119. Spatial models of farms territories, policy instrument and climate change: application in Chorotega (Costa Rica)

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Climate mitigation and adaptation can be tackled at the landscape scale, combining agricultural and non-agricultural components, reduced deforestation, development of agro-forestry and integrated crop-livestock systems. The spatial distribution of land use could be critical to address both the climate change issue and the income generation and distribution. Should land be spared or shared to reach climate smart goals? To answer this research question, we analyse the impact of the Costa Rican program of Recognition for Environmental Benefits (REB) on the layout of land use in farms located in the Chorotega Region (Northwestern Costa Rica) characterised by confronting environmental issues, such as the recent forest recovery process, land degradation and water scarcity. The Ministry of Agriculture has implemented the REB program since 2007. Extensive livestock is the main sub sector and area for REB use. A survey in 64 farms that participated to the REB program was carried out from March to May 2014. This survey enables to collect information related to the evolution of farms' activities and their location before and after their participation to REB. We process this information by using spatial methods (graphical modeling, "chorèmes") to identify patterns of land use distribution. Participants apply for four main types of investments: living fences, improved pasture, fodder banks, living fences or reforestation to protect water resources. They fall into three spatial models of farm land use layout. The first is characterized by a territory divided into parks for a rotating pasture. The second model is a concentration on the best land with livestock intensification and natural resources management on the remaining land. The third model corresponds to diversified farms with a spatial organization in mosaic of crops. Implications of these models for climate change adaptation (especially regarding water resources), mitigation (carbon sequestration) and food security are discussed.