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The limits of carbon market integrity: governance tensions in land -based carbon credits

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Abstract

Carbon markets have gained significant relevance as mechanisms for climate finance, with high-integrity credit supply projected to drive demand to 7.9 $GtCO_2e$ by 2030. Yet integrity frameworks remain predominantly focused on carbon accounting methodologies, overlooking the governance tensions that fundamentally shape whether land-based carbon projects deliver legitimate climate outcomes. This research examines how governance tensions at the local level shape what integrity means in land-based carbon credits, using the Paraguayan Chaco as a case study.

We explore this question through a relational lens, understanding carbon market integrity not as a technical attribute of accounting methodologies but as something that emerges through relationships between diverse actors, farmers, indigenous communities, government agencies, project developers and the ways these actors relate to nature and each other. From this perspective, integrity is continuously constituted through negotiations over what counts as legitimate land use, whose knowledge matters, and how governance tensions open or close pathways for transformation.

The Paraguayan Chaco, represents 62 % of Paraguay´s territory and is one of South America's most significant carbon sinks. Paraguay recently established a national carbon market regulatory framework, creating a unique opportunity to examine how governance structures interact with perceived territorial tensions before market expansion intensifies them.

To ground the relational framework empirically, we conducted Rich Picture Modelling (RPM) workshops in Asunción in May 2025 with 34 participants from 32 organisations across seven sectors, complemented by 44 in-person interviews across four Paraguayan localities. RPM is a transdisciplinary visual methodology that makes visible the values, principles, and material practices through which diverse actors understand governance arrangements, dynamics that formal policy processes routinely render invisible.

The analysis revealed four critical governance tensions undermining integrity: formal property rights systems that structurally exclude indigenous communities from project participation; fragmented multi-agency authority creating incoherent regulatory environments; temporal mismatches between multi-decade carbon commitments and short electoral government cycles; and certification frameworks that impose compliance relationships rather than enabling contextually appropriate solutions.

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This research suggests that recognising these tensions can help navigate and strengthen this carbon market system that delivers on its integrity promise.

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