

Interactive comment on “A global water scarcity assessment under shared socio-economic pathways – Part 2: Water availability and scarcity” by N. Hanasaki et al.

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Dear Referee #2,

Thank you for taking time to review our draft paper. The authors are grateful for your useful comments. Most of the points are well taken. We would like to revise text for further clarity as shown below. After receiving comments from all reviewers, we would like to decide how to revise each part.

1) Part 1 (projection of water use) and Part 2 (water resources assessment using the projected water use) are closely related each other but two independent papers. There-
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fore, introduction and literature review sections are indispensable for both papers. However, we would like to examine redundancy of information and try to shorten text as much as possible.

2) Future water scarcity is influenced by both anthropogenic climate change and socio-economic change. Because the mechanisms are different each other, it is effective to analyze them separately. We analyzed the impact of climate change in Section 4, and both climate and socio-economic change in Section 5. This explains why there are two Results sections. This structure is already explained in the paper, but we would like to further revise text for clarity.

3) The WWR index has been widely used in earlier water scarcity assessments. However, as clearly shown in this paper, it causes problems when it is applied to climate change impact assessments. We solved this problem by using the CWD index. This logic is not clearly mentioned in Abstract in the current form, we would like to add this.

4) As Reviewer 2 pointed out, the CWD index has been first proposed in Hanasaki et al. (2008) and applied to the historical period of 1986-1995. However, the index is first applied to the future period in this paper. This logic is already explained in text, but we would like to revise it for further clarity.

5) In this paper, the term "withdrawal" is used for two meanings. One is abstraction of water from the rivers in our model for consumptive use. The other is water flow going through the water use facilities (e.g. water intake gate) in the reality. The former is used in the calculation of CWD index, while the latter for WWR. This is confusing because the former is usually termed "water consumption" as pointed out by the Reviewer 2. We would like to define a new term "water abstraction" for the former meaning, and replace "withdrawal" with it throughout text, in order that readers can perfectly distinguish two meanings.

6) We believe the obscurity in technical terms pointed out by Referee #2 would be largely improved by the modification shown in 5). Description on how we estimated

consumption of industrial and municipal water will be also added to text as well.

Sincerely,

Naota Hanasaki (on behalf of all authors)

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 9, 13933, 2012.

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