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A COST Strategic Workshop was organized in Innsbruck, Austria jointly by the Austrian Forest Research Center, Vienna, Austria (BFW; <http://bfw.ac.at>, represented by Robert Jandl) and the Institute of Alpine Research, Innsbruck, Austria (Academy of Sciences; <http://www.uibk.ac.at/igf/>; represented by Axel Borsdorf) from April 7-9, 2008. More than 300 participants contributed to keynotes, group discussions, and project presentations. We concluded that (i) global change (climate, demography, economy, society, politics and culture) has positive and negative effects, (ii) mountain regions are particularly sensitive to global change, and (iii) monitoring systems can help to elaborate strategies which may lead to regional sustainable developments in the mountains. – Future research needs are (i) the development of locally valid climate scenarios using appropriate downscaling instruments, (ii) adaptation strategies to deal with natural hazards (avalanche, torrents; land slides), (iii) the consequences of demographic changes (aging, migration, household changes etc.) for the economy and social coherence, (iv) the assessment and evaluation of desired and undesired forms of land management and ecosystem services such as water provision, protection of infrastructure, and carbon sequestration, (v) the positive (economy) and negative (ecology) effects of tourism and local and trans-regional traffic.

The outcome of the conference will support numerous existing international networks dealing with ecological and economical challenges for mountain regions. Among others the results are acknowledged and used by The Mountain Partnership (FAO), The Alpine Convention, The Carpathian Convention (UNEP), ISCAR, The Mountain Research Initiative, and many others. The presentations are available at <http://bfw.ac.at/mountain/> (webcasts, Summary for Policy Makers) and the proceedings appeared in the Innsbruck University Press (<http://www.uibk.ac.at/alpinerraum/publications/vol7/index.html>).

BFW conducts long-term ecological research in mountain forests in the Alps. An experiment in Achenkirch, Tyrol, Austria, where the forest soil is artificially warmed by 4°C showed that under warmer conditions the CO<sub>2</sub> release from the soil is elevated by 40%. In a companion experiment in Obergurgl, Tyrol we found that the upward migration of the timberline, when dwarf-shrub pastures are gradually replaced by *Pinus cembra* stands, can turn the soil into a source of greenhouse gases. Both experiments show that global change significantly alters the ecosystem services (here carbon sequestration) of forests.

In Achenkirch we demonstrated that soils of mountain forests can effectively retain nitrogen, even when nitrogen deposition rates are temporarily elevated. Forest soils are obviously effective with respect to water purification and are able to sustainably provide water of the highest chemical quality.

Protection forests are indispensable for the inhabitants of settlements in mountain regions because they shield infrastructure, settlements, and ultimately lives. Forests can only exert these positive effects when the stand structure (age, spatial distribution of trees, stand density) is maintained within a delicate range. The costs for stand management exceed the revenue generated from timber sales, because the productivity of mountain forests is often low. Nevertheless, the appropriate stand management is a pre-requisite for the provision of the protective effect of forests in mountain regions.