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Interactive comment on "Rainfall-runoff processes in the Loess Plateau, China: Temporal dynamics of event rainfall-runoff characteristics and diagnostic analysis of runoff generation patterns" *by* Qiang Wu et al.

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General comments:

This research examined the runoff generation mechanism at the catchment scale to understand the change in runoff generation based on long-term series monitoring data, which could make fundamental progress in the prevention of flooding hazard and the management of water resources in the Yellow River. The paper presents the research in a logical format and the methods are clear. However, the paper presented in its

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Discussion paper

current form has a number of issues that do not make it publishable at this stage. Therefore, I would recommend make major revision based on the following suggestions.

Answer: Thank you for your encouragement. We have taken the time to think through all of your comments and carefully revised the manuscript as you suggested. Thank you for your valuable suggestion to improve the quality of the manuscript.

Specific points:

(1) The novelty of this paper, in particular the method used is limited in the current version and should be emphasized.

Answer: Yes, the method was not clearly described and it would be particularly emphasized in next version.

(2) Why chose the 5 catchments for analysis and the representative of the 5 selected catchments should be clarified.

Answer: Yes, the representative analysis of the five selected catchments would be added in next version. These five basins have been used in many studies and they are special for the Yellow River Basin to understand rainfall-runoff changing.

(3) The analysis of effect of land use and climate change on the runoff pattern was too simplified, more detailed quantitative analysis is needed to enhance our understanding.

Answer: Yes, more quantitative analysis of land use and climate change are needed for understanding runoff generation changing.

(4) How to consider the heterogeneous of underlying surface and rainfall in the 5 catchments, and detailed hydrological parameters such as infiltration rate is lacked.

Answer: Yes, the five catchments have significantly heterogeneous of underlying surface and rainfall. In this study, characteristics of rainfall-runoff process and catchments were considered by spatial and temporal variability in each catchment. The lacked

hydrological parameters would be supplied in next version.

(5) Line 315 “The effect of antecedent soil moisture and rainfall on the runoff was not considered “Thus, medium and large rainfall events were selected, and 340 runoff events were identified in the five catchments, which did not have large-scale water conservancy project constructions but had implemented ecological protection measures”. This was not exactly true as many check dams have been constructed in the Chabagou, how the runoff was influenced by these anthropogenic engineering measures lacked correspond analysis.

Answer: Yes, this place was not well described. Originally, the effects of check dams and terraced fields were not analyzed. Thank you for this suggestion. These anthropogenic engineering measures and influences on runoff generation would be detailed analyzed in next version.

(6) Ecological recovery has double-side effect on the runoff, is this the reason for runoff reduction in Yellow River or the shift from HOF to DOF need more detailed explanation and evidence.

Answer: Yes, it is a good suggestion. Ecological recovery has double-side effect on runoff generation. There is complicate relationship between ecological recovery and transformation of runoff partitioning. But I have collected some field experimental data in similar regions to explain this effect.

(7) Other minor comments Grammar and spelling mistakes such as P7 Line 143 “developmen”

Answer: Yes, thank you for pointing out these mistakes. I will check for similar problems.

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