

## ***Interactive comment on “Effects of cultivation and reforestation on suspended sediment concentrations: a case study in a mountainous catchment in China” by N. F. Fang et al.***

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Point-by-point responses to the reviewer's comments/questions: Dear reviewer #1: General Comment: The manuscript quantified suspended sediment concentration dynamics under the influence of the “Household Contract Responsibility System” and Grain-for-Green projects in China. The paper is well written. The content is interesting and scientifically sound. It is a useful contribution to research in the field of catchment geomorphology. However, the manuscript in current version could not meet the standard of the journal, and moderate modification should be performed. Reply: Thank you very much for your time on our manuscript and the opportunity to revise the work. We

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took these comments and suggestions seriously and addressed each of them in every detail.

Comment1. Specific comments: The results are based on one study case. How the results are anticipated to change for different catchments for other case studies? The authors need to add some text regarding this in the conclusion section to show the scope of this research results. Reply: Thank you for your comment. We added information in the section of discussion. We compared our results with other studies.

Comment2. For the discussion, an objective and open-minded consideration of multiple possible explanations could provide a theoretical dimension and bolster the geomorphic aspects of the paper. Given that speculation about watershed processes is likely the best that can be done, the paper should employ the method of multiple working hypotheses. Reply: Thank you for your comment. Thank you for your comment. We added information in the section of discussion and added more possible explanations.

Comment3. Line 28: The unit of annual suspended sediment yield should be kg. Reply: We have used kg as the unit of annual suspended sediment yield in the revised manuscript.

Comment4. Line 34~35: The standard deviation should be noted for 1990s and 2000s. Reply: Thank you for your comment. We added the standard deviation in the revised manuscript.

Comment5. (Line 110) Line 122: Why the forestland of sub-catchment changed different from the Du catchment? Reply: Thank you for your comment. Forestland changed a lot under the influence of the “Household Contract Responsibility System” and Grain-for-Green projects. Flat land and land near the river are more likely cultivated during 1990s. Farmland with slopes  $>25^\circ$  was restored to forest during 2000s. Thus, the change of forestland was influenced by slope as well as the distance to river.

Comment6. Line 140: At the end of the study area, what about population in the watershed? (number of villages, total population and trend, population density). Reply:

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Thank you for your comment. The study area contains Zhenping county, Zhuxi county, 2/3 of Zhushan county, and parts of Fang county. There are 1002 villages with total population of  $1.9 \times 10^6$  based on the fifth population census of China in 2000.

Comment7. Line 152: Variable D should be italic. Reply: We apologize for our mistake and we used italic in the revised manuscript.

Comment8. Line 172: Please note the threshold values of Mann-Kendall statistical test. Reply: Thank you for your comment. The threshold is  $\pm 1.96$  for significant difference. We indicated the threshold in Figure 5.

Comment9. Line 185: No need indicate excel 2010 and SPSS17.0. Reply: Thank you for your comment. We deleted the information in the revised manuscript.

Comment10. Line 191: Consider use kg as the unit for SSY. Reply: We used kg in the revised manuscript.

Comment11. Line 234: Is 1980-1989 the same as 1980s? please use a uniform expression. Reply: We used 1980s in the revised manuscript.

Comment12. Line 237: "max Qx", add "the". Reply: We added the before max.

Comment13. Line 241: It should be Figure 7. Reply: We apologize for our carelessness. It should be Figure 7.

Comment14. Line 254: Why use 25%, 50% and 75% as threshold? Reply: Thank you for your comment. The thresholds are subjective. Similarly, we can use 33% and 77% as the threshold. However, during rainfall event, large runoff caused by peak flow or low runoff which can load sediment is relatively scarce. Most SSC data were acquired from moderate flow. Thus, we classified moderate flow to have more number of samples.

Comment15. Line 259: Figure 8 presents box plots for SSCz and "SSCx"? Reply: Thank you for your comment. It should be "SSCx".

Comment16. Line 317: "Cultivation or reforestation alter the slope surfaces but do not

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remove gullies and channels. Thus, the max SSCx is greater than the max SSCz". This is speculative and only one of many possible explanations. The difference of the max SSC could be caused by rainfall regimes. Reply: We agree with your opinion. We changed the expression in the revised manuscript: "The max SSCx is greater than the max SSCd (31800 vs. 22400 g m<sup>-3</sup>). One possible explanation is..." (see P13. L329)

Comment17. Line 458, 462, 485 and 489: Delete the ".". Reply: We apologize for our carelessness. We corrected this mistake.

Thank you for your time and instructive advice.

Please also note the supplement to this comment:

<http://www.hydrol-earth-syst-sci-discuss.net/12/C4625/2015/hessd-12-C4625-2015-supplement.pdf>

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