Soil erosion assessment and factors of erosion control in Northeast Wollega, Ethiopia
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GENERAL COMMENTS

The manuscript from Adugna et al. entitled "Soil erosion assessment and control in Northeast Wollega, Ethiopia presents a study that aims to identify erosion spot areas and target locations for development of appropriate measures for soil and water conservation. The authors apply the USLE model to estimate soil loss under different land cover types in NortheastWollega, Ethiopia.

The manuscript is rather confusing and fails to accurately explain the methodology. The authors use indistinctively the terms USLE (Universal Soil Loss Equation) /RUSLE (Revised Universal Soil Loss Equation) and it is not clear which model they are using in this work. Although both models have the same equation, RUSLE has several improvements in determining factors such as new and revised isoerodent maps, a time-varying approach for soil erodibility factor, a subfactor approach for evaluating the cover-management factor, a new equation to reflect slope length and steepness, and new conservation-practice values. It is apparent that they use USLE, since they do not take account deposition on concave slopes, at dense vegetative strips, in terrace channels, and in sediment basins using process-based equations for transport capacity and deposition. However they need to state this clearly in the paper. The paper needs further clarifications on how the model was applied, how they obtained the DEM from the satellite image or conducted the image classification. One of the objectives of the study is to identify hotspot of erosion prone areas. However, the authors don't produce a map with the spatial distribution of the soil loss rates (A) but only provide average values for the four major land uses in your area. Besides the lack of details and flaws in the methodology, the paper needs to be rewritten because it contains many grammar errors and quite often is difficult to read.

SPECIFIC COMMENTS

Abstract:

Is it really RUSLE what you use in this work?

Introduction:

Page 3513, Lines 6-17: These paragraphs need to be rewritten. There is an excessive amount of data in these paragraphs that could be summarised. The detailed description of Ethiopia is redundant since you describe the study area in the methods. Again, you describe thoroughly the RUSLE model ending the section with the statement that the USLE model is the one applied in this work. Please, clarify.

Page 3513, Line 17: In the sentence '...rates of soil erosion in Ethiopia is mainly caused by..., replace 'is' by 'are'.

Page 3514, Lines 24-25: Replace '...control practices best suits to the particular requirements...', by 'control practices that better suit the particular requirements.

Page 3514, Lines 21 and 25: Land cover types or land use types?

Methods:

Please, see my comments above in the 'general comments'.

Page 3515, Lines 1-3: You should refer to your map here (Figure 1). In any case, the location of the study area is unclear from the map. Please, correct this figure.

There are many grammar errors in this section. Please, find below some examples:

Page 3515, Line 4: Replace 'distinguish' by 'distinguished'.

Page 3515, Line 5: Replace 'a diverse' by 'diverse'.

Page 3515, Line 7: What do you mean with 'the condition is humid'? Please, elaborate on this section, including an appropriate climate classification of the area and the sources and analyses used for the climate data.

Page 3515, Line 11: Please be more specific with 'Meher' (the main cropping season).

Page 3515, Line 11: Remove 'mode'. It is redundant here.

Page 3515, Lines 21-22. Use numbering or letters for the selection of your area (a,b or i, ii).

Fieldwork: could you please be more specific with your randomization technique?

Page 3516, Line 10: 'atotal' should be 'a total'.

Page 3516, Line 11: 'Perhaps'? What do you mean? Are you confident with selecting June and September for conducting the fieldwork?

Page 3516, Line 18:'Triumph'? What do you mean? Please clarify.

Page 3516, Lines 25-27: How did you generate a DEM from a 2D image? Please, explain.

Page 3517, Lines 1-3: You indicate that land cover was classified based on percentage of canopy cover. It seems like a very coarse classification. Did you perform image interpretation using other type of indexes?

Page 3517, Line 6: Here again, you indicate USLE instead of RUSLE.

Page 3517, Line 16: The R factor has arguably the most critical effect on soil erosion. However, you use only one meteorological station (in an area of approx. 15,000 ha). Is there any other station in the area?

Page 3518, Line 5: Please specify how you determine 'K' and note that across the manuscript you use 'erodibilityfactor'. Please correct this to 'erodibility factor'.

Refer to table 1 in this subsection.

Page 3519, Line 9: Please be consistent with the use of quotations when referring to the USLE/RUSLE factors, e.g. 'C' or C.

Page 3519, Line 13-. So here you explain how you produced the land cover map. First of all, it is quite an old image (Landsat ETM+ from 2005). In the last 10 years there might have been changes in the land coverage (fires, land abandonment, reforestation, changes in crops, etc.), and I think that is a major drawback in this study. Please, clarify the method used for image analyses: supervised digital image classification or on screen digitalization using Arc-GIS software as stated in Page 3516 Lines 23-24?

Page 3520, Lines 13-24: In my opinion these determinants are not sufficient for assessment of soil erosion control. Please, clarify why you used regression models here.

Results and discussion:

One of your objectives was to identify hotspot f erosion prone areas. However, you don't produce a map with the spatial distribution of the soil loss rates (A) but only provide average values for the four major land uses in your area. Also, there are major statements in this section that can't be proved with your results such as:

Page 3521, Line 18: '...the result of this study clearly shows that nearly the whole study area needs execution of different types of soil and water conservation measures for a sustainable land use'.

Page 3521, Line 25-27: '..the result of this study implies that soil erosion is the most urgent agricultural problems, which present a major jeopardy to land productivity in the study area.'

Conclusions:

Recommendations are very general and not based on the results of the study.

Page 3526, Line 2: in 'very highly severe', remove 'very'; it is redundant.

Tables and figures:

The number of tables could be reduced (i,e, merging Table 1 and Table 4).

References:

Revise your references. Some of the citations in the text are not in the reference list, i.e. Hurni, 1985a, etc. Others are incorrect (e.g. Hueso-Gonzalez et al.: the year of this publication is 2014 and not 2012)