



Water demand for agricultural use under climate change scenarios. AGUAGRADA Project.

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The sensitivity of Mediterranean agri-food systems to the projected and already observable effects of climate change (CC) highlights the need to implement practices and policies that promote efficient water use in food production. In this context, the AGUAGRADA project aims to analyse water demand for agricultural use under future CC and adaptation scenarios in a sub-basin of the Segovia province through hydrological and agronomic modelling using SWAT and AquaCrop.

The study area, the Arroyo de la Balisa Sub-basin (SCAB), reflects typical trends in Castilla y León (Spain), where nearly 40% of the area is dedicated to rainfed winter cereal crops, such as barley and wheat. Industrial crops, primarily rainfed sunflower, occupy another 10% of the area. Other systems, such as irrigated herbaceous crops, vineyards for winemaking, and extensive livestock farming, also play a role.

Starting from a baseline scenario that represents the current agricultural and climate situation, the project assesses future water availability for these and other land uses in SCAB. For this, six global climate models (GCMs) from the IPCC's AR6 (Sixth Assessment Report) scenarios, SSP 4.5 and SSP 8.5, regionalized and evaluated by the Spanish Meteorological Agency (AEMET), are used.

In collaboration with local stakeholders and farmers, various CC adaptation strategies have been selected and grouped into three strategic lines according to the type of management and production system. These strategies include four practices outlined in the eco-schemes of the PEPAC (Spain's Strategic Plan for the Common Agricultural Policy): direct seeding, crop rotation, cover crops, and extensive grazing.

In this way, different levels of CC impact on the SCAB are being analysed. Preliminary model results confirm that without any adaptation to CC, the agricultural sector's performance would be affected due to increased water stress. In other words, the demand for agricultural water use would increase. Therefore, it is essential to analyse the agricultural sector's adaptability by implementing various management strategies. The impact of these will be discussed.

Keywords: Climate Change, Water Resources, SWAT, AquaCrop, Adaptation