# Institutional Design and Landscape Fragmentation: A Comparative Study of Rural Colonization Projects in the Brazilian Amazon

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## ABSTRACT

Government-sponsored projects of rural settlement are among the key processes in leading to landscape change in the Brazilian Amazon. Despite their primary goal of providing land for small farmers, their establishment brings along a complex social structure including other actors, such as loggers and extractivists. The diversity of situations involving different actors, biophysical features, and institutional designs, directly affect the structure of incentives, creating a mosaic of land cover trajectories and landscape patterns. This paper addresses the influence of different architectures of colonization and institutional designs upon landscape fragmentation in the State of Rondônia (Western Amazon), where development projects have been a routine over the last twenty years. We carry out a comparative analysis of two adjacent settlement projects established in the early 80's encompassing approximately 3,000 sq.km. The settlements differ in terms of lots allocation and land tenure arrangement. Vale do Anari was based on private properties placed along an orthogonal road network, following the standard design of colonization in the Amazon (often referred to as a 'fishbone' pattern). Machadinho d'Oeste took topography into account for lots allocation and its design included sixteen forest reserves housing local rubber tappers. Landscape structure indices were calculated, using multi-temporal LANDSAT TM image classifications, dated 1988, 1994, and 1998. The results show higher deforestation rates and forest fragmentation in Vale do Anari. We discuss the accountability of these different settlement designs in affecting landscape fragmentation, which is useful to evaluate new strategies resulted from the establishment of colonization projects in the Amazon.