Assessing the relation between hydrological connectivity and vegetation health in the Moroccan Atlas mountains

Department: Sustainable Development
Research group: Environmental Sciences
Supervisor: Ángeles G. Mayor
Email address: a.garciamayor@uu.nl

Project description

This research proposal is framed on an ongoing project about the potential of using a connectivity-based approach to integrate geomorphological, ecological and social networks in the study of food-related transitions in subsistence communities of dryland mountains. Land degradation in these systems, caused by the interaction between unsustainable land management and climate change (e.g., torrential rainfalls causing fast floods) is severely damaging the livelihoods and food security of billions of people worldwide. The study area is the Ounila catchment (High Atlas mountains, Morocco) where a shift from nomadic to sedentary livestock farming has caused overgrazing and the associated degradation of rangelands and their food resources, as well as the loss of social cohesion. A recent thesis applied the Network Structural Connectivity framework (Cossart and Fressard 2017) to the Ounila catchment in order to define the hydrological network and identify connectivity hotspots. Another recent thesis studied the spatiotemporal dynamics of vegetation health in the Ounila catchment. There is strong empirical evidence supporting the negative effects of hydrological connectivity in the vegetation health of dryland ecosystems (e.g., Mayor et al. 2008; Saco et al. 2020), however, this mostly correspond to analysis at the hillslope scale and for a point in time. This assistantship aims to help moving a step forward by connecting the two existing datasets to study the relationship between hydrological connectivity and long-term dynamics of vegetation health at the catchment scale. This research will potentially contribute to the spatial design of interventions to reverse the ongoing land degradation processes in the study area.

Job requirements

Knowledge or strong interest in learning GIS and R is recommended for this project, as well as background knowledge in hydrology or ecohydrology.

Overall view of the study area in Morocco (left) and detail of fast floods in 2014 (right)