Risks of seasonal extreme rainfall events in Bangladesh under 1.5 and 2.0degrees' warmer worlds – How anthropogenic aerosols change the story by Rimi et al.

Introduction

The introduction provides a general background on the research topic with clearly stated objectives and research question. The author divided whole Bangladesh into four sub-regions (page 3, line11-14) to evaluate the risk of extreme rainfall events. Are there other specific reasons for to divide into four reasons like climatological variation or any other previous study used these sub-regions. A standalone Figure of Bangladesh including the four sub-regions could be useful with mean seasonal rainfall. Line 16 page 2 – In June 2017, heavy rainfall killed at least 156 people (needs a citation).

Data and Methods
Model setup and experiment design

The wettest and driest years are not well presented in the Table S2. Is it range of years or individual year? Classification of wet years and dry is not clearly mentioned. It has been mentioned that spatiotemporal average of rainfall has been used here. Is there any threshold for the classification of wet period and dry period? In Bangladesh flooding years are considered as wet year during monsoon. This need to be made clear.

Results and Discussion
Section 3.1 Model Evaluation for Five day mean rainfall

"Five day mean rainfall is used to represent the timescale responsible for river flooding as opposed to daily extremes that cause flash floods primarily in the pre-monsoon season." Is the 5 days rainfall causes flooding or 1-day extreme rainfall causes flash flood in Bangladesh and what is the intensity of rainfall termed as extreme (what is the amount of rainfall mm/day considered as extreme value)? Citation may clear this statement.

Fig.1 represents annual cycle of the four sub-regions in Bangladesh and results of the five models (ACT, NAT, GHG, HAPPI 1.5 and HAPPI 2.0) show maximum rainfall occurs in June. June to September is the monsoon month and June is the month of monsoon onset. Usually, July is the maximum rainfall month in Bangladesh. Do the results indicate any shifting of monsoon timing Due to the monsoon climate, the overall variation(interannual) of rainfall in JJAS months (seasonal) is not quite high. Bangladesh has almost similar pattern of monsoon

precipitation in the JJAS months. Underestimation by 25-65% is quite high. The bias and uncertainty within these values is very high. The authors need to explain the reasoning for this a bit more.

Section 3.2: Impact of Climate Change and Aerosol Reduction on Seasonal Mean Rainfall
Provides important information regarding rainfall change due to warming 1.5˚C to 2˚C and aerosol impact. However, the change has been computed using model based on simulated observed data. The actual changes can be presented by using observation data (e.g., Aphrodite).

Page 7 line23 -24
"While aerosol effects are consistent with other regions, the GHG induced rainfall is hampered, likely due to dynamic changes such as a delayed onset of the monsoon in response to warming", It can be supported with other relevant studies (e.g. the variation of interannual rainfall may depend on the onset of monsoon).

3.3 Rainfall extreme:
Line 40, papge7
"The signal-to-noise ratio is higher in the monsoon season across all sub-regions with the lowest and highest ratio in sub-region 1 and 3, respectively (Figs. 8a & 9a)". This statement may be needed further explanation.

Reference
The author referred Banglapedia, 2012 as citation in page 2 line 10. However, did not provide in the reference list.

Other comments:

(a) The title of the paper says risks of seasonal extreme rainfall events and presented rainfall extreme using daily and five day mean rainfall. One day max and 5day max would be better presentation of rainfall extreme. It is also necessary to have a better description why daily and five day mean rainfall has been used.

(b) Inconsistent in figure indexing spacing: In the results (e.g. Sect. 3.2) it is needed to be consistent with spacing when referencing to figures. For example, Fig.2 d and (Fig. 2d), (Figs. 8a & 8b) and (Fig. 4 a & c).

(c) The Figure captions are too long. The author started to describe the results in some of them (e.g. Fig. 5). The results or discussion should be in text. Caption should be concise and just define what the Figure shows with the necessary information to gather information from it.

(d) Line 6 (page 4) – Evaluation of the model for the region was conducted by Rimi et al. (under review) and demonstrated a reasonable agreement between model results and observational datasets for extreme rainfall events.

What is a reasonable agreement? Which statistical skills show general agreement (e.g. r^2, KGE). For example, 60% of stations achieved values greater than 0.6 between modelled and observed data.

The discussion article '**Risks of seasonal extreme rainfall events in Bangladesh under 1.5 and 2.0degrees' warmer worlds – How anthropogenic aerosols change the story**' by Ruksana H. Rimi et al. is very interesting focused on the extreme rainfall events due climate change particularly 1.5 and 2 degrees warmer world. This is a comprehensive analysis of future projection of multi model rainfall over several sub-region of Bangladesh. The author provides sufficient graphs and maps in the article which explained the results. The major findings of the article are related with the global warming and its implication extreme weather events for Bangladesh.

Finally, I suggest that the author will consider the above comments in finalizing the script. The article is recommended to publish with minor correction.