



Effects of climate and socio-economic changes on water availability, use and management at the regional scale – a case study in the dry inner-alpine zone of Switzerland

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The research program NRP 61 "Sustainable Water Management" of the Swiss National Science Foundation had set the goal to provide a basis for sustainable water management in Switzerland. As part of this research program the effects of climate and socio-economic changes on water availability, water use and water management were investigated in the Crans-Montana-Sierre region, situated in the dry inner-alpine Valais (project MontanAqua). The project followed an inter- and trans-disciplinary approach; stakeholders were involved from the very beginning.

We assessed the current water situation with quantitative and qualitative methods: A dense hydro-meteorological network was built-up, tracer experiments were conducted and communal water uses as well as the current water management system were analyzed. These investigations paved the way to develop models to simulate possible changes in the near and far future. For this purpose, we applied existing regional climate change scenarios and developed socio-economic scenarios together with the stakeholders.

The findings of MontanAqua can be summarized into five messages, each with a short recommendation:

- 1 – The socio-economic changes have a greater impact on the water situation in 2050 than climate change: A territorial development that limits water needs is recommended. This requires important changes of current water- and land-management practices.
- 2 – The water quantities available now and in 2050 are generally sufficient. However, shortages are possible in some areas and seasonally: We recommend establishing a regional water management which goes beyond the development of technical infrastructure such as storage facilities or connections between water supply networks. This measure should be accompanied by a clarification and negotiation of water rights at the regional level.
- 3 – Water issues are primarily regional management problems: We advocate for better cooperation between the eleven municipalities of the region and the establishment of a demand management strategy which is aimed at coordinating uses and reducing water needs.
- 4 – Inter-communal measures on infrastructures can help to ensure sustainable water supply, but only if they are integrated into ambitious institutional reforms: A more equitable water management at the regional level requires a new negotiation of management principles and access rights to the water resources.
- 5 – To achieve a sustainable regional water management, improved data management and transparency is needed: We recommend that the Valais Canton develop a strategy for monitoring water at the regional level and for the collection of homogenized data. We also recommend that the Canton assess the current water management at the regional level in terms of sustainability. Finally, we advocate that a study to clarify the water rights is launched.