



## **Challenges in the participatory assessment of sustainable management practices in dryland ecosystems under regime shifts**

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Regime shifts, defined as a radical and persistent reconfiguration of an ecosystem following a disturbance, have been acknowledged by scientists as a very important aspect of the dynamic of ecosystems. However, their consideration in land management planning remains marginal and limited to specific processes and systems. Current research focuses on mathematical modeling and statistical analysis of spatio-temporal data for specific environmental variables. These methods do not fulfill the needs of land managers, who are confronted with a multitude of processes and pressure types and require clear and simple strategies to prevent regime shift or to increase the resilience of their environment.

The EU-FP7 CASCADE project is looking at regime shifts of dryland ecosystems in southern Europe and specifically focuses on rangeland and forest systems which are prone to various land degradation threats. One of the aims of the project is to evaluate the impact of different management practices on the dynamic of the environment in a participatory manner, including a multi-stakeholder evaluation of the state of the environment and of the management potential. To achieve this objective we have organized several stakeholder meetings and we have compiled a review of management practices using the WOCAT methodology, which enables merging scientific and land users knowledge.

We highlight here the main challenges we have encountered in applying the notion of regime shift to real world socio-ecological systems and in translating related concepts such as tipping points, stable states, hysteresis and resilience to land managers, using concrete examples from CASCADE study sites. Secondly, we explore the advantages of including land users' knowledge in the scientific understanding of regime shifts. Moreover, we discuss useful alternative concepts and lessons learnt that will allow us to build a participatory method for the assessment of resilient management practices in specific socio-ecological systems and to foster adaptive dryland management.