1. [The paper describes a mathematical method to attribute a discrete change in runoff to changes in climate and catchment characteristics. The method is directly applicable to common data and yields quite similar results when compared to existing methods. However, it remains open which of these methods is more accurate because there is no data to verify.]

   Response: I admitted that I have not provided data to verify the LI method. However, the method is mathematically precise but the other methods are not, so that it is more accurate than other methods.

2. [Still, there are two interesting and valuable aspects of the manuscript: a) The role of the evolution over time b) Reconciling the existing methods and their assumptions on this evolution]

   Response: Many thanks for your appreciation.

3. [To consider the path of changes is an important aspect and, as the author illustrates, may thus alter the resultant sensitivity to a change. This is important, since this may allow to better assess the vulnerability of a given catchment to global change. The problem is, that there is usually not sufficient data to constrain the evolution of disturbances.]

   Response: I have added a paragraph to discuss the high data requirement associated with the LI method. See line 316-321 for details.

4. [The author uses subperiods of 7 years, where at least the meteorological data provides some constraints. However, the use of shorter periods comes at the cost of potential changes in the catchment water storage, which can then be misinterpreted as changes in catchment characteristics. Figure 6 shows that the temporal variation of the catchment property sensitivity is largest. This might actually be caused by water storage changes, rather than actual changes in the catchment properties. This aspect is not sufficiently discussed in the manuscript.]

   Response: I have added a paragraph to justify my use of an aggregated time period of 7 years. See Lines 322-338 for details.

5. [Although I like that the existing methods are discussed in detail, I strongly recommend that the author better visualizes these methods. An attempt is done in Figure 1, but this must be extended and linked to the other methods.]

   Response: I have revised Figure 1 as you suggested.

6. [Recommendation: Major Revisions. The relevance/significance of the paper must be better highlighted. This requires major changes throughout.]

   Response: Thanks for your comments. I highlighted the relevance in lines 39-43, 81-92, 94-98, 313-316, and 339-349.

7. [Further comments: Overall, the notation should be more consistent (for example

indices)and streamlined]

Response: I have checked the notation throughout the manuscript.

8. [I think that some parts of the paper can be cut. Figure 2b is trivial and can be removed]

   Response: A major conclusion of the manuscript is that the decomposition method is a special case of the LI method. Figure 2b lends direct support to the conclusion so that it is not trivial. I am sorry I do not cut it.

9. [It would be better to describe the decomposition method in a conceptual Figure, similar to Fig.1.]

   Response: I have revised Figure 1 as you suggested.

10. [The catchments with the largest changes in n have a reference period of only 3 years. This is quite short for a reference period.]

    Response: I am sorry that I directly used the data given in Zhou et al (2016). Many thanks for your careful examination, but the data of the catchment NO.10 remains in the manuscript considering the reasons below: 1) the catchment has a high aridity index of 1.5. In dry areas, the carryover of soil water storage between years is relatively small as much of the annual precipitation is evaporated and thus has little effect in altering water storage. For example, a one-year aggregated time period may be appropriate in the semi-arid Loess Plateau (Ning et al., 2017) ; 2) the carryover of soil water storage would result in an overestimated *E*, and in turn an overestimated *n*. The catchment NO.10 had a medium *n* value (1.7) in the reference period, much smaller than the evaluation period (4.2), so that the effect of the carryover of soil water storage should not be significant in the reference period.

11. [Figure 6: It is unclear what is shown here.]

    Response: Figure 6 compares the temporal variability of the sensitivities of water yield to precipitation, potential evapotranspiration, and catchment properties. The boxplot clearly showed that the sensitivities to catchment properties had a much greater temporal variation.

12. [The motivation of the figures 7,8 and 9 is not really clear to me. Please explain or remove]

    Response:

    Figure 7 shows the correlation of the obtained sensitivities with P, E_0, n, and aridity index, for purpose to determine the predictors of the sensitivities.

    Fig. 8 shows that the path-averaged sensitivities can be well predicted over space if having all data of P, E_0, and R.

    Fig. 9 shows the prediction performance in the absence of runoff data as it frequently occurs in practices.

13. [At Line 311-312 it is argued that the timing of precipitation change is important. I did not see this aspect in the results.]

Response: This sentence is problematic. I have removed it.

Reference

Zhou, S., B. Yu, L. Zhang, Y. Huang, M. Pan, and G. Wang (2016), A new method to partition climate and catchment effect on the mean annual runoff based on the Budyko complementary relationship. Water Resources Research, 52, 7163–7177. https://doi.org/10.1002/2016WR019046, 2016.

Ning, T., Li, Z., and W. Liu: Vegetation dynamics and climate seasonality jointly control the interannual catchment water balance in the Loess Plateau under the Budyko framework, Hydrology and Earth System Sciences, 21, 1515-1526. https://doi.org/10.5194/hess-2016-484, 2017.