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Linking Land Use Displacement, Agricultural Intensification and Forest Transitions – A Contribution to Theory Development in Land System Science

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Abstract

Land constitutes a nexus between the current environmental and societal challenges. Balancing these tradeoffs and synergies is the focus of Land System Science (LSS). Within this frame, we analysed the three central issues of contemporary land systems: land use displacement, forest transitions and agricultural intensification. We started by establishing a set of operationalizable hypotheses and causal mechanisms based on different theories addressing those topics (environmental Kuznets curve, ecological modernisation, comparative advantage, pollution haven, theories on forest transition among others). LSS has contributed to understand the causes and consequences of land change through the production of methodological innovations, empirical observations and contextual explanations to land changes, in particular through case studies. However, very little theoretical development has taken place in this discipline. Theories intended to explain these three types of land changes leave important aspects unexplained and theory addressing the linkages between their dynamics is not convincing. Models in land changes also suffer from this, as they are often based on practical rather than theoretical considerations. In addition, the important role of trade because of globalisation is sometimes not properly taken into account; current geographic and economic theories focus either on international trade or on local land change processes but they rarely link the two. The methodology of this paper consists on a review of different theories that deal with land changes and the identification of the hypothesis and causal mechanisms in which they are based. Followed by the operationalisation of those hypotheses and their analysis using panel data econometrics. The panel is composed by a sample of 200 countries, which have been classified into smaller and more homogenous groups. With that propose socioeconomic data (from World Bank, ILO, World Development Indicators), trade data (from United Nations COMTRADE, FAOSTAT), biophysical variables (from FAOSTAT) and variables on consumers attitudes has been used. The results obtained from the econometric analysis are expected to fix the current gap of LSS in theory development and move forward a new generation of LSS. At the same time, this information will serve policy makers when making decisions on land management at global and local scales.

Keywords: Agricultural intensification, forest transitions, land system sciences, land use displacement, trade

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