

# ***Interactive comment on “HESS Opinions: A Planetary Boundary on Freshwater Use is Misleading” by Maik Heistermann***

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Received and published: 24 March 2017

I would like to thank Prof. Sivapalan for his comments which I perceive, in general, as positive.

I will not reiterate the many points on which I agree with Prof. Sivapalan. Instead, I will only respond on the key issue I disagree with.

We tend to hesitate in appreciating criticism that is expressed without constructively formulating an alternative approach. The present opinion paper lacks such a constructive approach, and Prof. Sivapalan accordingly demands the outline of an "alternative way forward". I disagree with this demand, and in the following, I'll explain my reasons.

I think we do not have to go as far as Popper's scientific theory, according to which

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scientific progress is based on falsification. I would, however, like to insist that rejecting the planetary boundary on freshwater use is justified *in itself*. In the manuscript under discussion, I express the view that the idea of a freshwater PB is not only scientifically flawed, but could seriously mislead policy choices. To put it in simple terms: I am convinced that we're better off without the freshwater PB - even if it was not replaced by an "alternative way forward". I'd prefer *not* to obliterate that main message of the paper by embarking on a fundamental discussion of water management frameworks.

Having said that, however, I am optimistic that we might agree that alternatives already exist. Putting behind us the notion that regional water stress can trigger global disaster, we are still faced with the challenge of sustainable water resources management, and there is a lot of reasonable guidance and conceptual framing towards this challenge. Thus, I do not see the necessity to "board" the idea of a "safe operating space" and somehow transform or adopt it to the local or basin level. Instead, I would like to leave the issue by referring to one of the most enjoyable reads on water resources management I've had in the past years: In his paper on the "ABCDE+F" framework, C. Perry (2013) lays out the components he considers as crucial for an effective water management - "effective" meaning that "the outcome [...] is consistent with the declarations of policy made at the relevant level of administration." According to Perry, "effective" does not necessarily mean "good" - a term that expresses certain preferences which *might* be transient: "[...] privatization, for example, was rarely mentioned 20 years ago, was universally promoted 10 years ago, and now appears to be in decline."

In the "ABCDE+F" framework, hydrology comes into play in the "A" part which stands for "Accounting" (for the available resources). This accounting needs to be based on our best knowledge, combining local and regional expertise with state-of-the-art monitoring and simulation technology - and an explicit consideration of uncertainty and knowledge gaps. This is a crucial part, and well worth the attention of IAHS and Panta Rhei. Considering though, that there are also the B, C, D and E components, hydrologists should not be tempted to overrate their role in water resources management.

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Still, the fact that we are just reiterating - in a hydrological journal, in the 21st century! - that the basin scale is the fundamental scale to address water resources issues, puts a spotlight on the current debate. Obviously, there's still some work to do. This work is tedious and complex, and not nearly as attractive as declaring global numbers.

Summing up, I can very well understand Prof Sivapalan's demand for perspective. But again, I have to emphasize that I prefer to keep the focus of this opinion paper on rejecting the freshwater PB. And at any cost, I want to avoid the notion that the idea of a freshwater PB could be somehow tuned or tweaked towards something useful.

Of course, Prof. Sivapalan is right that the PB community is not answerable to hydrologists - and certainly not to a small-time scientist like me. Thus, my first and foremost ambition is to just put my opinion on record. That is one step, and one step only. Step by step, we might see if the debate leads us anywhere useful. Certainly, Prof. Sivapalan's comment was already a very valuable part of that debate, and I would like to thank him again for his effort.

#### References:

Perry, C. (2013): ABCDE+F: a framework for thinking about water resources management, *Water International*, 38(1), 95–107.

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., doi:10.5194/hess-2017-112, 2017.

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