D2.19
Natural Fertilization for Local Farming through Meltwater

Exploration of Advanced Indicators for Stakeholders Engagement in Water Management Systems

MOUNT RESILIENCE

Co-funded by the European Union

1. Executive summary

While water has been abundant in many alpine regions in the past, climate change alters the situation: less precipitation during the summer, and soon less compensation from snow and ice meltwater in late summer. In addition, competition for various usages is increasing. Therefore, water management will become increasingly critical. In democratic states, projects require stakeholders' acceptance to avoid at least delays, if not abandoned. Projects' effectiveness is also related to coherent behavior changes from users. Although citizens keep trust in environmental science in Western Europe, they feel disconnected from this available knowledge. They show reluctance towards projects and framework adaptation related to climate change. Current Decision Support Systems (DSS) are not seen as an effective tool to face this challenge, they are mostly perceived as tools for experts and face lack of adoption.

The MountResilience Swiss demonstrator proposes a disruptive approach, to induce stakeholders' engagement, informed decision-making, and project adoption. It aims to implement a near real-time water sensor network in a watershed, to design and develop a platform converting technical data into clear, engaging and inclusive indicators surrounded by additional useful information. Eventually a bespoke decision-making methodology will be developed to take advantage of these indicators. The demonstrator aims to implement the full data pipeline and its digital interface, measure key adoption factors among stakeholders and identify potential evolutions toward more systemic and holistic perception of the watershed behavior.

Natural fertilization for local farming through meltwater has been selected as an investigation topic for such evolutions: it combines one of the essential human activities in the watershed with one of the most salient alpine environmental changes related to global warming. It is also at a crossroad between quantitative and qualitative dimensions. Eventually, it expresses the complexity of the system. This report investigates how to address such complexity, with the need to:

- *Combine sensors technology innovation to improve real time, reliable, autonomous and low-cost watershed monitoring.*
- *Perform further research to better face diversity of environmental context, understand interaction between elements and variables, predict evolution through scenarios.*
- *Explore human engagement factors to foster informed decision-making, project acceptance and behavioral changes.*

The MountResilience Swiss demonstrator builds upon several conceptual, observation, co-creation and evaluation phases with formative and summative testing, to combine technological, scientific and human-centered design knowledge. The report shows the different initiatives in development to explore this approach, using specific parameters related to meltwater, local farming and fertilization.