

## Sustainability and Ecological Functionality of the Agricultural Frontier: An Integrated Sociometabolic and Landscape Ecology Analysis of the Cauca River Valley (Colombia)

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Many would argue that agricultural industrialization and the Green Revolution have driven a necessary increase in the productive yields of food and raw materials on the planet. However, this land and socioecological transformations have also been associated to great environmental and social impacts. This presents a challenge for our societies: feeding itself in a sustainable way without destroying the environment and maintaining the ecological processes that guarantee its permanence on the planet.

Even though this is a global concern and despite been an evident visual phenomenon, land use transformations associated to the industrialization and intensification of agriculture and its consequences are not fully understood. Furthermore this is the center of crucial and actual debates on agrarian development and sustainability, particularly important for countries like Colombia, a highly biological and culturally diverse country, where agricultural industrialization, neoliberal economic policies, social inequality and the dynamics of land use and land tenure have contributed to a prolonged armed conflict.

This research aims to assess the contribution of different agricultural systems to the socioecological functioning of the landscape and the sustainability of the agricultural frontier on a tropical inter-Andean river valley (Cauca river, Colombia). Based on models of land use, landscape ecology, social metabolism, provision of ecosystem services and global change this study aims to propose an Integrated Socioecological Analysis of Agroecosystems for territorial planning. Since all this happens within a complex sociocultural context in which the rural livelihoods of indigenous, peasants and black communities are at a crossroads with regional agrindustrial development, particularly linked to sugarcane plantations.

This seminar will present the preliminary results on the landscape ecology analysis as well as the proposed methodology to build a typology of agroecosystem to assess their energy efficiency and the relationship to landscape ecological process.

