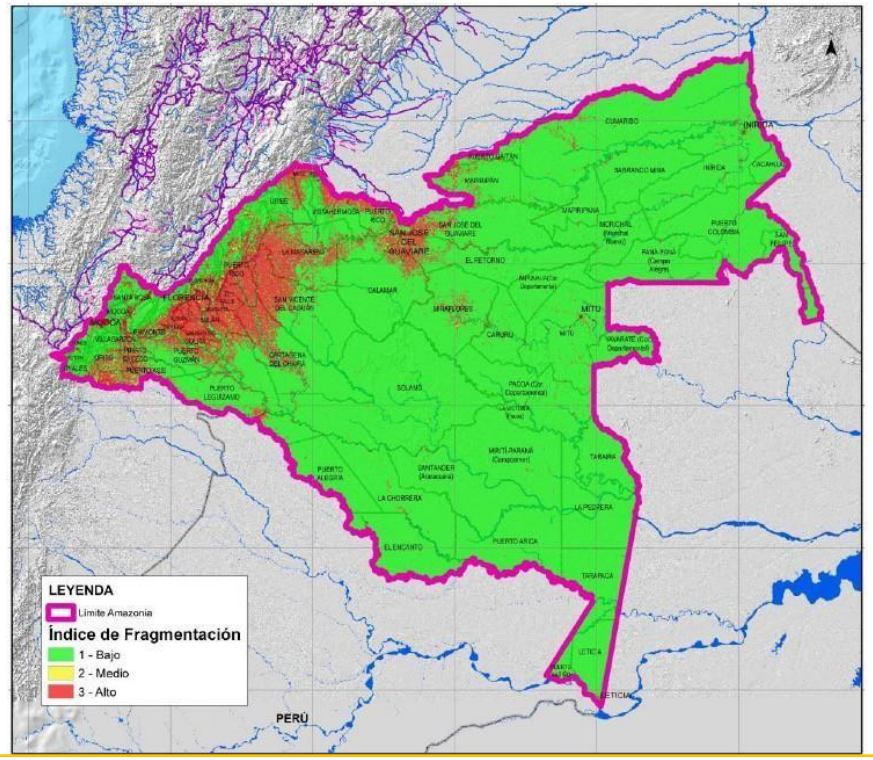
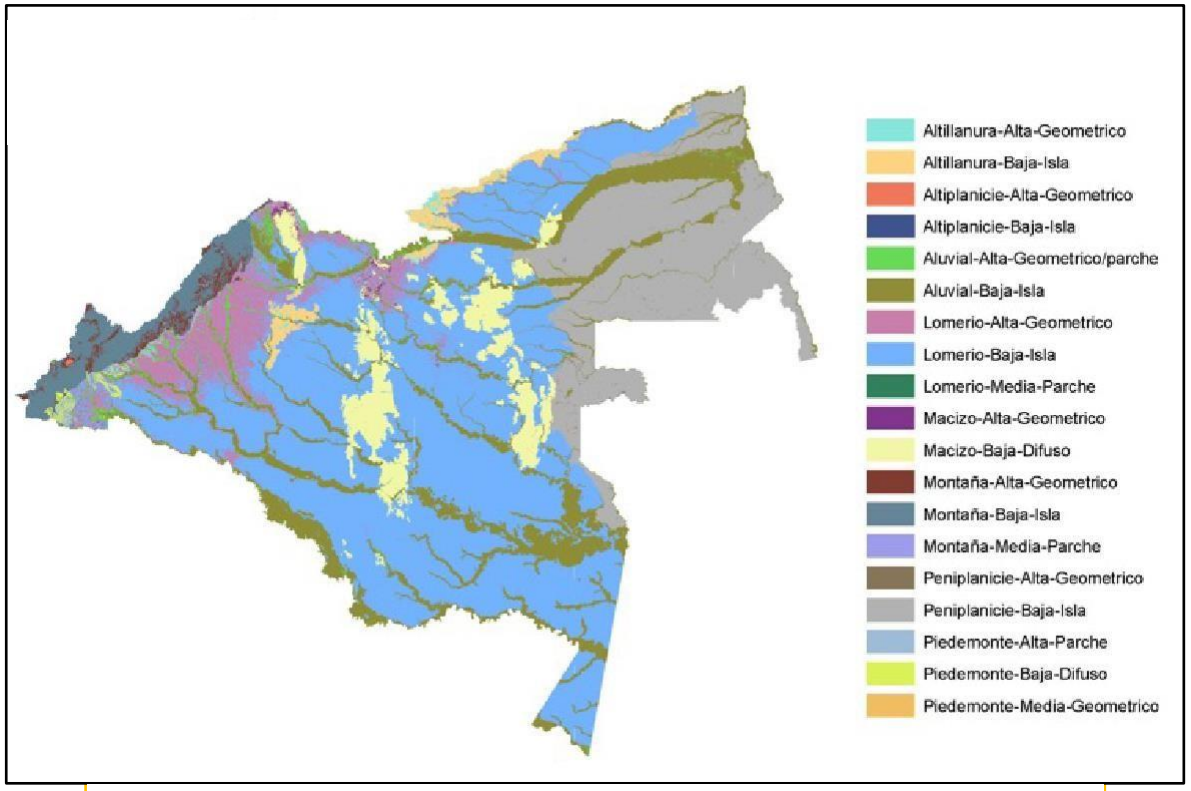
IIa. Fragmentation processes in the Colombian Amazon and associated variables.



Spatial representation of the Fragmentation Index in the Colombian Amazon.
Source: SINCHI 2020.



Spatial representation of the Fragmentation Index associated to physiographic unit and fragmentation pattern.
Source: SINCHI 2020.

Heart of the **Amazon**

Connecting biodiversity with sustainable use

IIb. Drivers of fragmentation at the regional scale in the Colombian Amazon.

I- Land concentration

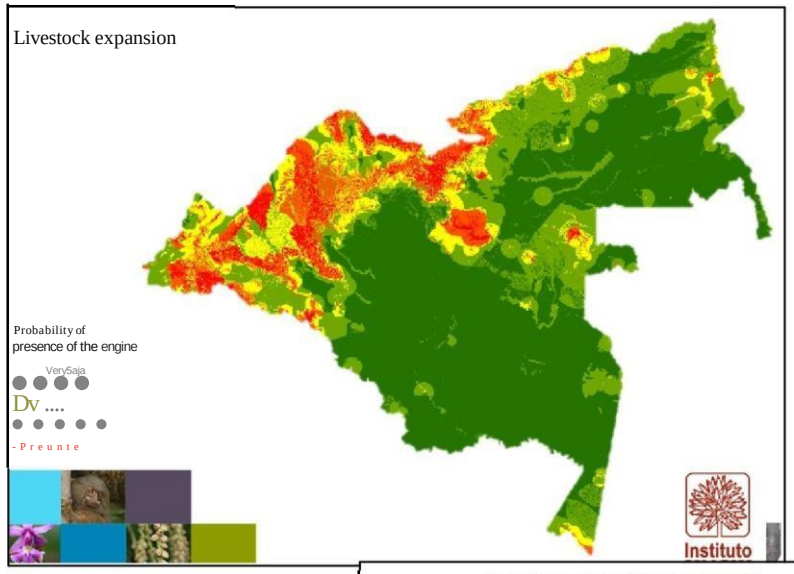
! Expansion of the agricultural frontier

1-W ! Livestock Expansion

Construction, improvement and expansion of road network

I-A Exploration of mineral and energy resources

I- incidence and expansion of illicit crops



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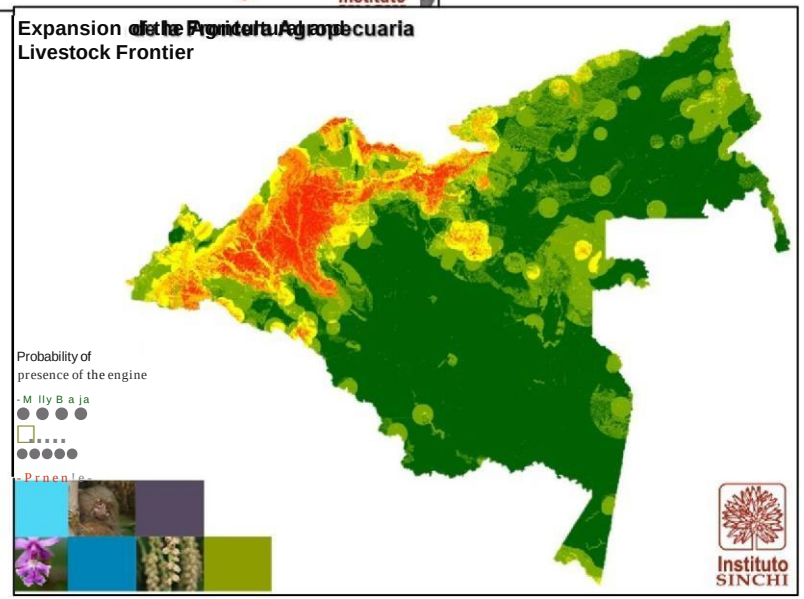

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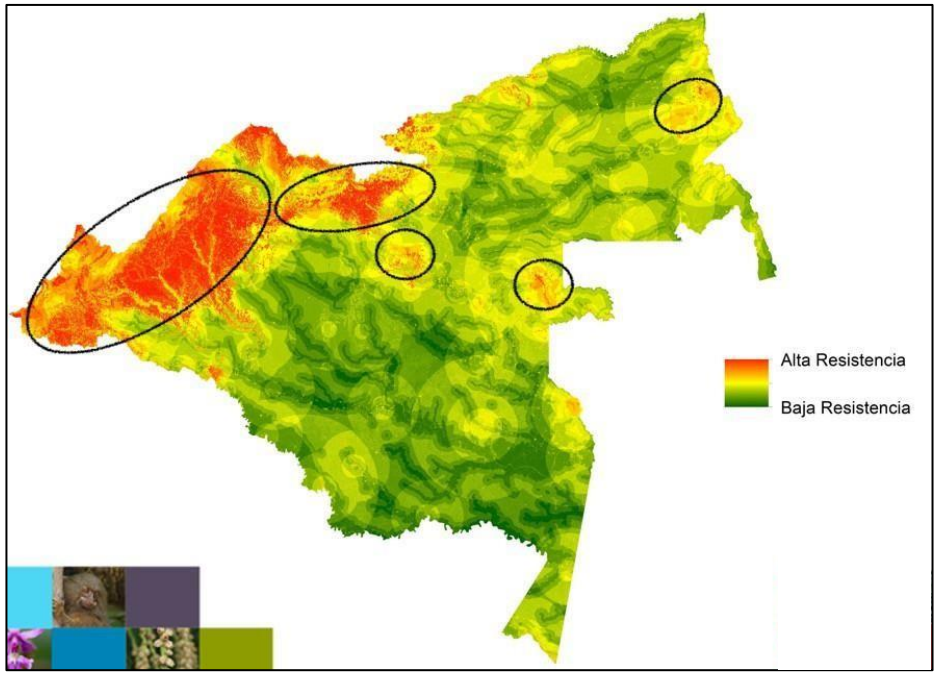
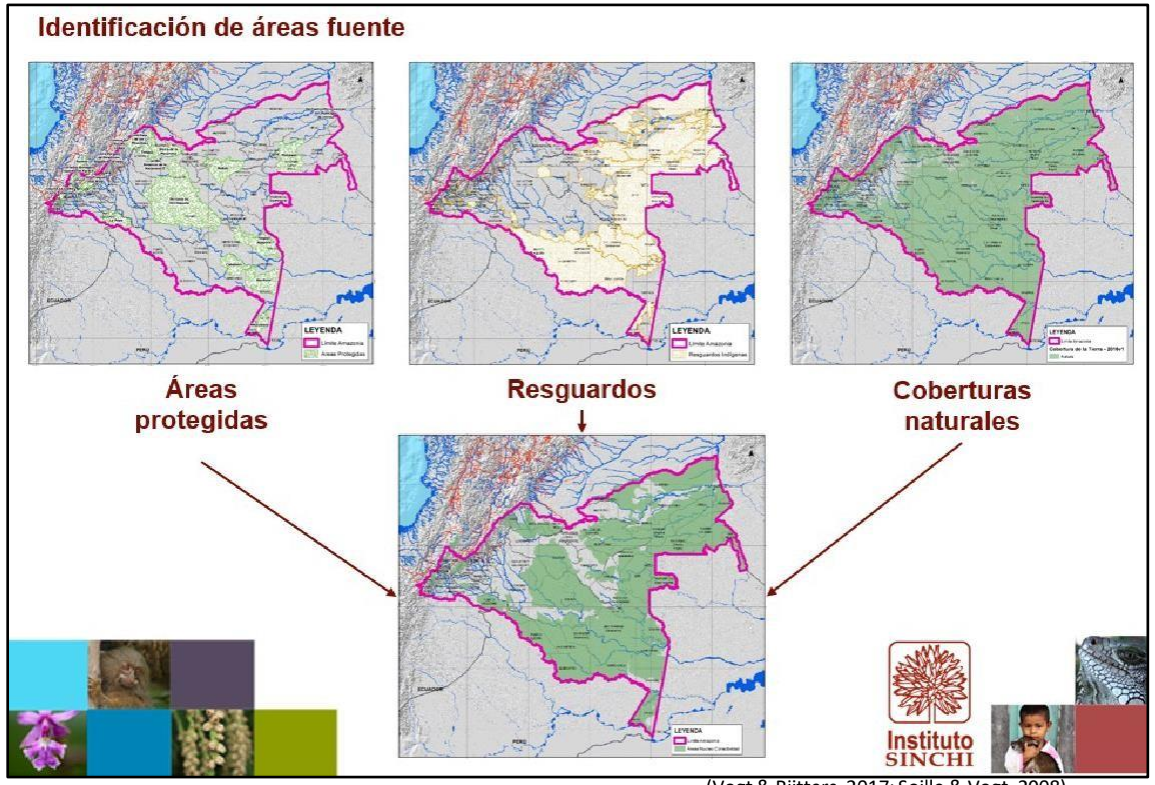
IIc. Areas that are determinant for the maintenance of ecological connectivity between the Colombian Amazon and adjacent regions.



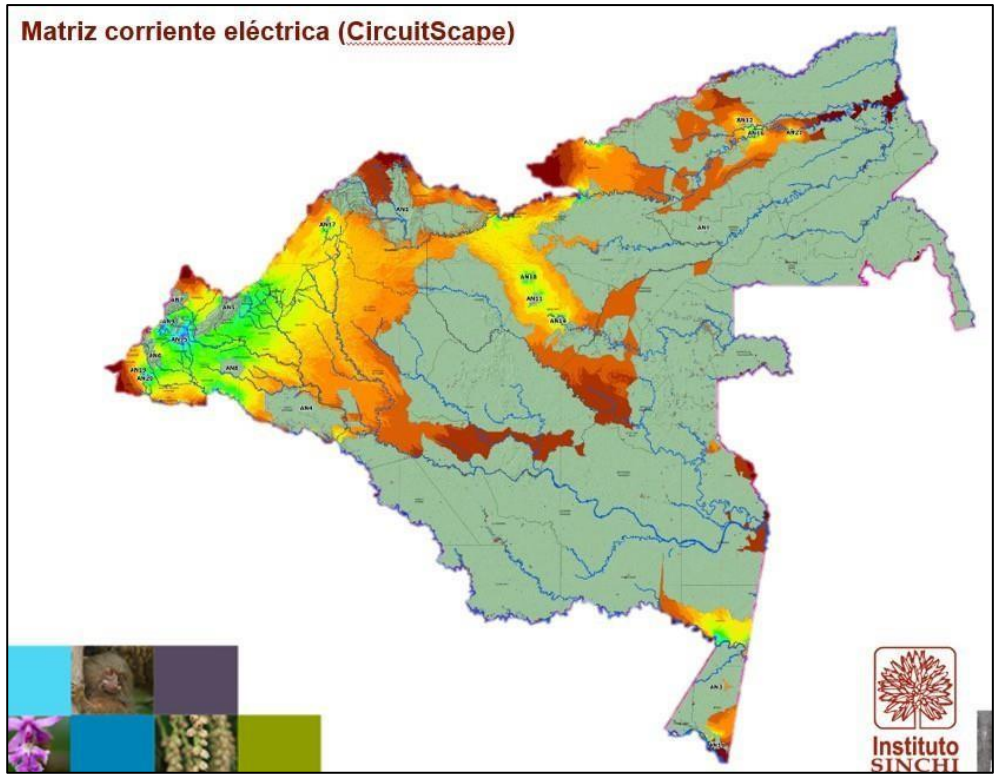
Resilience Matrix corresponding to the Spatial Human Footprint Index (HFI).
Source: SINCHI 2020



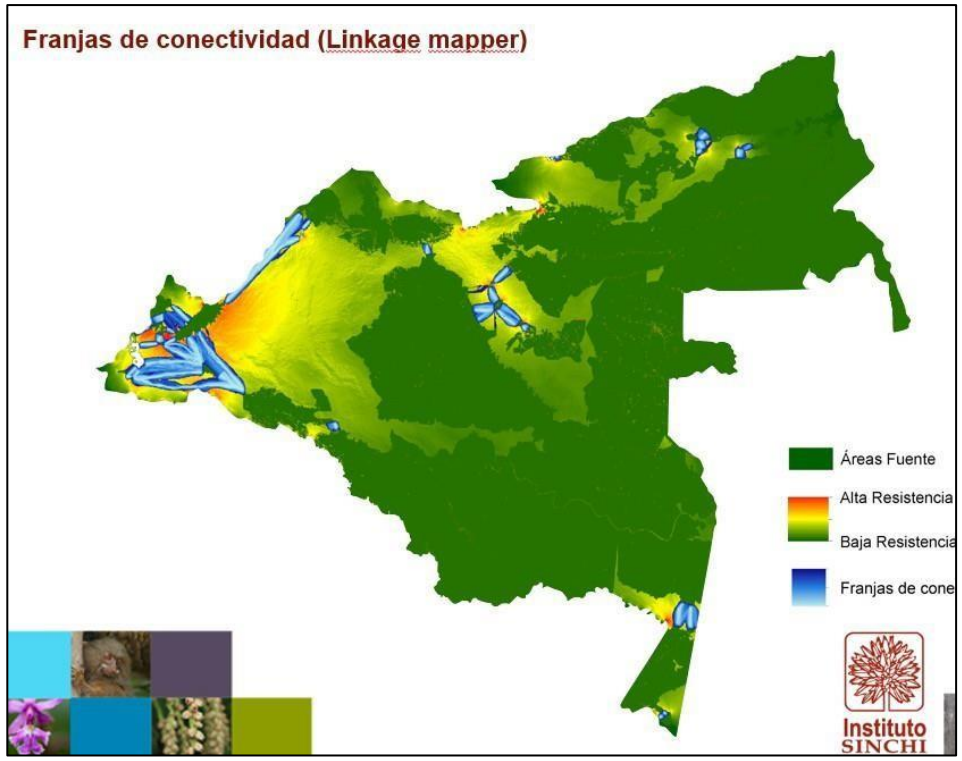
(Vogt & Riitters, 2017; Soille & Vogt, 2008).

Source areas for connectivity
Source: SINCHI 2020

IIc. Identification and spatialization of key areas for the maintenance of connectivity between the Colombian Amazon and adjacent regions.



Source: SINCHI 2020

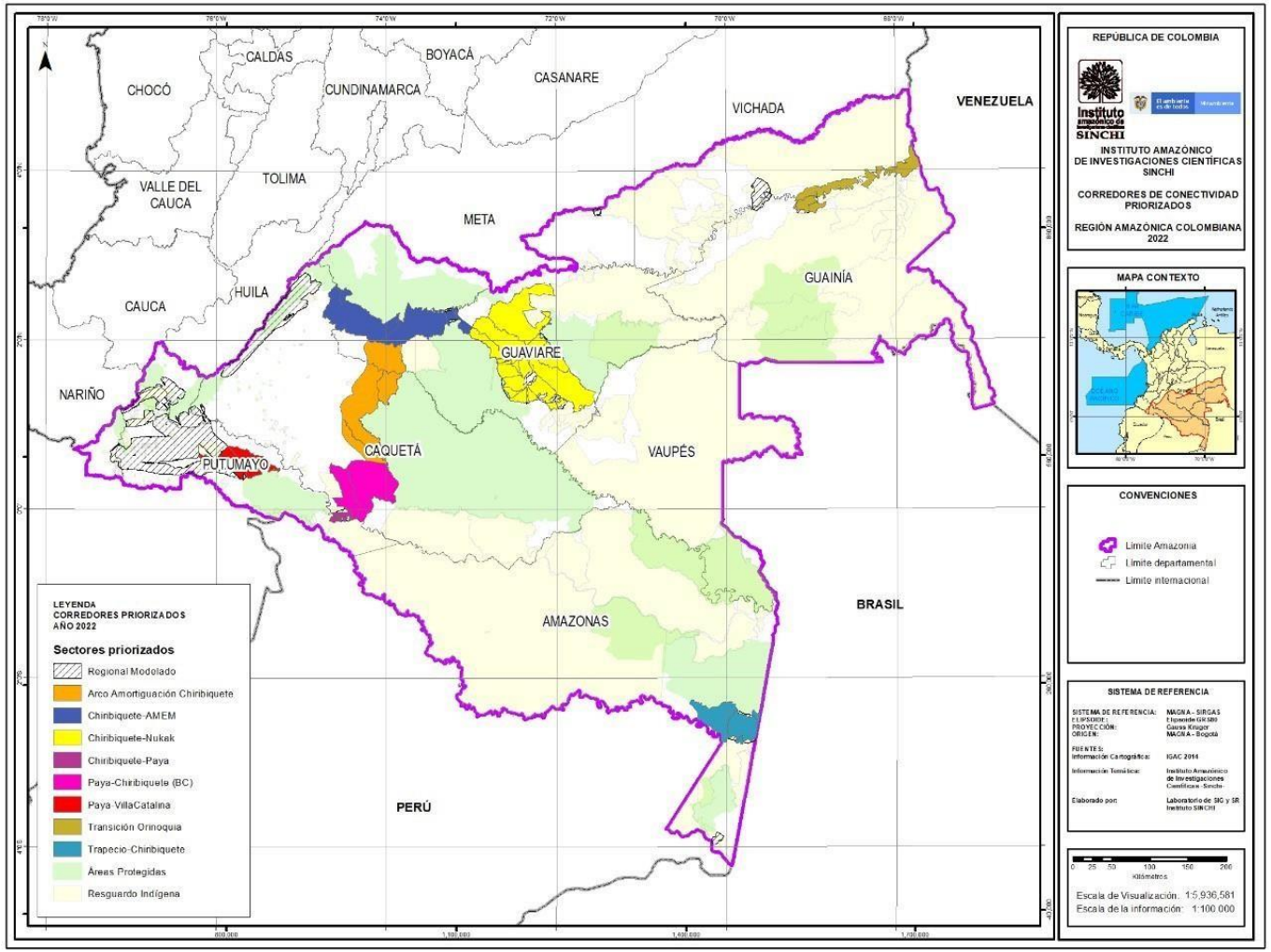


Source: SINCHI 2020

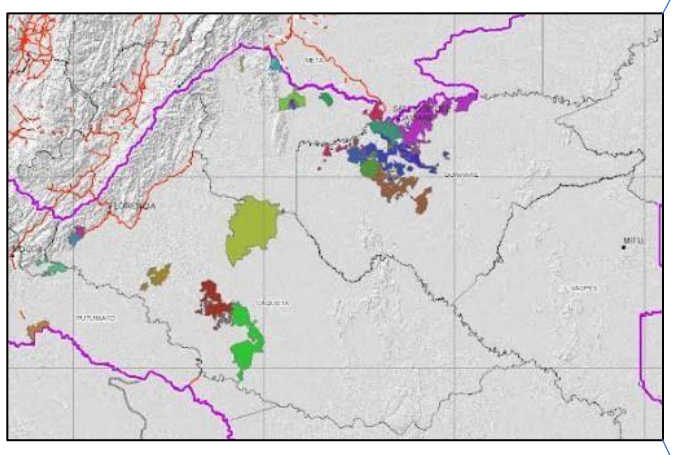
(McRae, B.H. & Kavanagh, D. M. 2011 ; McRae et al., 2008)

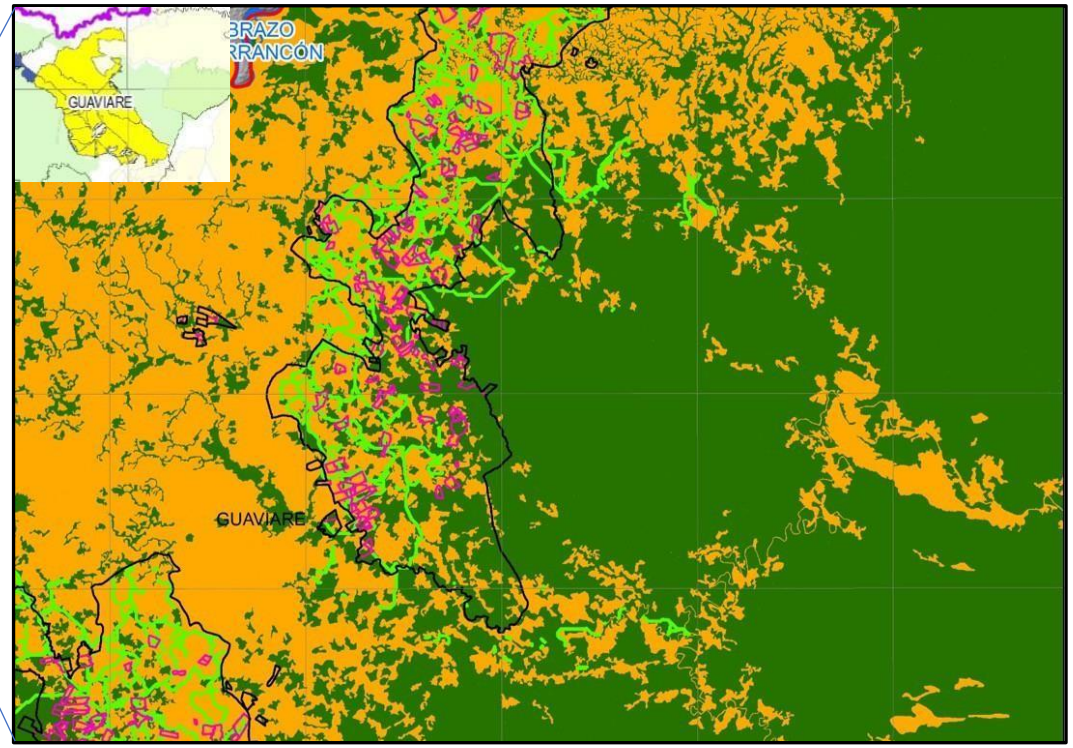
IIc. Identification and spatialization of key areas for the maintenance of connectivity between the Colombian Amazon and adjacent regions.

Prioritized corridors to maintain ecological connectivity between the Amazon and adjacent regions.

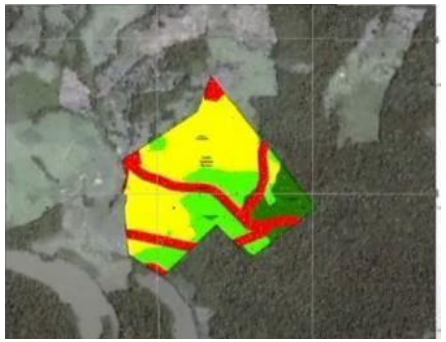


Application of the methodology for connectivity planning at the property level.



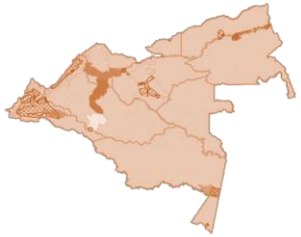


Scale 1:10.000. Predial level



Application of landscape management tools:

- Silvopastoral systems
- Agroforestry systems
- Forest enrichment
- Restoration



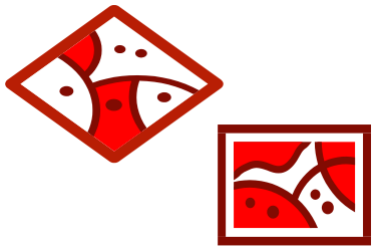
How was participatory connectivity planning incorporated into the planning process?

•It should be carried out in a differentiated manner according to the scope of the study: Regional

Local

Subregional

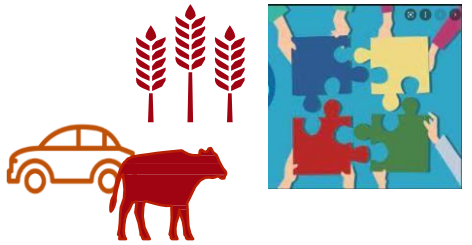
How was spatial planning for connectivity incorporated into the corridor planning process?

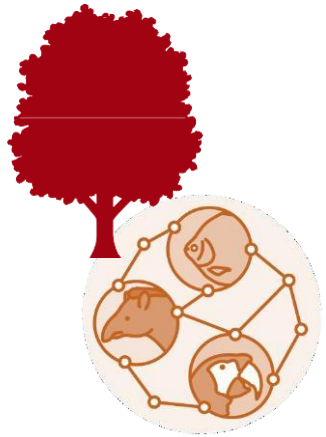


- The spatial component was incorporated from phase 1 of the methodology. It is the basis of the exercise and is transversal throughout the process.

Challenges and Lessons Learned

- Availability of applicable information for the fiscal year (particularly for species data).
- Make the corresponding management so that the corridors become part of the environmental determinants for the Colombian Amazon.
- Conduct similar exercises at the subregional and local levels.
- Collaborative work with communities and farmers' associations is essential.





Thank you for your attention

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El ambiente es de todos Minambiente

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