Hydrol. Earth Syst. Sci. Discuss., 12, C3299–C3301, 2015
www.hydrol-earth-syst-sci-discuss.net/12/C3299/2015/
© Author(s) 2015. This work is distributed under
the Creative Commons Attribute 3.0 License.

Hydrology and Earth System Sciences
Discussions

Interactive comment on "South Asia river flow projections and their implications for water resources" *by* C. Mathison et al.

Anonymous Referee #2

Received and published: 26 August 2015

Paper: South Asia river flow projections and their implications for water resources, C. Mathison et al. (HESSD 12, 5789–5840, 2015) The paper falls within the scope of the HESSD, and have sufficient matter to appeal the international readers of the Journal. The authors have studied streamflow projections in different river basins originating from the Himalaya, mainly Indus, Ganges and Brahmaputra. In the study, the ERA-Interim and two global climate models (GCMs) were downscaled using a regional climate 15 model (RCM) for the periods; 1990–2006 for ERA-Interim and 1960–2100 for the two GCMs. The RCM river flow was routed using a river-routing model in the study. It is an interesting work and is suitable for possible publication in the prestigious Journal. However, the authors may incorporate the following suggestions/comments in their paper. The comments/suggestions are as follows. 1. The authors have used

the river flow rate for 12 gauges. Is it possible to include the virgin flows in the study including the river-routing model? The readings at GD sites may be affected by the dam affect (storage) and withdrawal of water to meet out the various demands. The study based on the virgin flows may provide some more useful information during the study. 2. Results indicate an increasing trend in annual mean river flows. Jhajharia and Singh (2011) have reported increasing trends in temperature in parts of northeast India in monsoon and post-monsoon seasons. Some of the sites are situated in the Brahmaputra basin, and thus the results of Jhajharia and Singh (2011) may be discussed in the present paper in the above context. 3. The precipitation patterns for each basin are useful for understanding the changes in the river flows. The authors are encouraged to read a paper on changes in rainfall, rainy days and 24 hours maximum rainfall over humid sites of Assam, one of the important states of NE India (Jhajharia et al. 2012). The paper discusses the trends in above parameters using the rainfall data of 24 sites situated in and around the Brahmaputra basin. The authors may discuss the results of this study in view of their own results. Rainy days were found to be decreasing at most of the sites located in the Brahmaputra basin (Jhajharia et al. 2012). 4. "These simulations the Ganges/Brahmaputra catchment shows an increasing trend in total precipitation". Jhajharia et al (2009 in Agri. For. Met., 2012 in Hydr. Process.) studied the changes in evaporation and evapotranspiration in humid climatic conditions of northeast India. The results of these studies may also be discussed in support of the observations during the analysis of the present study. They have reported the concurrent occurrences of Epan decreases and rainfall increases were found at Agartala in winter season and at Chuapara in yearly and pre monsoon season. 5. McVicar and others (JOH, 2012) in their global review paper have reported that evaporation/ET have decreased over different parts of the globe, mainly due to the significant reduction in wind speed followed by radiation. The review paper contains a few important studies for the three river basins selected in this study. The authors are suggested to read it and may cite as well. Second, evaporation may play an important role in water budgeting. By including evaporation in the analysis, these observed decreases

in evaporation/ET in the three basins may have positive influence on the water availability in the Himalayan region. Overall, the paper, if accepted for publication, will be a good addition to the literature for an important region supporting one billion population and one of the most bio-diversity rich region of the world (with some of the remaining rainforests of the region).

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 12, 5789, 2015.