

## Global Change and Sustainable Development in Mountain Regions

Robert Jandl (BFW, Vienna), Deputy Coordinator of IUFRO Div 8 and Member of the IUFRO Task Force on Forests and Carbon Sequestration; Axel Borsdorf (IGF, Innsbruck); Günter Siegel (COST, Brussels)

A COST Strategic Workshop on "Global Change and Sustainable Development in Mountain Regions" took place in Innsbruck, Austria, from 7-9 April and attracted 342 scientists, experts, practitioners and scholars from 29 European and 10 non-European countries.

### Key Issues and Results

- The ongoing global change (climate, demography, economy, society, politics and culture) concerns the whole world. It brings both positive and negative effects.
- Mountain regions are particularly sensitive to global change. Comprehensive monitoring systems can help to elaborate strategies which may lead to regional sustainable developments in the mountains.
- Long-term ecological research projects should include strong socio-economic components and should be based on harmonized international strategies. Future research activities should rest on the pillars: research + monitoring + education.

### Research Needs

Monitoring of **climate change** and the development of locally valid climate scenarios with appropriate downscaling instruments are necessary. Adaptation strategies need to include the aspects of natural hazards.

**Demographic changes** (aging, migration, household changes etc.) are obvious and may be regarded as a second key driver of change in mountain regions. Depopulation and marginalization of remote areas cause many problems for ecology, economy and social coherence.

The desired sustainable **land use** requires updated concepts for land management. Research on land management and ecosystem services is a central need. The profits generated from agricultural and forestry products do not ensure sustainable land management in the present form. Marketing schemes for ecosystem services are increasingly required. Decisions on land management need to be based on a credible process of participation.

**Tourism** in mountain areas is affected by climate and demographic change and other effects of globalization (new destinations, growing mobility, and new target groups). There are positive and negative effects. Research on new concepts and adaptive strategies are a strong need. Tourism in



Photo: Alpine landscape,  
by Judith Stoeger, IUFRO Headquarters

mountain regions is strongly connected to the ecology and to traditional forms of land use. Therefore climate and land use change are decisive for the development of this sector.

**Water** is a central ecosystem service. As with the climate change and the effects of socio-economic globalization the demand will rise, but production will slow down, and adaptive strategies are to be found. This also concerns juridical, ownership and governance questions.

The rising **transport** causes problems for the Alps, for instance, whereas other mountains presently lack accessibility. Transport and transit questions have to be investigated in the regional context and with hindsight to future traffic corridors in Europe.

Research is no longer to be done in an ivory tower. A strong theory-practice compound as well as a functioning **interface with policy** are needed.

As the participants had different disciplinary backgrounds and came from almost all mountain regions of the world, the discussions demonstrated very clearly that future research must be designed in an **interdisciplinary** manner, as mountains are very complex systems. Furthermore it became very clear that stage and problems of the different mountain regions are not similar. Therefore the strategies to face the global change must be defined within the **local or regional context**.

Meeting webpage: <http://bfw.ac.at/mountain/>