

## CASCADE MSc / PhD Research Information

### Research Title

**The role of land management in preventing catastrophic shifts of dryland ecosystems.**

### Abstract

Land use and land management practices are greatly influenced by the dynamic of the ecosystem on which they rely. At the same time, they can play a major role in the trajectory of this very same dynamic. This study will tackle the issues of sustainability, resilience, timing and scale to get more insights into potential mechanisms including the role of management measures regarding ecosystem tipping points, thresholds and shifts.

In particular, we will study the resilience of land management practices in case of abrupt changes in the local environment, and their systemic impacts in regard to the approximation of a tipping point.

By taking move from methodologies developed in WOCAT and other previous EU projects (such as DESIRE, DeSurvey, DesertLinks), the research will address the subject in an integrated manner, using the scientific knowledge elaborated in the CASCADE project and a variety of indicators from the scientific literature to analyze, at a landscape scale, the different management practices in the study sites.

The first stage of the research will be to identify and test, with the contribution of stakeholders, a methodology to evaluate the impact of land management practices on dryland degradation and threshold behavior. The aim is to create a multi-scale, integrated set of indicators, calibrated in the study sites but useful for application on drylands all over the world.

Secondly, guidelines and tools for evaluation and assessment of resilience will be elaborated. The aim is to provide the stakeholders in the study sites with a practical instrument to assess and potentially improve the sustainability of their land use and land management practices.

### Objectives of the research

- To identify and evaluate land management practices in the study sites, both past and present, and their impacts on the environment.
- To develop a methodology using robust but simple indicators to study the relationship between land management and the abrupt changes that occur in the local environment.
- To build, in a participatory manner, a simple tool for land managers and land users in order assess resilience of land management practices and finally to prevent catastrophic ecosystem shifts.

### CASCADE study site

All study sites will be considered in the project.

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