



## Evaluating reference evapotranspiration in mountain areas

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The so-called reference evapotranspiration (ET<sub>o</sub>) is one of the key variables for the assessment of crop water requirements and irrigation needs. Standard methods are available for computing ET<sub>o</sub> as well as for the pre-processing of the meteorological data. Many of them have been developed and tested with respect to stations situated at low altitudes. In the context of climate change and its impacts on agriculture there is, however, an increasing necessity for applying these methods to mountain areas. These have been identified as among the most vulnerable environments and have for this reason become the focus of several research programmes such as e.g. the Climate Change Adaptation Programme in Peru (PACC), initiated by the Swiss Agency for Development and Cooperation (SDC) in 2008, and the EU funded project ACQWA.

In this contribution we discuss practical aspects related to the evaluation of ET<sub>o</sub> in mountain areas. As the availability of weather data is generally more limited than in low altitude regions, we examine approaches for the generation of input data with examples from the Swiss Alps and the Peruvian Andes. In particular we consider the estimation of net radiation (NR), as this is the main driver of the heat exchange at the earth surface and controls the evaporative demand of the atmosphere. Empirical approaches for computing NR are examined in the light of data from the Alpine Surface Radiation Budget (ASRB) network and discussed in relation to the implications for ET<sub>o</sub>.