ETH
Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

Mountain Stakeholder Workshop

Sectoral stakeholder dialogue activity in ATEAM

Kappel am Albis, Switzerland , Monday 4th to Tuesday 5th November 2002

Organised by

ETHZ, Mountain Forest Ecology Group, Zürich, Switzerland

Potsdam Institute for Climate Impact Research, Potsdam, Germany

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The Workshop

The mountain stakeholder workshop took place during two half days, Monday afternoon 4th and Tuesday morning 5th, November 2002 at the location of Kloster Kappel, an old monastery in Kappel am Albis (Switzerland). Six stakeholders who are professionally concerned with ecosystem services in mountain regions within Europe, such as hydropower, tourism, nature conservation, carbon storage, and forestry, and five members of ATEAM participated in this workshop.

The aims of the workshop were to

- present approaches, indicators, and first preliminary results of the mountain and the biodiversity groups;
- critically evaluate the research results that were achieved so far;
- ensure that the research results are useful for the management of natural resources in European mountains;
- discuss a strategy for estimating the vulnerability of mountain ecosystem services to global change;
- obtain guidance from the stakeholders for the research in the second half of the project.

Fresh Water Supply

Fresh water supply is one of the most important mountain ecosystem services. Potential changes in the seasonal accumulation and melting of snow in a warmer climate and shifts in precipitation patterns could have profound impacts on river runoff, with significant reductions in summer runoff, intensification of winter runoff, and a shift of peak flows to earlier dates. The retreat of glaciers also affects river runoff. This impact currently is positive, because the accelerated melting of glaciers leads to higher summer runoff. However, once the glaciers are reduced, summer runoff will decrease.

Stakeholders indicated that changes in runoff and water supply might strongly impact various water-related sectors. The fact that winter runoff is likely to increase and spring and summer runoff probably will decrease could benefit the hydropower industry, because electricity demand is highest during this period. However, since hydropower enterprises can store surplus water and use it during the low water season, the most relevant factor for hydropower generation is annual runoff. Seasonality of runoff is secondary, as long as runoff is not concentrated during a very short time period, when it would exceed storage capacity.

In contrast to the hydropower sector, the irrigation sector is most interested in summer runoff. Thus, a potential decrease in summer runoff due to the loss of natural mountain water reservoirs in form of ice and snow is relevant to this sector. Especially the Mediterranean area is vulnerable to such changes. To build artificial water reservoirs to compensate for the loss of natural water reservoirs is rather expensive, would need significant advance planning, and is not likely to be an option. In addition, increasing temperatures intensify water demand particularly for agriculture, human consumption, and natural ecosystems.

Carbon Storage

An ecosystem service that is increasingly being recognized as becoming important both ecologically and politically is carbon storage, particularly by forests (cf. Kyoto protocol). First simulation results indicate that mountain regions are potential carbon sinks in particular due to changes in land use.

Stakeholders indicated that they are highly interested in results about carbon storage in mountain ecosystems. Besides carbon in living biota, organic soil carbon is of great interest to stakeholders. However, modeling results regarding soil carbon are not reliable so far. Therefore, we will most likely concentrate research efforts on changes in carbon storage in plants and the associated effects of changes in climate and, particularly, land use. Scenarios for land use change are being developed in collaboration with ATEAM and WSL (Birmensdorf, Switzerland).

Stakeholder also emphasized that implications for carbon storage of large-scale disturbances such as storm damage, fire, or bark beetle are also relevant in view of the Kyoto protocol. These disturbances threaten mountain carbon storage, and make this ecosystem service vulnerable to global change. However, these effects are difficult to handle, as climate scenarios are not very reliable regarding changes in extreme events.

Tourism and Recreation

In the discussion of tourism as a mountain ecosystem service, a number of new concepts and indicators were proposed and discussed. The stakeholders emphasised that tourism is a sector that requires an integrated approach. Tourism relies on various mountain ecosystem services, such as freshwater supply, snow cover, landscape heterogeneity, and protection from natural hazards. Stakeholders indicated that the possibility to build infrastructure is most important for the tourism sector, and thus protection from avalanches, rockfall, landslides and other natural hazards is crucial.

Thus, as a first step, the vulnerability of these basic ecosystem services has to be assessed. This includes

- freshwater supply, which is important as drinking water, but also as resource for artificial snowmaking;
- snow cover as prerequisite for most winter sports;
- landscape heterogeneity as an indicator for landscape attractiveness;
- protection from natural hazards, guaranteeing the accessibility and inhabitability of mountain regions.

It was decided that changes in these services should be interpreted with respect to the implications for tourism as an integrator, and from this the vulnerability of this sector should be assessed. Tourism cannot be treated independently of the other mountain ecosystem services.

It became also clear that an indicator such as “scenic beauty” is not sufficient. A better indicator could be landscape heterogeneity, i.e. the mixture of forests, alpine pastures, lakes, moors, glaciers, etc. A diverse landscape seems to be most attractive to tourists. Therefore, it became clear that a new concept for integrating these features into an indicator has to be developed.

Protection from Natural Hazards

Protection from natural hazards is a crucial mountain ecosystem service, guaranteeing the accessibility and inhabitability of mountain regions. Shifting weather patterns are likely to result in more frequent natural hazards, simply because many locations will experience unusual weather.

The stakeholders from the different sectors identified a large variety of natural hazards that are threatening their sectoral activities: floods, landslides, melting of permafrost, melting of glaciers releasing debris, avalanches, bark beetle attacks, and storms. One concept to approach this sector is to assess the vulnerability of the protection function of mountain ecosystems, particularly mountain forests, to global change. Important indicators could be root carbon, soil moisture, and land use patterns.

Summary and Evaluation

The mountain stakeholder workshop was quite successful and productive. Both stakeholders and scientists were involved in dynamic discussions and mutually learned from each other. We could on the one hand successfully communicate our needs, questions, and preliminary results to stakeholders. On the other hand, we received useful and valuable feedback from the stakeholders. All participating stakeholders expressed their interest to continue collaboration with ATEAM and to participate in future ATEAM stakeholder activities.

During the workshop, it became clear that we have to slightly refocus our project. In the future, we will regard tourism as a ‘secondary’ mountain ecosystem service, which depends on the ‘primary’ mountain ecosystem services such as water supply, protection from natural hazards, and landscape heterogeneity.

Stakeholders also emphasised that it is most important that the scientific results obtained in ATEAM have to be made applicable for stakeholders and non-scientists, and have to be presented in a way that stakeholders can make use of them. Impacts on ecosystems should be translated to impacts on people. The chain of cause and effect is relevant. Also, tools and concepts how to assess ecosystem services can be of interest to stakeholders. It was proposed to mail the resulting report to professional associations with an interest in mountain issues, such as tourist associations, cable car associations, etc.








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