

Book abstracts

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B3 Forest multi-functional system and adapting management: the challenge to deliver multiple goods and services to mitigate changes

From forest transition to ecosystem services transition: Dynamics of ecosystem services in the Reventazón watershed in Costa Rica

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The forest transition theory has provided a framework for the analysis of land-use (LU) dynamics worldwide and has described economic development trajectories leading from contraction to expansion of forest areas. This framework does not differentiate forest cover types or ecosystem services (ES) because it uses an indicator of areas for describing forests regardless of their state and contribution to human well-being. Over the past decades, growing populations and human activity have increased pressures on ecosystems and heightened the demand for provisioning ES, particularly in tropical forested regions, where LU change is simultaneously the main driver of the decrease of ES provided by forests and the increase of ES by agricultural lands. We propose a framework to analyze Ecosystem Services Transition, i.e. changes in the delivery of bundled ES, driven by development trajectories and the demand for ES. We apply this framework to the case of Reventazón watershed in Costa Rica, a mountain socio-ecological system that has undergone major changes in LU and ES which are expected to continue. The aim of this work was to: (1) map selected ES using InVEST modeling tool; (2) analyze the historical dynamics of the selected ES; (3) identify socio-economic drivers. The analysis of ES dynamics in our study site revealed a transition in ES, although some trends are only nascent and still uncertain. Trends in regulating and cultural services followed a U-shaped curve (recent increase after previous decrease), while forest provisioning services followed an inverted U-shaped curve and agricultural provisioning services do not display a clear recent trend. If the demand for provisioning services was a main driver of changes in landscapes and economic services from the 1940s to the 1980s, the current evolution (from the 2000s) is also driven by demand for regulating and cultural services related to water, carbon and tourism.

Keywords: Ecosystem Services, Dynamics, Ecosystem Services Transition, Costa Rica