Responses to Reviewer 3

The authors have done a great job on this research as there are few research articles on this topic (Brahmaputra River & Climate Change). However, reading the paper thoroughly, I find there are room for improvements:

<u>Response</u>: We would like to express our sincere thanks to the anonymous reviewer for the insightful and detailed comments on our submitted manuscript. We have revised the manuscript thoroughly based on these comments, and address them below on a point-by-point basis.

(1) I am not convinced why the authors have chosen 2020-2035 as the climate change period. The impacts of climate change on water resources, that we have been observing worldwide, is very much unpredictable/uncertain in the early stage of 21st century. The precipitation projection within that period is very uncertain (model to model variation). Although the early stage of 21st century may be of interest from the water management point of view, a separate analysis of later part of the 21st century is required to fulfill the analysis. My strong recommendation would be to consider 2071-2100 as well.

<u>Response</u>:

We agree with the reviewer that a longer data period would be the most desirable. Comparing with 1986-2005, global average surface temperature would increase 0.3-0.7℃ under RCP2.6 during 2016-2035 (Ofipcc, 2013). However, the CORDEX experiment for the East Asia domain contained 5 models, which was shown in Table 1 in the manuscript. The time series of these 5 models were shown in Table I. 2006-2100 of HadGEM3-RA under RCP4.5 and 8.5, 2006-2050 of RegCM and YSU-RSM under RCP4.5 and 8.5, 2006-2049 of SNU-WRF under RCP4.5 and 8.5, 2006-2049 of SNU-MM5 under RCP4.5 while 2006-2035 of SNU-MM5 under RCP8.5. To compare more RCMs and more concentration scenarios (RCP4.5 and 8.5), the longest overlap time of these 5 RCMs under RCP4.5 and 8.5 was chosen, that from now to 2035. Thanks!

Table I The time series of these 5 RCMs.

Model	HadGEM3-RA	RegCM	SNU-MM5	SNU-WRF	YSU-RSM
History	1950-2005	1979-2005	1979-2005	1979-2005	1980-2005
RCP4.5	2006-2100	2006-2050	2006-2049	2006-2049	2006-2050
RCP8.5	2006-2100	2006-2050	2006-2035	2006-2049	2006-2050

(2) Brahmaputra (or Yarlung Tsangpo) is a perennial river and the hydrograph (especially at Bangladesh location: Bahadurabad) is very steep during monsoon period resulting a huge variation in wet season flow and dry season flow). The enormous stream-flow during monsoon season causes flood in the lower riparian countries (like Bangladesh). The authors only considered mean annual stream-flow in their analysis while an analysis of maximum annual flows are essential for the completeness of the study.

_Response__:_ The revised manuscript will give expressions to the Reviewer's suggestions about floods. Figure I shows the mean projection (red line) and 90% uncertainty interval of BMA during the historical period at Bahadurabad. The uncertainty was larger than annual water resources. Results showed that floods were significantly underestimated because of no matter hydrological model or driven dataset. Thanks!
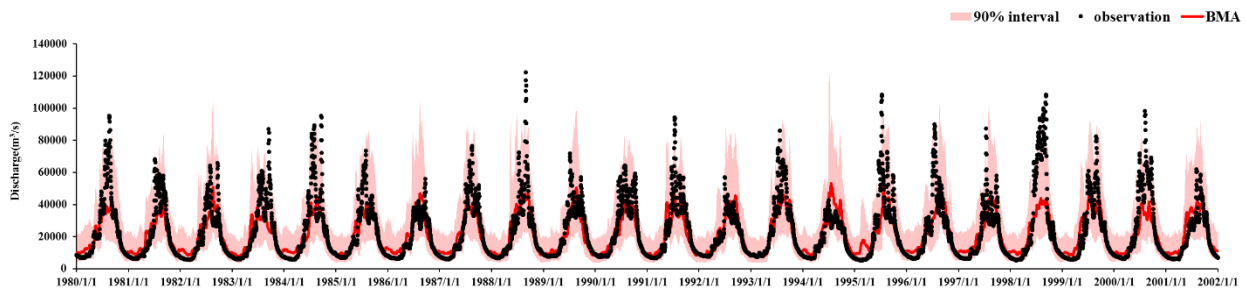

Figure I. The mean values and 90% uncertainty interval of streamflow simulated by the BMA method during the historical period.

References:

Ofipcc, W. G. I.: Climate Change 2013: The Physical Science Basis, Contribution of Working, 43, 866-871, 2013.