Authors' response to comments by Reviewer #1:

We have carefully read and thought about the comments. Firstly, we thank the reviewer's comments. For the enumerated problems and suggestions by the reviewer, our responses are as follows:

Comment: This paper presents a case study of water resources management and ecosystem service protection for a major basin in western China. While the case study is of potential interest, the methods used are standard, and there seems to be no methodological innovation or research interest.
Reply: The afforestation of China has drawn worldwide attention in recent years. But now a small fraction of researchers begin to question water availability under such large-scale tree-planting actions, especially in arid regions (e.g. Loess Plateau, Tarim Basin). Therefore, we used some standard methods to verify our first important result: current water availability is not able to support afforestation and ecosystem protection in a sustainable way in the largest inland river basin in China. Such results give warnings to local decision-making and policies. We think our results shall be interesting to certain governments, public and scientific communities. Another innovative part of our study is to combine hydrological models with ESs outputs. We used fuzzy logic, equations and expert knowledge, and complied them with C++ programs. We will be happy to add more details in the manuscript in this regard.

Comment: In addition, the paper is a very long way from the standard required for presentation in an international journal such as HESS. A few examples are presented below. There are very basic problems with the presentation of material. For example, the catchment is not defined on a location map, and the area modelled seems to be a particular reach of river, but this is not discussed.
Reply: the catchment is defined on the MIKE HYDRO map view. Because it is a relatively "simple" river catchment with no tributaries, we are not sure if another location map is needed. But more discussions on the basic information about the catchment would be added in the revised manuscript.

Comment: There is no discussion of the relevant climatological or hydrological processes, and any associated modelling challenges.
Reply: thank you very much for the suggestion. Some modeling challenges were already discussed by our previous publications. Besides, it is a big challenge to combine hydrological models with ESs outputs. We have put a lot of efforts on the logics and programming. We also think it is better to add more details in this regard.

Comment: The sub-catchments modelled are not defined, nor is there any discussion of the selection of the boundaries for the modelling, and the boundary conditions. Standard models are used, but there is no discussion of model parameterization, model calibration or model uncertainty, and there is no discussion of the data available to support the modelling.
Reply: boundary conditions, parameterization, model calibration, uncertainty and data availability were already included in our previous publications. But we will think about add more necessary information in this manuscript. Moreover, we think an additional validation process of our ESs model is very necessary. We prepare to add this validation process with our collected data to make our results more reliable.

Comment: Where simulations are presented in Fig 5, the units are not defined.

Reply: this is a mistake in the manuscript. We have revised it. Thanks for the comment.

Comment: The models overlap in scope, but there is no recognition of associated problems and no discussion of how potential inconsistencies are handled.

Reply: we agree the overlapping problems are big challenges and how to handle the potential inconsistencies is very necessary to be added in the manuscript. Actually, we have defined dozens of certain one-way interface between parallel models, and fetch outcomes from more specialized models (e.g. flooding from the MIKE HYDRO and land use change from the DSS). Indeed, more discussions are needed in the manuscript.

Comment: Where the ecosystem services DSS is presented, methods are not defined. e.g.153-155 'Tree species were determined by the fuzzy logic between groundwater level and the flooding of natural vegetation. Apocynum and reed production were influenced by groundwater level, groundwater salinity, and grazing area.'

Reply: the methods of ESS calculations were defined by fuzzy logic and equations. The standard methods were improved by our expert knowledges. More details on the methods would be added in the revised manuscript.

Comment: Certain aspects of the water resources management are unclear. For example, 'ecological gates' are mentioned, without any clear explanation of the physical situation and any associated control rules. There is much vague writing – apart from the lack of definition of modelling methods, terms are used such as line 83 'a huge amount of investment'. In addition, the discussion of the regulatory context is presented as quite partial and subjective, rather than objective –e.g. 'Due to government determination and the aspiration of the people, a new era of ecosystem protection has been predicted to emerge in China…...'

Reply: indeed, all the listed problems are necessary to be revised. Explanation of physical situation and control rules on ecological gates have been added in the manuscript. 'a huge amount of investment' has been changed into 'investment of over 4 trillion RMB'. 'government determination' has been changed into 'government policies', and 'the aspiration of the people' has been changed into 'public participation'. Besides, we have found another three parts with vague writing and subjective problems. We have revised them in the manuscript. Thank you very much for the comments and suggestions.