



CIRCLE² Policy Brief

- MOUNTain Areas -

Climate Change Impacts, Vulnerability and Adaptation

Summary

This policy brief is directed towards funders and managers of research programmes on climate change impacts and adaptation as well as policy makers concerned. It notes various challenges in addressing climate change and adaptation in research and policy for MOUNTain areas and provides recommendations on research needs.

Mountains cover 36% of Europe's area and are home to 17% of the continent's population. When projecting future climate conditions and evaluating Climate Change Impacts, Vulnerability and Adaptation (CCIVA), both MOUNTain populations and the far greater numbers of people that are living outside of MOUNTain areas, but are dependent on their resources and ecosystem services and are affected by changes deriving from climate change in the MOUNTains (e.g., river discharges, mountains as tourism destinations) need to be considered.

According to the recent IPCC Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (SREX), released on 28 March, 2012, "there is high confidence that changes in heat waves, glacial retreat, and/or permafrost degradation will affect high mountain phenomena such as slope instabilities, movements of mass, and glacial lake outburst floods. There is also high confidence that changes in heavy precipitation will affect landslides in some regions." "There is low confidence regarding future locations and timing of large rock avalanches, as these depend on local geological conditions and other non-climatic factors."

Planning for climate change adaptation (e.g. developing political strategies or deciding on the implementation of adaptation measures) is a rather new challenge for national and local decision-makers. Planners and managers in all sectors have to take decisions now about future strategies, measures and investments aimed at protecting their systems against potential climate vulnerabilities. However, while much knowledge and data about likely future climate change is available for Europe's mountains, projections, socio-economic scenarios, and assessments of impacts and vulnerabilities are highly variable across different mountain ranges and sectors.

New focused research on monitoring and understanding the effects of a changing climate, in particular focusing on long-term monitoring (e.g. in mountain biosphere reserves), ecosystem services, coupled human-environment systems, as well as communication with the public and policy makers is required to advance the knowledge and understanding of the changing climate of MOUNTain areas. This will improve the knowledge on the resulting impacts and vulnerabilities, inform policy- and decision-makers most effectively and support the development of sound adaptation actions.

Reference: M. Leitner, W. Lexer 2012. Climate Change Impacts, Vulnerability and Adaptation in MOUNTain areas. CIRCLE-2 MOUNTain Mid-Term Meeting, Innsbruck, 29-30 March 2012.

Climate Change Impacts, Vulnerability and Adaptation

1. The four projects within **CIRCLE-2 MOUNTain** show that **research on CCIVA** is an **emerging challenge in MOUNTain areas** and CIRCLE-2 research funding institutions are providing the necessary funding and frame. Nevertheless additional efforts (e.g. awareness raising, mainstreaming) and sound science are necessary to better understand the impacts and possible responses to a changing climate in MOUNTain areas.
2. Adaptation to a changing climate in MOUNTain areas needs to be addressed jointly with all other changes and stresses. It requires clear responsibilities and the application of the **precautionary principle, taking robust decisions under uncertainty and knowledge gaps**.
3. **Adaptation** to climate change has to be seen as a **permanent and continuous process** and **joint learning effort**. **Communication** is therefore a **key element**, meaning much more than dissemination and discussion of research results. Communication between science and society/policy needs to be a bi-directional process. In that respect, it takes time to build trust and confidence between scientists, stakeholders, land-owners and the general public. Knowledge exchange and joint learning are major benefits resulting from transnational collaboration.



Figure 1: Joint efforts related to Research in MOUNTain areas (source: EAA, Leitner)

4. Within research in MOUNTain areas focusing on climate change, the Alps are being better addressed than many other European MOUNTain ranges. Nevertheless, the consciousness on climate change remains a challenge with an abstract character. A key need for knowledge generation and research funding is therefore to put more emphasis on the communication of climate change, especially on adaptation. Communication on climate change towards stakeholders should avoid being abstract, but should be as concrete as possible and relate to personal experiences.
5. The **youth**, which will be **most affected** by a changing climate, needs to be **well educated and informed** to **tackle** the **future challenges** and maybe also identify **economic opportunities and advantages**. Climate change adaptation shall be visualized in maps and scenarios, which are jointly produced by scientists and stakeholders, based on the flexible approach (keep certain options open for future developments) making climate change concrete and less abstract.

6. A key issue is **the transfer of knowledge** and the **relevance of research results to target groups** (e.g. policy-/decision-makers, stakeholder, land owners, land managers). The transferability and usability of research results can be improved by learning about the information needs and communication requirements of target groups and by considering that target group knowledge throughout the knowledge production process. Researchers and funders shall **better involve stakeholders in planning and implementing research and ensuring that research results are relevant and taken into account**:
- Usable knowledge production requires process-based interactions between science and policy. High levels of iterativity in this process increase the level of fit between knowledge generation and user needs. Having the “right” stakeholders on board increases the chances that scientific results are actually taken up in decision-making processes.
 - Professional science-policy integration leads to science- and evidence-based political adaptation strategies. Institutionalised and sustainable science-policy interface structures are in favour of usable knowledge production and good scientific knowledge transfer. (e.g., platform for MOUNTain areas and research – e.g. an EEA for MOUNTains).
 - Knowledge transfer and communication towards stakeholders needs to be strategically planned. It is important to consider carefully what is communicated, when, to whom, and via which formats and channels. It is helpful to know which information sources different target groups normally use.
 - Target groups for CCIVA knowledge can be diverse and heterogeneous. Different target groups, e.g. on different levels of governance, have different information needs and require tailored communication strategies. It is not possible to reach all groups via the same communication paths. There is no “one-fits-all” approach to communication.
 - Scientific knowledge transfer and communication can be professionalized. This can be done either by involving professional communicators and “knowledge brokers” or by qualifying researchers in communication skills (e.g. during projects)
 - Researchers can learn a lot from stakeholders. Local knowledge is often the key to relevant CCIVA research results. “Listening is often better than teaching”.



Figure 2: Innsbruck MOUNTains (source: EAA, Leitner)

7. Bringing researchers and research funders/managers from different scales and levels together, aiming at exchanging views on current and future research activities and funding opportunities in the field of mountain research (focus CCIVA).