

Interactive comment on “Investigating the environmental response to water harvesting structures: A field study in Tanzania” by Jessica A. Eisma and Venkatesh M. Merwade

Anonymous Referee #2

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I agree with the authors' assertions that the literature can paint a rosy picture of sand dams by studying a few successful examples. It is therefore a bit disappointing that only three dams are considered in this study, and also that there is no attempt to understand the communities' perceptions of the sand dams. But nevertheless there is a good dataset, although I disagree with the conclusions.

I am curious as to why FLDAS is selected, there is no justification. It seems to assume that all water loss must be through evaporation rather than considering that there may be leakage from the trapped sand, either under the dam wall or through the river bed. This could help explain some of the results (e.g. p. 8 line 16-18, p. 10 lines 1-4, p. 10

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line 10, p. 10 line 20-21. p. 11 line 2, p. 12 line 16, p. 12 line 19) and would have a big impact on the conclusions. The established literature on evaporation is only referenced right at the end of the discussion (p. 12 line 25)

In order to calculate the storage in the sand dam (p.6 line 30-31), why not just assume that it is fully saturated at the end of the wet season? This could be supported if you observe water ponded on top of the trapped sand.

I am curious as to why the WTMWs were the only attempt to measure water levels the sand dams. Piezometers or even excavated holes in the sand dam could have provided a more comprehensive picture. In my experience observing the water depth in scoop holes that the communities dig can be an excellent indicator of overall water levels, but I don't know if there were present here. I am also not surprised by the results of the macroinvertebrate study. That a dry river bed in an arid region contains no macro invertebrates seems hardly to be a surprise. This methodology seems to be more suited to perennial rivers.

There are results on the sediment grain size (p 7 line 19) but no methodology to measure it.

Other comments: p. 8 line 4 – I am struggling to see how the vegetated cover is correlated to the land slope in figure 3. Could this be confirmed through a statistical test? p. 8 line 8-9 – point 1 is poorly explained, and again on p. 11 line 29-32. A figure would help here. p. 9 line 21-25 – this is hard to follow. p. 9 line 24 – how can soil be assessed properly in advance to avoid this type of failure? p.10 line 31 – by “sub-surface water reservoir” do you mean the underlying aquifer of the trapped sand? p. 12 line 6 – please be more specific on why the stream channel migration is important.

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