

Workshop Output WS 2.1.C

Title of workshop: Long-Term Ecological Research (LTER) Sites as monitoring networks - opportunities and challenges

Prepared by

Moderators	Session Chair: Ulrike Tappeiner Moderator: Georg Niedrist Moderator: Davnah Payne Moderator: Thomas Spiegelberger
Participants*	Boulangeat, Isabelle Kumar, Manish Uniyal, VP Toucher, Michele Lynn Nagy, Laszlo

* Workshop participants that have submitted contributions to the workshop

General questions to please be answered in the workshop reporting

- 1) What was the focus of the workshop? Methodological issues and advancements or thematic issues (systems knowledge, transformation knowledge, target knowledge). Please check and fill in the matrix in the output section.

Methodological issues and advancements	Thematic issues		
	System knowledge	Transformation knowledge	Target Knowledge
X	X		

- 1) **Which key points were discussed in the workshop as a whole? (This should be more a synthesis and not simply a summary of the key points in each presentation)**

The session about Long-Term Ecological Research (LTER) sites and LTSER (Long-Term Socio-Ecological Research) platforms focused on how to deliver scientific expertise on our ecosystems and environment, as well as for the modelling of future scenarios and the development of management strategies facing severe global changes.

During the workshop, we focused in particular on two questions:

1. How can/do LTER sites and LTSER platforms contribute to mountain ecosystem service assessment?
2. How can data quality in a global network, such as LTER, be assured in order to be used, worked with and shared between different sites and platforms for scientific research/investigations?

- 2) **What is your opinion on the current state of knowledge concerning your topic(s) (focusing on mountain regions)? Please check and fill in the matrix on the following page.**

Overall, LTSER has developed a lot globally, also in mountains. During the workshop, the participants mentioned that data availability on ecosystems functioning (hydrology) in particular in regions such as Asian mountains (Himalaya), (South)-Africa mountains could be investigated more.

Data are available but standards are missing to facilitate exchange and comparison.

Ideas for questions to potentially be answered by the moderators after the workshop in the reporting (please delete what is not useful):

1) Were there any new insights and/or findings presented? If yes, which ones?

- A common point was the focus on dry mountains valleys of 4 out of the 5 presentation
- Interdisciplinary database based on municipality data inspired by Ostrum's classification including biophysical potential, management, infrastructures, actors

2) What was the main message/consensus of your workshop?

- LTSER & Ecosystem services
 - The "S" is not yet included enough in the LTER sites, and should be fostered in the future through a better integration between natural and human and social sciences. This will pass by increasing the "trust" between the scientists and the local communities as usually done in studies in social sciences
 - Heterogeneity of the data and the representativeness of the observational unit are still major issues for long-term socio-ecological research
 - Questions of scale in particular between data sets coming from natural science, and social and human sciences
 - Integration of existing data, measurements and modelling are needed using more standardised frameworks to deliver knowledge on ecosystem services status and trends in mountain studies.
- Data question
 - Data sharing is commonly done, but mainly with the scientific community and only on demand
 - Importance of well-documented meta-data is recognized (Dynamic Ecological Information Management System - Site and dataset registry; <https://deims.org/>)
 - Standards for ecological measurements and in particular for ecological functions are not defined as done by WMO for meteorological data

3) Were major uncertainty issues identified and discussed? If yes, which ones?

See above

4) Were new research questions raised? If yes, would working on these questions need to involve other disciplines (which ones)?

- How to harmonies the data acquisition between natural science and from human & social sciences which is already within natural science/, but even more heterogeneous if comparing data coming from natural sciences AND human & social sciences

5) Did the workshop identify research topics (e.g. environmental drivers other than climate) that are, in your opinion, currently greatly underrepresented in mountain research, but should urgently be addressed?

- Ecohydrology data are sparse in particular in “underrepresented” regions such as Asian mountains (Himalaya), (South)-Africa mountains.