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Role of dams and reservoirs in a successful energy transition

Theme B
Dams and reservoirs for climate change adaptation in Europe

From energy producer to water manager: a research-industry collaboration

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1 Introduction

The hydropower industry is expected to play a central role in the double field of energy transition and water security, in a context of climate change, increasing pressure on water resources and geopolitical tensions.

A research project involving Alpiq and the University of Lausanne is developing this reflection, by clarifying the origin of the concept of multiple use of water and hydraulic infrastructure, the perceptions of multifunctionality by the various water and energy stake-holders, and the issues of governance of resources “water” and “hydraulic infrastructures”, particularly in view of the dam relicensing

Research-industry collaboration allows developing a cross-disciplinary approach, and it allows the conceptual models to be confronted to the concrete expectations of stake-holders. Secondly, the collaboration between research and industry augurs a potential application of the recommendations resulting from the research.

2 Methodology

Two lines of research: The first (Fig. 1) is a socio-historical research and the second focuses on the institutional side and the regulation of the various uses using the institutional resource regimes (IRR) analytical framework.

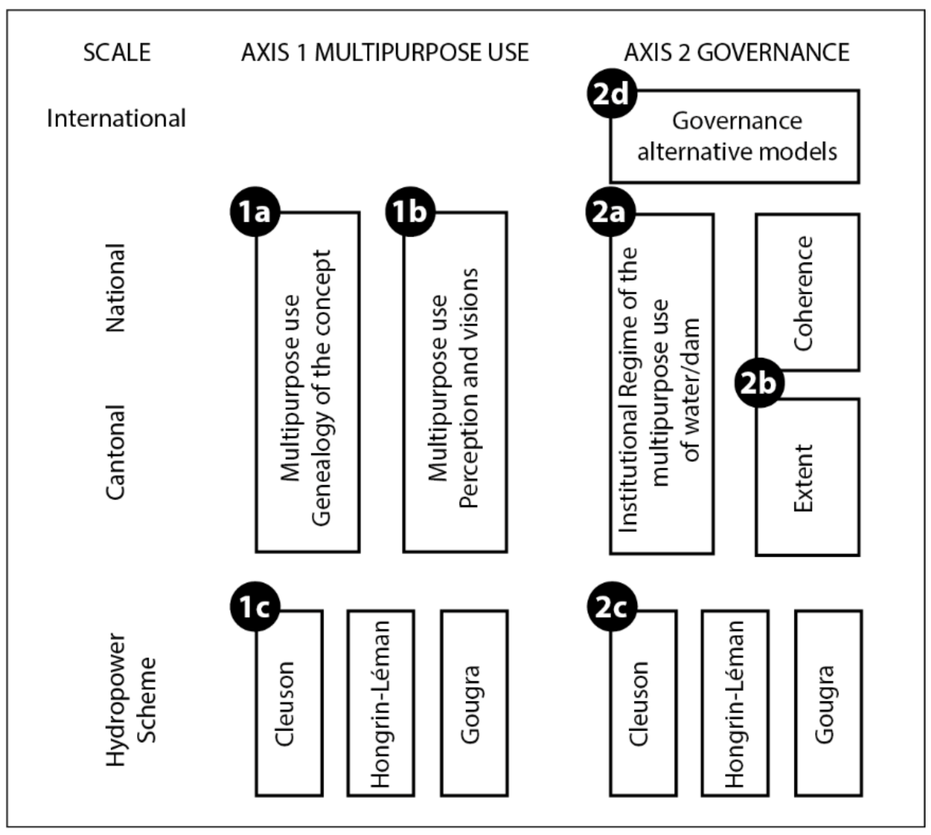

Fig. 1: Research organization, Nahrath S., 2023

4 References

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Flaminio, S., Reynard, E. (2023). Multipurpose use of hydropower reservoirs: Imaginaries of Swiss reser-voirs in the context of climate change and dam relicensing. Water Alternatives, under review.
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3 First results

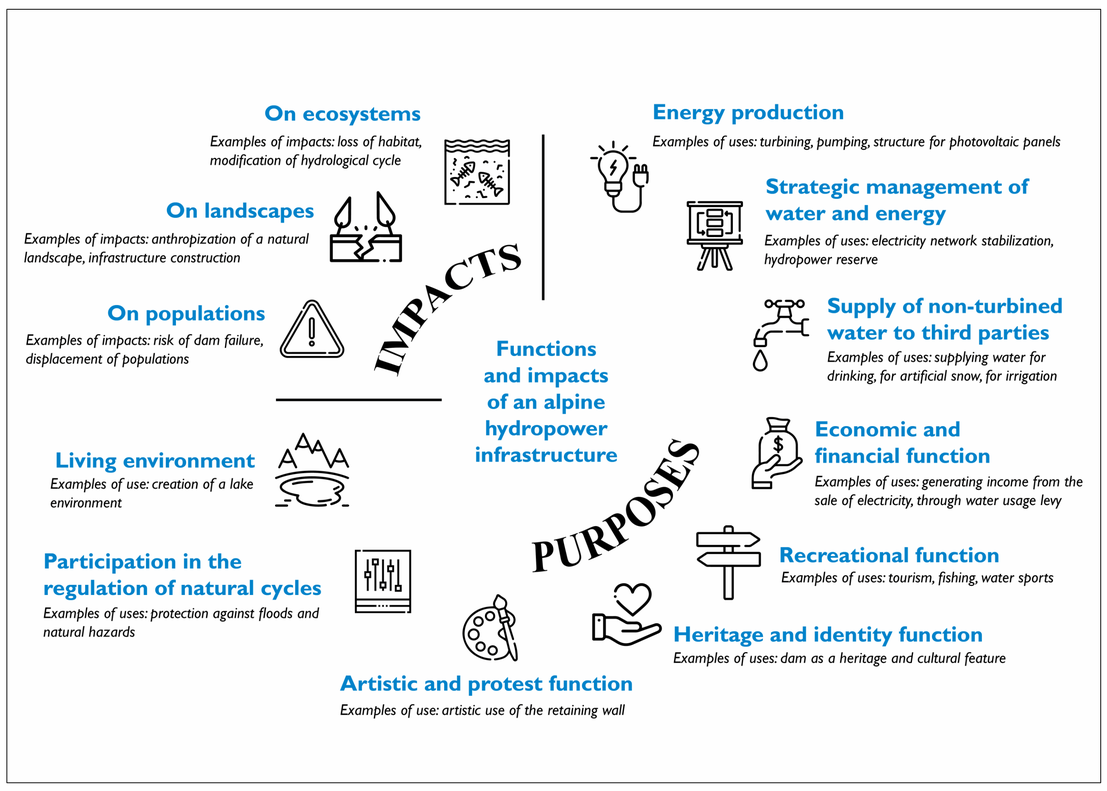

Fig. 2: Functions and impacts of an alpine hydropower infrastructure, Savoy A., 2023

The case study of the Cleuson hydroelectric scheme (Nendaz, Valais, Switzerland) (Flaminio 2023) showed that, over the years, some hydroelectric dams have made it possible to store water for uses other than energy production, such as the production of artificial snow and the supply of drinking water. In these cases, contracts are negotiated between the operating companies and the local authorities. **While this multifunctionality is important for local stakeholders, this represents only 4.2% of the volume stored in the dam.**

Fig. 3: Cleuson dam, Schröder X., 2019

Conclusion

Through this research project, Alpiq and UNIL are seeking to link the fields of energy and water management, to go beyond existing operating models and develop broader socio-political models that cross these two fields. The industrial partner is often a driving force and proactive in these reflections on paradigm changes. In association with science, the industry can reflect on the possible transformations in water supply.