Hydrology and
Earth System
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Interactive comment on "Comprehensive evaluation of water resources security in the Yellow River basin based on a Fuzzy Multi-Attribute Decision Analysis Approach" *by* K. K. Liu et al.

K. K. Liu et al.

chunhuili@bnu.edu.cn

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Title: "Comprehensive evaluation of water resources security in the Yellow River basin based on a Fuzzy Multi-Attribute Decision Analysis Approach"

Authors: .K. Liu, C.H. Li, Y.P. Cai, X.H. Xia, and M. Xu.

We thank the reviewer of our above-referenced manuscript. The following letter gives

our responses to the comments.

Point-by-Point Responses to the Reviewer's Comments

1. The authors gave a detailed indicator system and their corresponding explanations for water resources security evaluation as Table 1 shows. Although there are a great many indicators, more explanation on how/why to choose these indicators should be added in the text.

Response: we agree the suggestion and will added the explanation on how/why to choose these indicators in the revised manuscript. In fact, in the Tab.1, the indicator meaning can explain the indicators (D) which be included to the upper level indicator (C).

2. How to determine the standards and the weights of each indicator? Need more explanation.

Response: Page 7,line 3-10,we give the standards determination." The evaluation criteria of the Yellow River basin has only a relative sense, we took the national data as a benchmark to set the evaluation criteria. The main references for 5 determining the criteria mainly include the statistical data, relevant standards, norms, procedures, development plan, existing research results and so forth. In this paper, five interval evaluation criteria have been formulated, followed by absolute security, security, critical security, insecurity and absolute insecurity. Based on the evaluation criteria, the standards of the evaluation system were determined which were shown in Table 2." Page 7, line 10-13, we gives the weight determination." Fuzzy analytic hierarchy process (FAHP) is adopted to determine the weights of indicators and the calculation steps are the same as in the establishment of the water resources security evaluation indicator system. The weights of indicators were also obtained which were shown in Table 3." We use FAHP method to determine the weight.

3. More advantages of FMADAA should be added in the text.

Response: Since Multiple Attribute Decision Making (MADM) in the aims to select the best alternative for decision-makers, it can also be used to deal with other decision problems. That is to say, various alternatives can be ranked according to certain criteria. The Fuzzy Multi-Attribute Decision Analysis Approach (FMADAA) is the developed MADM method, it was one effective method for multiple criteria decision support.. Because ranking results of different methods are inconsistent in practical application, the results are also integrated in FMADAA which make the evaluation more rational and scientific. In addition, fuzzy information usually encountered in practical evaluation process can also be dealt with in FMADAA, so the process of uncertainties is more rational.

4. The authors adopted many methods in this paper. Suggest a ïňĄgure that can summary these methods and their corresponding use to make the idea of evaluation clear.

Response: thanks the suggestion, we will add the summary of the methods in the revised manuscript.

5. Improve the overall quality of this paper. There are many long sentences that make them vague to understand.

Response: thanks for you suggestions, we will improve the manuscript.

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