

## Current and Future Global Water Scarcity and Remained Questions

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This session was originally planned as the 2nd Session in the first day. The role of my presentation was intended to introduce the so-called “world water crisis” based on recent global water resources assessment. However, due to a couple of reasons, the session 2 and the session 8 were exchanged. Drs. Petra Doell and Naota Hanasaki will introduce us water scarcity and water crisis. Thereby, the target of my talk should be slightly modified from the original plan.

This presentation will introduce several questions to which hydrologists should answer in the near future in terms of global water scarcity and global water quantity change. Or, it is better for me to say as follows; I assume that people and society expect hydrologists to answer these questions. The questions are as follows.

- i) Current physical water scarcity, defined by the combination of water withdrawal and supply or by the Falkenmark index, is apparent in the regions like the middle and western part of North America, the lower reach of the Yellow River basin in CHina, Indus, Western Asia, and so on. Future water scarcity was also estimated by several researchers. However, the water scarcity index never tells us whether such regions and the world itself are sustainable or not (in terms of water).
- ii) In addition, the future projection of water scarcity is much dependent on the future projection of water withdrawal(/demand/use). However, relatively less attention is paid to the uncertainty in the projection of future water withdrawal than uncertainty in the projection of future hydrological cycle.
- iii) Even though the projection of future hydrological cycle due to so-called global warming is a hot topic of many researchers, “reliable” and “useful” projection is not published yet from the viewpoint of ordinary people and policy makers. Also, a big question in the society is “such a change is already observed?”
- iv) Because it is not easy to build large-scale hard-infrastructures in these days, soft measure is highlighted as countermeasure to water scarcity. However, feasibility of soft measure is not certain for coping with world water scarcity. Also, virtual water trade, a kind of soft measure, has become famous but the utility of VW trade on water crisis is not well understood.

Few more questions may be added. Actually, I have no answer to these questions. In addition, I am not sure whether these questions are relevant/feasible. There is possibility that these questions are biased because of my personality, background, experiences, living-place, and so on. Any comment is welcome for future fruitful studies of hydrology.