



5. PROMOTING CLIMATE CHANGE ADAPTATION AND RISK PREVENTION AND MANAGEMENT

What does the EU want to achieve ?

- Developing the knowledge base
- Integrating adaptation into EU policies:
 - Increasing the resilience of health and social policies
 - Increasing the resilience of agriculture and forests
 - Increasing the resilience of biodiversity, ecosystems and water
 - Increasing the resilience of coastal and marine areas
- Prevent natural and man-made disasters and strengthen the European disaster response

How?

The EU aims to support **strategies, management plans, investments, prevention and mapping tools, disaster management systems, water and soil management systems, and genetic diversity** which all contribute to adaptation to climate change and risk prevention. Member States and regions benefit here from a broad flexibility to use the different funds: ERDF is the main funding source; EAFRD cover needs in the field of agriculture and forestry; ESF is identified as a source of funding for training, education and skill development activities; EAFRD is used in the field of farm advisory services. Complementarity with the LIFE programme will also be sought.

How/why mountains can contribute?

Mountain areas are recognised as being among the most vulnerable areas sensitive to climate change (COM 2007-354): fast rising temperatures, significant melting of glaciers, changes of precipitation levels and of water courses, changes in habitats, etc. Mountain economies will be among the most severely affected by climate change due to dependence on snow for winter sports, changes in resource availability, changes in plant species and diseases, and higher vulnerability to natural disasters. This requires a strong adaptation policy for mountain communities and for Europe as a whole, as the impacts of climate change in mountains will influence all of Europe.

According to the EEA (2010), *“the climate of Europe’s mountains has changed over the past century, with temperatures and snowlines both rising. [...] It is likely that temperatures will continue to increase, especially at higher altitudes, and that summer precipitation and wind speeds will increase in northern Europe and decrease in Southern Europe. In the Alps and the Pyrenees, snow fall and snow cover increased during the last century and these trends are predicted to continue. The lower elevation of permafrost is likely to rise by several hundred meters. All these changes will significantly affect diverse ecosystem services and economies across Europe. ”*

The EEA also refers to mountains as being *“Europe’s water towers”* because the precipitation that falls on them, as snow or rain, flows downstream to provide water for domestic, agricultural (especially irrigation) and industrial uses. Thus, *“Changes in land use, hydropower development and climate change may all affect the provision of ecosystem services related to water.[...] Floods often originating in mountain areas are the most common natural disaster in Europe, leading to widespread impacts”*.

Mountains must therefore be seen as a **strong asset for Europe when it comes to mitigating and adapting to climate change:** the places where action will lead to a better situation for all of Europe.

What do they need in order to contribute?

In order to contribute, mountains need to be able to invest in climate change adaptation:

- Development of mountain **climate change observatories** and **risk prevention** and **disaster management** systems, particularly for floods, landslides and fires;
- Adaptation of **tourism strategies** to become climate-friendly and year-round;
- **Maintaining mountain forests** in a good state to prevent natural hazards, helping forest businesses to adapt to changes in species (or, in some cases, plant new species) and diseases;
- **Maintain pastoralism activities** so that they can continue playing their roles in natural risk management (fires, avalanches, landslides, erosion);
- **Increase the water efficiency of irrigated permanent crops.**

Example of actions/practices/policies/projects which could deliver on that objective

- **Investment to prevent damage and increase resilience of the built environment:** invest in flood defences and spatial planning to minimise construction in zones identified as risky.
- **Developing and maintaining observatories of climate change in mountain areas,** to promote knowledge exchange and information sharing, prepare adaptation policies with stakeholders and share best practices for adaptation in mountains. See the example of the [Pyrenean observatory of Climate change](#) (OPCC) created by French and Spanish regions and Andorra, or the [STRADA](#) project.
- **Improve risk prevention systems and disaster management systems:**
 - The INTERREG IVB [PYROSUDOE](#) project has elaborated common tools to improve prevention of forest fires in South-Eastern Europe; the project [AlpFFIRS](#) – “**Alpine Forests Fire Warning System**”, created a network aiming at reducing the impacts caused by fires in the Alps.
 - The **Flood Early Warning System for the Rhine** (FEWS-Rhine) has been developed by a Swiss-Dutch-German Consortium, enabling flood forecasts and warnings; **MINERVE** for the Rhône.
 - A **people-centred early warning system** for extreme weather events (e.g., avalanches, floods) was developed in Sogn og Fjordane, Norway, as part of the [Clim-ATIC project](#).
- **Supporting pastoralism to enhance its capacity to prevent natural hazards:**
 - The managers of the [ski resort of La Peyragude](#), France, have concluded an agreement with farmers, so that their animals graze the ski slopes in summer, reducing the risk of avalanches in winter and allowing the resort to save on costly investments in avalanche barriers.
 - In many mountain areas, silvo-pastoral systems decrease the likelihood of **forest fires**.
- Improving **water efficiency** and **erosion control** of mountain permanent crop systems;
- **Support conservation and exploitation of traditional varieties and breeds:** Mountain farming systems still use many traditional breeds and varieties which can respond well to changing conditions and be resistant to increased water stress or new diseases.
 - In Torino and Trento (Italy), old apple varieties are efficiently cultivated and marketed;
 - Mountains still host a wide variety of sheep and cattle breeds which produce milk, meat or both and are particularly well adapted to the harsh mountain climate;
- **Better exploiting mountain forests to maintain them.** Solutions exist to harvest wood on slopes which, in some areas, can help to achieve better protection functions.
 - Enterprises like the [Gurndin Company](#) (Trento, Italy), harvest wood using cable yarding.
 - The Alpine Space [MANFRED](#) project defined management strategies to adapt Alpine Space forests to climate change risks.
- **Support strategies for adaptation to climate change of mountain tourism destinations:**
 - The project [CLIMAlpTOUR](#) – Climate Change and its impact on tourism in the Alpine Space – provides sound knowledge of the different aspects of the climate change on alpine tourism.

More information: Euromontana thematic page on [environment](#) - [Research on climate change in mountains](#)