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The limits of Carbon Market Integrity: Governance tensions in Land-Based carbon credits

Adriana, Martin [1,2]; Carla, Baldivieso-Soruco[1]; María Soledad Andrade-Díaz[1,2]; Patricia, Roche[6]; Oscar, Rodas[6]; Luca, Eufemia[1,7]; Janika, Hämmerle[5]; Sergio, Bolívar-Santamaria[1,3]; Stefan, Sieber[1,3], Maria, Piquer-Rodriguez[2]; Michelle, Bonatti[1,3,4]

1 Leibniz-Zentrum für Agrarlandschaftsforschung (ZALF) e. V., Development-oriented agricultural international research group, Müncheberg, Germany; 2 Freie Universität Berlin, Institute of Geographical Sciences, Modelling Human-Environmental Interactions, Berlin, Germany; 3 Humboldt-Universität zu Berlin, Department of Agricultural Economics, Agrifood Chain Management, Berlin, Germany; 4 University of Vila Velha, Espírito Santo, Brazil; 5 University of Tasmania, Australia; 6 World Wildlife Fund for Nature (WWF) Paraguay, Asunción, Paraguay; 7 World Wildlife Fund for Nature (WWF), Mediterranean Marine Initiative, Rome, Italy

Introduction

- Biodiversity loss and land degradation in Paraguay result from governance models that historically have privileged land concentration, creating deep social inequalities and failing in nature protection.
- Inadequate governance combined with current and projected climate impacts intensify the crisis. Scientists and policymakers recognize transformation is essential (West et al. 2024)
- Transformation to sustainability requires alternatives to the paradigms and policies that have generated social-ecological destruction
- Environmental Policy in Paraguay, positions carbon markets as a central financial instrument for conservation; however, without integrity, markets risk perpetuating the destructive logics they should transform.
- Market integrity, the alignment between what markets promise and what they deliver, requires to address land rights, consultation, and benefit-sharing
- This paper examines how governance tensions over values, principles and practices shape integrity and determine whether carbon markets become effective in support transformation towards sustainability.

Objective

This study examines how governance tensions at the local level shape carbon integrity in land-based carbon credits in Paraguay by analysing how relational values, principles and practices interconnect to define what integrity means for carbon markets.

Analytical framework: Relational values, principles and practices

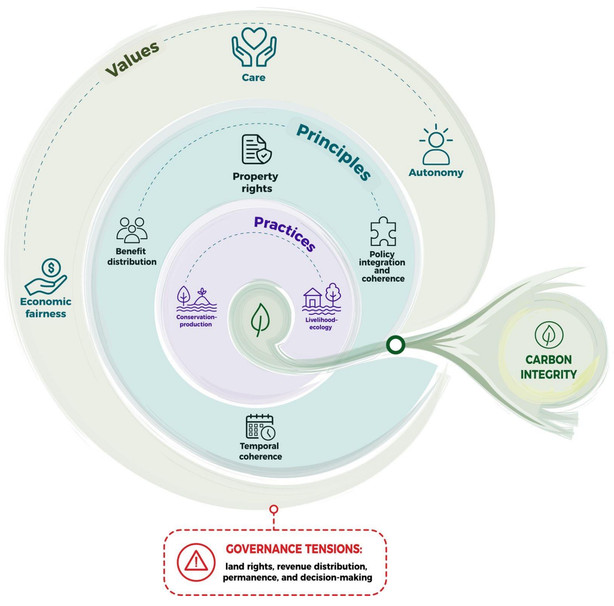

Fig 1: Analytical framework (based on Karen O'Brien's work on transformation towards sustainability, O'Brien, 2018)

Methodology

We used Participatory Rich Picture Modelling (RPM), a qualitative method used in transdisciplinary research (Bell and Morse 2013; Glaw et al. 2017; Mello et al. 2025), combined with semi-structured interviews conducted in Paraguay between October 2024 and May 2025.

- 44 semi-structured interviews across four localities (Asunción, Pilar, Filadelfia, Presidente Hayes) with 21 organizations
- Participatory co-creation workshop: 34 participants from 32 organizations across seven sectors co-created four Rich Picture Models

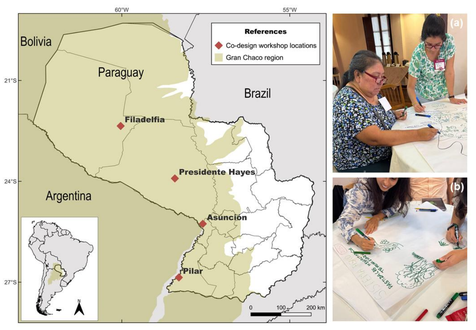

Fig 2: Case Study location where interviews were conducted

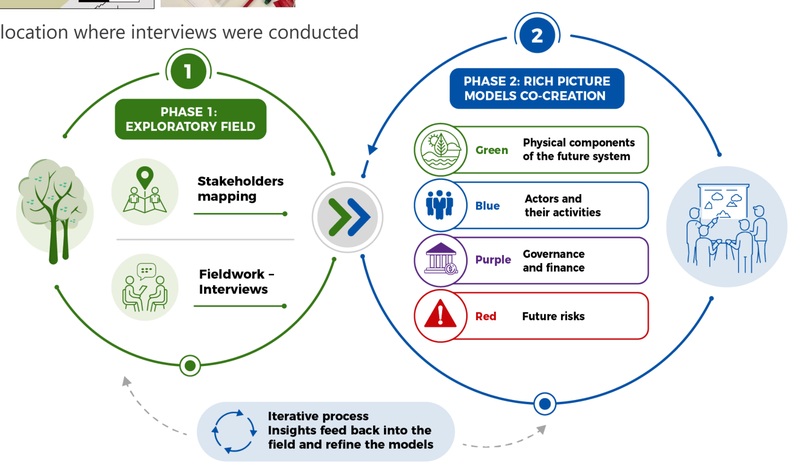

Fig 3: Two-phase data collection process: exploratory interviews and participatory co-creation workshop

Governance tensions: four points of conflict

Land Rights: Paraguay has one of the world's most unequal land distributions: 4.3% of landowners hold 90% of the country's land, while Indigenous Peoples have secured approximately 25-30 times less than their ancestral territories (Güereña and Rojas Villagra 2016; Villagra 2021). Within this context, communities derive authority from their relationships and care for the land; carbon markets confer ownership of carbon credits through formal title.

Benefit Distribution: Value goes through asymmetric channels, undisclosed intermediary costs, underestimation of carbon price in carbon credits from Global South. Communities cannot track whether they receive fair shares.

Permanence: Local organizations understand permanence ecologically (sustaining water and soil processes); carbon accounting registers only measurable biomass, overlooking the socio-ecological relationships that keep carbon in the ground long-term.

Decision-Making: Carbon markets demand centralized, top-down regulation; communities govern through distributed, locally grounded decisions. International standards reach communities already written, often experienced as imposition rather than participation.

Conclusions

- Carbon integrity is relationally produced across values, principles, and practices; it depends on the coherence among what local actors value, how governance systems operate, and how land is actually used. Integrity exists when these three spheres align.
- Four governance tensions, land rights, benefit distribution, permanence, and decision-making, reveal that addressing carbon integrity requires more than technical accounting improvements. It demands governance that recognizes community authority over land, just benefit distribution and participation in decision making.
- Carbon markets able to incorporate values, principles, and practices through which communities sustain territories could have greater potential to deliver the stable, credible climate finance transformation requires

References: please scan the code

Leibniz Centre for Agricultural Landscape Research (ZALF) | Eberswalder Straße 84 | 15374 Müncheberg | Germany
Contact: Adriana Martin. Adriana.martin@zalf.de

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