

Title: Global Change Impacts on Mountain Ecosystem Goods and Services

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Summary:

The presentation on mountain ecosystem goods and services was delivered in four main parts namely, (1) why to focus on mountain; (2) sample of sectoral impacts; (3) effects of climate change, wildfire, and management regime; and (4) the cross-sectoral implication. Figures on its terrestrial land surface on the earth, global forest it holds and population of humans depending on mountains highlighted the significance and peculiarities of the mountains. Specific goods and services important for human well being derived from the Alp Mountains as specific example were briefly discussed and these are provision of freshwater, protection from natural hazards, resource extraction, carbon sequestration, biodiversity and tourism.

In addition, a briefly discussion for the protection of human beings from the mountain ecosystems and the land use history (overexploitation, extensification of management, etc) were mentioned.

For sectoral impacts, the runoff regime and carbon storage were among the examples. Effects of climate change, wildfire and management regime were analyzed using modeling. From each model, implications were identified. One of these is the possible development of savanna in the Alps as an effect of climate change. This has also negative implication to farmers and mitigating it by various management regimes will have little impact.

After the presentation, the following discussions were raised:

- Generalization of results to entire Alps and other mountain ranges:
 - Various catchments were studied each representative for one climatic region within the Alps (although not successful for south eastern Alps) -> results are representative
 - Approach can be applied to other regions
- The effect on changes in biomass on water storage was not taken into account.
- High importance of natural hazards to stakeholders (Why don't tourists come to Belgium even if there are no avalanches or other risks?)
 - As soon as the other aspects (snow cover, scenic beauty, etc) are fulfilled to a certain extend, natural hazards are of most prominent concern for stakeholders.
 - Methodology: series of meetings with stakeholders (people living in the mountains), only by-product of research, maybe not 100% waterproof

- Can there be anything done to decrease the risk of wild fires?
 - Future control of fuel load at landscape scale will be very costly
 - Sheep grazing can be effective but is costly
 - Fuel load may be subordinate to climatic drivers under certain conditions
 - Strict fire suppression can cause even bigger fires (e.g. US National Parks)
 - Controlled burning to decrease fuel load has implications for biodiversity and doesn't necessarily prevent fire

- How important is local culture for tourism?
 - Gut feeling: important for significant minority, majority is ignorant

The presentation was concluded that humanity depends on ecosystem goods and services from mountains. Mountains are particularly vulnerable to global change and tourism and recreation are key sources of income in many mountain regions worldwide and should be protected.