Compliance to reviewer (RC1) comments

Q1. I was not able to identify any relevant contribution in this work.

Reply: In this work, we used ARMA model and Copula models to find out which model is best for capturing information between pre-monsoon and post-monsoon outflow at Farakka. Before arriving at the partioning of discharge data into two series of six months, we also attempted partioned series at different lags. Table below shows the performance of Copula when different series having varying lags are used.

Sr. No.	Arrangements	MSE	AIC	BIC
1.	Lag 1	0.0387	-57.724	-56.067
2.	Lag 2	0.121	-34.945	-38.944
3.	Lag 3	0.3815	-11.94	-10.29
4.	Lag 4	0.2465	-20.68	-24.72
5.	Lag 5	0.2942	-17.140	-15.48
6.	Pre-monsoon and Post-monsoon	0.00156	-121.98	-120.32

Needless to say, the scheme at Sr. no. 6 performs better than the rest. It is for this reason that we opted the partitioned series at serial number 6
Finally, we conclude that performance of copula is better than ARMA for any set of series Due to international disputes between India and Bangladesh only 25 years discharge is available. For rainfall modeling similar type of study is done by several researchers, one of such kind is given below.

"Ghosh, S. (2010). Modelling bivariate rainfall distribution and generating bivariate correlated rainfall data in neighbouring meteorological subdivisions using copula. *Hydrological Processes*, *24*(24), 3558-3567."

Q2. One obvious drawback of the manuscript is its poor English and lack of attention to details that convey the impression of unfinished work.

Reply: Thanks for kind suggestions. Grammatical errors are corrected in revised manuscript.

Q3. Tables and illustrations have not been properly prepared.

Reply: Tables and illustrations have been improved in revised manuscript.

Q4. My first objection is related to how the research problem is formulated. Apparently, the Copula and ARIMA models have been applied to an existing dataset with the only purpose of fitting a model to the data. In my opinion, this is not a correct focus. The reason to apply any model is to solve a specific problem through its predictive capabilities.

Reply: The data on Ganga river is classified and therefore, there is a need to develop models which can help in generation of data. We also attempted to relate outflow data with the catchment precipitation but no well defined trend was conceived. To generate outflow from Farakka which is relevant to India as well Bangladesh, some mechanism has to be worked out. Reservoir routing is also not feasible as inflow data is classified. Thus, a classical hydrology based approach is not feasible. For this reason, recourse to statistical approaches was taken and two popular modeling strategies based on COULA and ARMA are explored in this paper to identify the suitable model for outflow generation. Obviously, the Copula model shows better predictive capabilities. Location of Farakka barrage is shown in Google map.

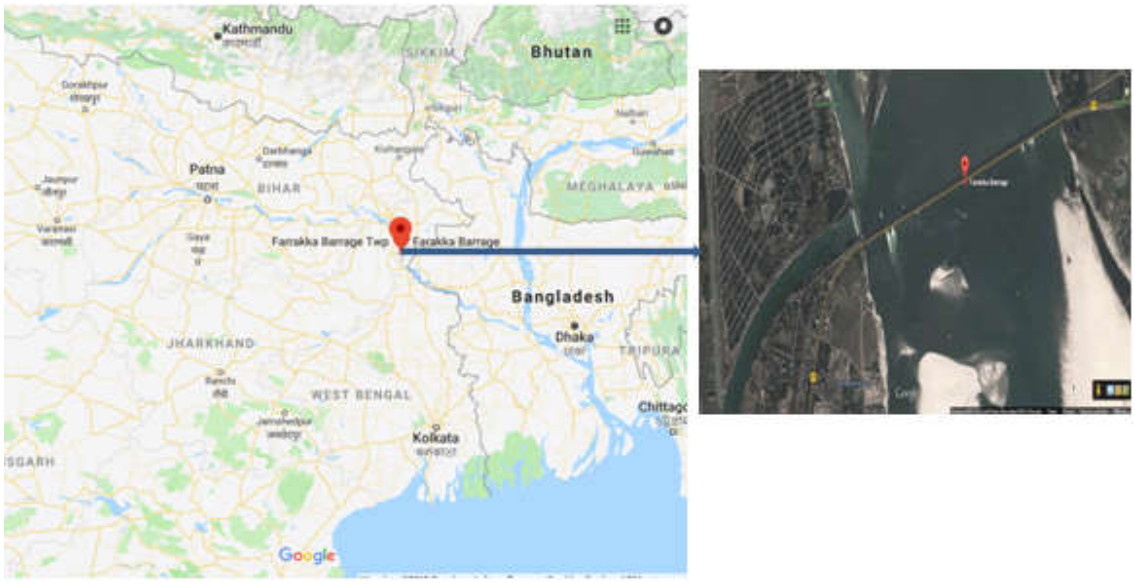

Figure 1: Google image and loaction of Farrakka barrage.

Q5. Copula and ARIMA models have been applied to an existing dataset with the only purpose of fitting a model to the data. In my opinion, this is not a correct focus. The reason to apply any model is to solve a specific problem through its predictive capabilities. In the manuscript, the models are calibrated (the parameters are estimated) for a certain set of available data (several years of outflow from the Farakka reservoir) and then they are tested for a different set of available data.

Reply: Parameters of Copulas and ARIMA models are calculated with the help of available data set after that these models are checked using several model selection criteria (in revised manuscript) and other tests are also performed prior to model selection. The selected model is used for data generation.
Dataset from 1949 to 1968 are used for calibration and data from 1969 to 1973 are used for model validation.
Q. The authors do not provide any indication of why they are fitting the data ad which problem they are intending to solve.

Reply: Please see reply to Questions 1 and 2.

Q6. The fact that the data set covers the period 1949-1973 is really surprising. Why is the dataset so old? Why was this particular reservoir chosen for analysis if it has no new data since 1973?

Reply: Farakka barrage is located nearby Bangladesh, due to international dispute due to water sharing, government releases limited information.

Q7. For instance, on table 2 the authors apparently select the Generalized Extreme Value for the marginal distribution of pre-monsoon and post-monsoon discharges. However, they are dealing with monthly values and it is surprising that the best fit is obtained for an extreme value distribution.

Reply: Generalized extreme value for marginal distribution of pre-monsoon and post-monsoon discharges is selected based on MSE, AIC, and BIC. We also tested it further using inflow data at another site in river Ganges.
(Gain, A., & Giupponi, C. (2014). Impact of the Farakka Dam on thresholds of the hydrologic flow regime in the Lower Ganges River Basin (Bangladesh). *Water*, *6*(8), 2501-2518.).

GEV distribution performed better than other distributions for inflow monthly series.

Q8. The Copula modeling is even more difficult to follow, since they are applying a bivariat modelling scheme with only one variable: outflow discharge. How is this done?

Reply: We prepare two series of data set, first one is pre-monsoon (December to May) and second one is post-monsoon (June to November) period. So, we have bivariate distribution of discharge data. We also tested series with different lags. The table given in reply to Q.1 shows the performance of partioned series at different lags.

Q9. From lines 155-156 and the axis legends of Figure 9, I gather that they might be discharges in the pre-monsoon (December to May) and post monsoon (June to November) seasons, but how is this done?

Reply: It is done by the R project for statistical computing and graphics software.

Q10. These two series are alternated, not simultaneous. Is there a rationale to assume a dependence structure?

Reply: Dependence structure of for 100 samples are -0.25 and for 1000 samples are -0.15.

Q11. How are the two values of different months coupled? What sense does it make?

Reply: Indian weather is broadly classified into two seasons i.e. pre-monsoon and post-monsoon, variation in river discharge mostly changes in these seasons.

Q12. What would be the use of modeling such distribution?

Reply: This work has application in water sharing between Bangladesh and India. In addition, it can also be helpful to plan measures to mitigate inundation which frequently takes place in Bangladesh. The generated outflow data can also be used as a boundary condition while dealing with any hydrologic modeling in Bangladesh.

Authors would like to thank the reviewer for his useful comments.