Reply to Anonymous Referee #2

I went through the manuscript. Generally, the manuscript has been well organized.

Response: We thank you very much for reviewing the manuscript and giving the positive comment. The following are our point-by-point responses to your comments.

1. P1, L6, In abstract the authors stated that "The impacts of climate change and human activities make accurate inflow prediction increasingly difficult, especially for longer lead times". As far as I know, the climate change deals with long term trends, say the climate variation over 20 years. I cannot understand relevance of the abovementioned with climate change impacts and human activities.

Response: Thank you for your careful review. Climate variation affects the streamflow directly. For example, changing precipitation patterns and intensity, together with changing temperatures, will greatly modify the streamflow. Human activities such as land use change, water withdrawal, and hydraulic structures have substantial impacts on streamflow. We fully approve that climate variation and human activities can generate large effect to streamflow of medium and long term. For short term streamflow forecasting, climate variation and human activities also have some effect, so we need to calibration parameter according to meteorological factors.

Proposed changes to manuscript: N/A.

2. The authors have to clearly indicate which model was developed for the inflow forecasting. At first they have to demonstrate if they used conceptual models or data driven models. What is the advantage of the developed model?

Response: Thank you for your careful review. The gradient boosting regression trees is used to forecast daily streamflow. The model is a data driven model. GBRT has two other advantages. Firstly, GBRT can rank features according to their contribution to model scores, which is of great significance for reducing the complexity of the model. Secondly, GBRT is a white box model and can be easily interpreted.

Proposed changes to manuscript: The more details and advantages of model developed will be given in Section 3 of the revised manuscript according to your suggestion.

3. The input selection for multi-day ahead forecasting should be discussed according to available literature. It is essential why the input structure of the longer period is not updated following literature the earlier stage forecasts.

Response: Thank you for your careful review and suggestion. We have carefully reviewed more literatures about the input selection for multi-day ahead forecasting. There are mainly two strategies that you can use for multi-step forecasting, Static (Direct) multi-step forecast and Recursive multi-step forecast (Taieb et al., 2012). Recursive forecast strategy is biased when the underlying model is nonlinear and is sensitive to the estimation error, since estimated values, instead of actual ones, are more and more used when we get further in the future (Bontempi et al., 2012). Thus, the Static multi-step forecasting strategy is employed in this paper. Since the Static strategy does not use any approximated values to compute the forecasts, it is not prone to any accumulation of errors. The model structure of one-step and two-step forecasting of Static strategy is listed below (as shown in Section 3.4) which has different model parameters.

$$prediction(t+1) = model1\big(obs(t-1), obs(t-2), \dots, obs(t-n)\big)$$

$$prediction(t+2) = model2(obs(t-1), obs(t-2), \dots, obs(t-n))$$

where $obs(t-1)$ is the observation value at the $t-1$ period and $prediction(t+1)$ is the predicted value of one-step at the t period.

Proposed changes to manuscript: More details about multi-step forecasting will be shown in Section 3.4 of the revised manuscript.

4. Literature should be updated discussing on more papers addressing multi-step ahead forecasting.

Response: Thank you for your careful review. We have carefully reviewed more literatures from HESS, JH and relative journals about multi-step ahead forecasting.

Proposed changes to manuscript: We will review multi-step ahead forecasting in Section "Introduction" of the revised manuscript and the more references about multi-step ahead forecasting will be updated in Section "Reference" of the revised manuscript.

5. The authors employed gradient boosting regression trees as an ensemble framework. More explanations required about ensemble members.

Response: Thank you for your careful review and suggestion. The ensemble member is the decision tree model.

Proposed changes to manuscript: More details about ensemble members will be given in the revised manuscript.

6. Uncertainty analysis should be carried out to show how much the predictions are confident. As the lead time increases, the metrics reveal errors are increasing drastically. Moreover, high uncertainties are expected to associate with such models. Please discuss this issues accordingly.

Response: Thank you for your careful review. We agree that uncertainty analysis in predictions is significant. As far as we know, medium and long-term forecasting is more uncertainty, for example, monthly or yearly. This paper focuses on improving prediction accuracy by developing new model and importing ERA-Interim reanalysis data and aims to providing reference for reducing discard water. The uncertainty analysis of medium and long-term inflow forecasting will be further studied in the next study.

Proposed changes to manuscript: N/A.

7. Concerning inflow predictions, please indicate efficiency of the proposed model to simulate and predict extreme values which are of great importance.

Response: Thank you for your careful review and suggestion.

Proposed changes to manuscript: We introduce peak flow criterion to evaluate the performance of catching extreme values for developed model and more details will be given in Section 3.4 of the revised manuscript.