

Interactive comment on “Surface and subsurface flow effect on permanent gully formation and upland erosion near Lake Tana in the Northern Highlands of Ethiopia” by T. Y. Tebebu et al.

Anonymous Referee #2

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General comments: The paper describes the surface and subsurface flow effect on gully formation and development and compared the rate of erosion on upland and gully. This study may have significant contribution for the advancement of the science of gully formation and development. Each part of the paper was written reasonably but it needs more clarification on some of the parts.

1. The research method for the upland erosion study was not clear and it is better to describe the size (length and width), design and set up of the erosion/runoff plots and the data collection method you followed on the plots. Especially the method you

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followed to measure interrill erosion was not clear.

2. It would be good to add more literature review on rill and interrill erosion on the Lake Tana watershed as well as on the Nile Basin

3. From your research setups, farmer interviews and the data; one may conclude about surface as well as subsurface flow impact on gully development but may not be necessarily on gully formation and/or initiation. Thus your results as well as conclusion may need to be interpreted with caution.

4. The average bulk density that you used to calculate gully erosion losses on Table 1, page 5255 may need to be indicated somewhere in the paper

5. The gully erosion losses from the main branches in Table 1, page 5255 for the year 1980 to 2007 was 356.4 ton ha⁻¹ (13.2 ton ha⁻¹yr⁻¹ × 27 years) which was less than the 2007- 2008 gully erosion loss (530 ton ha⁻¹), this may need justification.

6. On Page 5257, Table 3, column 4, 5 and 6: how did you measure deposition on upland erosion? What would be the reason for high deposition rate to be observed on tef plots?

7. A GPS with 2 m accuracy may have impact on such type of study and may need to be justified.

Minor comments:

1. Line 9 of Page 5238: delete the word “and”

2. Line 19-21 of page 5238, the definition of gully erosion may need to be cited

3. The sentence on Line 19-21 of page 5239 “The main effect of gully . . .” may need to be cited

4. Line 13-16 page 5239: what is meant by gully formation results directly from land management practice? How land management practice without interacting with the

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hydrology (rainfall and/or runoff) leads to gully erosion

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