

Interactive comment on “Climate change and mountain water resources: overview and recommendations for research, management and politics” by D. Viviroli et al.

M. Zappa (Referee)

massimiliano.zappa@wsl.ch

Received and published: 21 June 2010

The paper by Viviroli et al. introduces a HESS Special Issue on "Climate change and water resources management in mountains".

The authors summarize the discussions they had during a Workshop dedicated to the topic they present.

It is a 360 degree view on a very relevant research field that is experiencing rapidly growing significance for humanity. The choice of topics is very broad. The authors are well aware of not covering all possible topics, but the topic they touch are very well

C1225

described and perspectives from different countries are given and discussed.

The ideas and literature are up-to-date and most relevant.

I have two "major" points (not meaning "major revision") where I really ask the authors to improve their manuscript and some minor points where I give some considerations that could also addressed in a second version of the manuscript.

1st Major Point. Figure 2 is very central in the discussions presented here. The only quantitative measure is WRC, which is useful for a process oriented characterization of the different mountainous regions. The other measures are "expert-based" assessments relying on sets of questions. It is for me very needed to include supplementary material in order to trace how these measures have been finally translated into points and ranges for the shown graphs.

2nd Major Point: In many points of the manuscript you write sentences that let me think about the WMO initiative GCOS/WRCP (Global Climate Observing System and the World Climate Research Programm, <http://www.wmo.int/pages/prog/gcos/index.php>). I think GCOS is a structure already offering a platform for increasing the awareness on long term monitoring of key elements of the climate and hydrological system (including cryosphere). Most prominently you could describe GCOS on Section 4.2 (Page 2858, Lines 25-28) and short before your concluding remarks on page Page 2872, lines 14-17.

Further inputs for discussion:

On section 3.1.3 (Pages 2841-2842) and related Section 4.1.1 (2851-2852): In the daily business of research teams address the "climate impact on ..." topics (yo can substitute "..." with glaciers, low-flows, food-security, water resources, landscape and many other terms). I feel a growing need for coordination in the selection and use of climate projections at the regional scale. A growing number of scenarios are available. Several teams make research on the same test-area with different baselines, emissions sce-

narios, scenario periods and model chains (GCM-RCM-DOWNSCALING). What IPCC is doing at the global scale should be also made at the continental and national scale by centers being able to give some consulting to the end-users of such projections (e.g.: <http://www.c2sm.ethz.ch/>). Nobody needs a plethora of impact-studies at the regional that cannot be compared each to other.

On section 3.1.4 (Pages 2843) and related section 4.1.3 (2854): The need of soil maps is mostly needed to improve the hydrological model, by reducing uncertainty in the parametrization of conceptual approaches that would really benefit from sound information on soil depths, dominant runoff processes, porosity, wilting point, field capacity and hydraulic conductivity to only cite some of the needed physical values in hydrological modeling and other research areas. Soil information needs also information for evaluation models. I miss here a statement on the importance of increasing the networks of soil moisture observations (including satellite, e.g. SMOS)

On section 4.2.3 (Page 2863) Here I miss some visions on the use of remote sensing products. Many resources have been assigned to programs aiming at obtaining data from the space (TRMM, SMOS, AVHRR, ...). A running (high-resolution) monitoring of water resources from space is science fiction or the way to go?

Technical point: Page 2847, line 23: You should maybe give the full meaning of the OECD acronym.

Finally. I warmly recommend the publication of this paper after minor revisions.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 7, 2829, 2010.