

## Submitted Abstract

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>> SYNTHESIZE MOUNTAINS OF KNOWLEDGE <<

## Abstract

The Traditional and Historical Irrigation Systems (T&HIS) are communal systems, strongly linked to the evolution of the Mediterranean mountains landscapes, its biodiversity, and human wellbeing in the region, documented as far back as the 9th century.

The MEMOLab, has been researching and empowering T&HIS in the Sierra Nevada range (Southern Spain) for more than 10 years. Based on bottom-up collaboration with the local irrigation communities governing these communal systems, scientific evidence (e. g. ecohydrological) and traditional ecological knowledge (TEK) has been documented and compiled, helping to better understand the services and values these systems provide.

Besides the most obvious services provided -including regulation of hydrological cycles, recharging aquifers and springs helping to guarantee the supply of drinking and irrigation water-, T&HIS allows a high level of agricultural (crops, pastures, etc.) and biological diversity.

T&HIS are powerful tools to climate change mitigation and adaptation, as well as to prevent and minimize natural disasters. Evidence shows that T&HIS prevents fires by minimizing periods of drought and reducing temperature and increasing humidity. They also reduce erosion and the risk of landslides by improving vegetation cover, regulating surface runoff, and regulating the torrential nature of rivers and floods. Their operation and maintenance have a minimal carbon footprint, and their soils and associated vegetation fix large amounts of carbon, making them major climate change adaptation and mitigation tools.

From the social point of view, T&HIS governance system has proved to be a key tool for social cohesion thanks to its conflict resolution systems. It also improves social justice through a consensual and equitable distribution of water, contributing to a more participatory society and democratizing decisions on essential resources. T&HIS contribute to local circular economy (e. g. use local natural materials and produce no waste) with low dependence on technology, fuels, and other external inputs, making these systems particularly sustainable and resilient. T&HIS contribute to the food sovereignty of mountainous areas by increasing the productivity of crops, pastures, and other ecosystems, while increasing family income, contributing to mitigate rural depopulation, a huge problem in rural Europe, especially in mountainous areas.

The knowledge and preservation of this historical and cultural heritage as something living and active is a tool that helps to mitigate problems and develop and transfer solutions in the social, economic, and environmental fields.

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