

Hydropower and Climate Change, insights from the Integrated Water-Energy modelling of the Drin Basin.

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Abstract:

The understanding of the transboundary impact of Climate Change on hydropower is not well-established in the literature, where few studies take a system perspective to understand the relative roles of different technological solutions for coordinated water and energy management. This study contributes to addressing this gap by introducing an open-source, long-term, technologically-detailed water and energy resources cost-minimisation model for the Drin River Basin, built in OSeMOSYS. The analysis shows that climate change results in a 15-52% annual decline in hydro generation from the basin by mid-century. Albania needs to triple its investments in solar and wind to mitigate the risk of climate change. Changing the operational rules of hydropower plants has a minor impact on the electricity supply. However, it can spare significant storage volume for flood control.