



2014 GLOBAL LAND PROJECT OPEN SCIENCE MEETING *Land transformations: between global challenges and local realities*

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*The role of system properties in driving socio-ecological transitions:
The case of Messara Valley, Crete, Greece*

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Conference Session

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- NUMBER: 087
- TITLE: Trajectories of change in agro-ecosystems
- CATEGORY: Research Presentation Session

Abstract

The interplay of exogenous and endogenous forces underlies human responses in land systems (what people do the way they do it) that cause socio-ecological transitions along its evolutionary path. This study argues that human responses modify system properties that, in their turn, feedback on human decision making and affect responses to future forces. This conceptual approach was adopted in the EU-funded FP7 project LEDDRA to assess the socio-ecological resilience of land systems. It builds on the position that socio-ecological resilience is a global system property that emerges from the place- and time-specific combinations of lower level properties that shape the land system's resilience *sensu stricto* as well as the ability of social actors to manage this resilience through adaptation and transformation. Resilience *sensu stricto* is assessed in terms of the attributes of the stability landscape (Walker et al. 2004). Human responses modify these attributes and, under particular place- and time-specific combinations of biophysical and socio-economic circumstances, lead to land system transitions.



This presentation concerns a case study that illustrates the application of the LEDDRA conceptual approach for the analysis of the Messara Valley (Crete, Greece) land system that has undergone two major transitions in the post-WWII period. The LEDDRA conceptual approach, embedded in the broader pertinent literature, is briefly presented first. The Messara Valley, a cropland socio-ecological system, is described next the emphasis being on the major phases it has passed through, the exogenous factors at play over time, the interplay of system properties and human responses in each phase and the mechanisms through which the major transitions of the Messara Valley system occurred under particular combinations of exogenous and endogenous forces in specific points in time. The explanation of the post-WWII trajectory of the Messara Valley system attempts to provide support to the LEDDRA conceptual approach that the study of land system properties can meaningfully contribute to the analysis of socio-ecological transitions and support the associated policy and decision making. Future research directions conclude the presentation.

The presentation contributes to Theme No.1, “Rethinking land change transitions”, since it deals with a range of issues relating to land use and land management changes, by examining historic land use transitions and system shifts. It specifically contributes to session No. 087 “Trajectories of change in agro-ecosystems” because it negotiates both a conceptual framework of studying such trajectories and an empirical application of it centered on human responses.

Walker, B., C. S. Holling, S. R. Carpenter, and A. Kinzig. 2004. Resilience, adaptability and transformability in social–ecological systems. *Ecology and Society* 9(2): 5. [online] URL: <http://www.ecologyandsociety.org/vol9/iss2/art5>