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Hydrology and Earth System Sciences Discussions

Interactive comment on "Spatial rainfall variability and runoff response during an extreme event in a semi-arid catchment in the South Pare Mountains, Tanzania." *by* M. L. Mul et al.

M. L. Mul et al.

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We highly appreciate the reviewer’s comments and see that addressing the raised comments will improve the quality of the paper. Your comments on that the conclusions are too generic is appreciated and for the HESS paper we will improve on this section. The assumptions and uncertainties of the applied methods will also be improved.

Hereby our response to the reviewers comments: 1) We will add a section to the paper about the site selection and relevance to other research, which has been taken place in the same area under the same project (SSI). 2) We will review the order of the re-

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sults sub-sections and improve on the order of the different sections. 3) We consider the 1 March flood a flash flood as the concentration times are extremely short ($<$ 2 hrs), moreover although at the weir site a base flow is recorded in the valley downstream the river bed is dry most of the time and only flashfloods reach the downstream reach of the catchment. 4) As there are two rainy seasons occurring each year in the catchment, the total amount of rain events on a yearly basis is larger than if you look at one season. We will rephrase this sentence. 5) The gauging structures at the two smallest size catchment were completely destroyed by the flood. At the largest scale, a bridge was monitored but no rating curve could be established (high flows are easily missed as they pass by in a matter of hours, and deposition of silts (some times more than 1m) affects the rating curve). We will include a more thorough explanation in the paper. 6) We will include the assumptions and uncertainties of the gradually varied flow calculations. 7) The evaporation and groundwater recharge are the main unknowns in the water balance (we attempted to indicate where the remaining 57% of the rainfall went, 1) evaporation, 2) increased groundwater storage, 3)groundwater leakage to a neighbouring catchment). We will provide a more detailed analysis based on the Penman Monteith equation to estimate the actual evaporation assuming there is not moisture constraint during the wet season. Still unmonitored are the groundwater fluxes to the other side of the mountains and the remaining groundwater storage at the end of the season, which account for the remaining part of the water balance. 8) We will attempt to add a section discussing the ability to transfer the knowledge generated in this catchment to other ungauged catchments. 9) We will check all equations. 10) We will synchronize the naming of the figures. 11) We will improve Fig 5b with the circle, which is missing. 12) We will improve on the readability of Figure 6.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 5, 2657, 2008.

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