MOUNT RESILIENCE

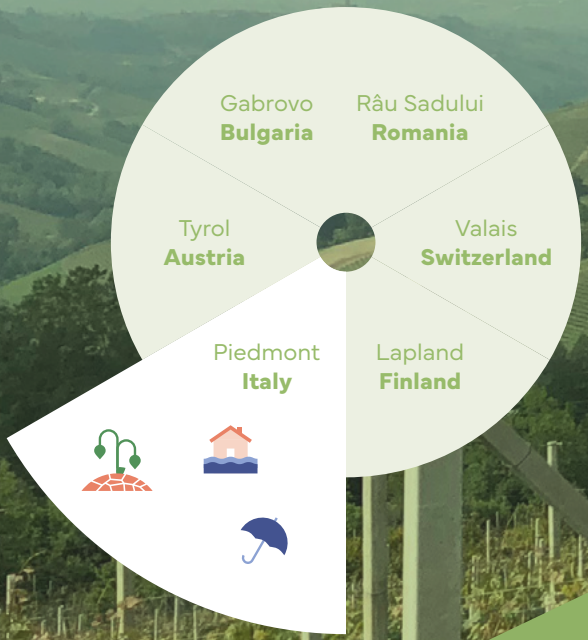
Strengthening the resilience of irrigation systems in the Italian Alps

Climate change adaptation in mountainous areas

Piedmont, Italy

MOUNT RESILIENCE

MountResilience supports European regions and communities located in mountainous areas to increase their capacity to adapt to climate change and to transition towards a climate-resilient society. The project is conceptualising, testing and scaling up climate adaptation and nature-based solutions to respond to policy and societal needs . Additionnally, it seeks to influence citizen behaviours to effectively address specific climate impacts in mountainous regions.



Piedmont, an Alpine region in northwestern Italy, is characterised by a highly diverse environment and hosts a major agricultural area, as well as a strong industrial sector. Over the past 60 years, temperatures have risen by 1.5–2°C, accompanied by more frequent extreme events such as heatwaves, intense rainfall, and droughts. In particular, changes in snowfall and snowmelt are altering hydrological regimes, with a significant impact on agriculture. This is increasing water scarcity, leading to conflicts over water use, and bringing the need for improved water management to the centre of the regional debate.

Adapting to Climate Change

Climate risks:
Precipitation changes, flooding, droughts

Two decision-support tools to help farmers and water consortia to manage water issues

Growing water scarcity and competing demands are making water management more challenging in Piedmont. To address this, two digital tools are being developed to support **better coordination and decision-making**. The first tool, a **Regional Dashboard**, brings together data on soils, crops, irrigation systems, water conditions, and weather to provide a shared overview for planning. The second, a Digital Twin of the irrigation network, simulates how water moves through the system using real and modelled data, helping managers anticipate daily operations.

These tools are being built by integrating different data sources into connected systems. Once ready, they will support decisions at multiple levels: farmers will be able to plan irrigation more efficiently using **real-time data and forecasts**, while water consortia and public authorities will **monitor water availability**, **evaluate irrigation performance**, and **guide future investments**.

Climate risks:
Precipitation changes, flooding, droughts

Reviewing the Regional Law to support resilience

By participating in MountResilience, Piedmont identified the need for a structured, bottom-up and partnership-oriented approach to **water governance**, as well as improved coordination. To respond to this need, MountResilience partners supported by the University of Turin created a working group that is leading the **revision of the regional legal framework** governing the irrigation and land reclamation consortia to better integrate climate adaptation and biodiversity into regional policies. **Continuous dialogue** with the irrigation consortia and local stakeholders is a strategic methodology that ensures that the reform **responds to practical needs** and **strengthens institutional capacity**.

How can farmers and institutions work together to tackle water scarcity in the Italian Alps?

Piedmont shows how climate adaptation in water management can advance when **technological innovation** goes hand in hand with **stronger coordination**. The newly created Regional Dashboard can support farmers for irrigation in critical water-scarce situation while the Digital Twin of irrigation network can support operations and planning in irrigation Consortia. Moreover the revision of the Regional irrigation Law is being pursued through **collaboration between regional authorities, researchers, water consortia, and farmers.**

Through this strong collaboration, the Region is accelerating the **uptake of solutions** and addressing the **legal, environmental, and socio-economic dimensions** of water management in an integrated way.

MOUNT RESILIENCE

REGIONE PIEMONTE

Politecnico di Torino

UNIVERSITÀ DI TORINO

COUTENZA CANALI CAVOUR
OVESTSESIA | ESTSESIA

Consorzio del PESIO
CONSORZIO DI IRRIGAZIONE DI 1° GRADO

UNCEM
Unione Nazionale Comuni Comunità Enti Montani
Delegazione Piemontese

Contact

UNIMONT
UNIVERSITÀ DEGLI STUDI DI MILANO

Project contact:
mountresilience@unimi.it

Regional demonstrator:
Nuria Mignone, nuria.mignone@regione.piemonte.it
Carlo Grignani, carlo.grignani@unito.it
Francesco Ferrero, francesco.ferrero@unito.it
Silvia Mirate, silvia.mirate@unito.it
Luigi Perotti, luigi.perotti@unito.it
Stefania Tamea, stefania.tamea@polito.it
Ilaria Butera, ilaria.butera@polito.it

Co-funded by the European Union

Co-funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or CINEA. Neither the European Union nor CINEA can be held responsible for them.