

EFC Working Party on the Management of Mountain Watersheds 26th Session

Oulu, Finland, 19-22 August 2008

*Forests, water and climate change in high
altitude and high latitude watersheds*



High latitudes and high altitudes: a comparison

- Climates characterized by seasonal cycles.
- Hydrometeorology controlled by processes involving snow and ice.
- High altitudes: daily cycles, topography and microclimate highly differentiated → changes are harder to predict.
- High latitudes: more homogeneous → even though temperature increase is expected to be higher, impacts are easier to predict.



Impacts of climate change

- Temperature rise not evenly distributed → high latitudes and high altitudes particularly affected.
- Overall predicted trends:
 - more precipitation during the winter months;
 - dryer summers;
 - more extreme weather events and increased unpredictability;
 - enhanced evapotranspiration;
 - up-ward and north-ward movement of treelines → adaptation / extinction of species;
 - losses in biodiversity.



Impacts of climate change (continued)

- High latitudes: extension of growing season (pos.), floods, droughts, more storms, pest diseases to trees (neg.).
- High altitudes: variation in runoff, glacier and permafrost hazards (landslides, rock falls, outburst of glacier lakes) → consequences are expected to be much worse.



Adaptation to Climate Change

- Collaborative and integrated watershed management.
- Policy actions at local, national and global level.
- Raising awareness, transdisciplinary and transnational research, communication and cooperation.



Adaptation to Climate Change (continued)

- Ability for mitigation and adaptation depending on a country's level of economic development → strongest negative impacts in mountain regions of developing countries.
- Well-managed forests → shorter rotation of forest and regular forest management → accelerates the spreading of new, genetically better adapted populations.



Research gaps

- Better comprehension of hydrometeorological processes;
- quantify the role of snow cover;
- strengthening of good monitoring systems;
- development of better and more reliable climate change impact models;
- need for more elaborated disaster risk management tools (also on transnational basis);
- case studies → to improve knowledge of climate change impacts on spatial development and economy.

