

Interactive comment on “Effects of soil depth on the dynamics of selected soil properties among the highlands resources of Northeast Wollega, Ethiopia: are these sign of degradation?” by A. Adugna and A. Abegaz

Anonymous Referee #2

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Dear author,

The paper is good. Your work aimed to study the spatial and vertical analysis of some soil properties under four land uses (forest, grazing, cultivated and bush lands). I just have some minor technical corrections.

General remarks: You should adjust a little bit the title of your paper to be more suitable toward the majority of the work that you did. Your work focused on studying soil properties at two different depths 0–15 cm (topsoil) and 15–30 cm (subsoil) under different land uses, that is logic for three land uses (forest, grazing, and bush) but for the cultivated land use, it require more depths but you can only refer to that in a single phrase in the part of soil sampling (after line 20 in page 2015).

Specific comments:

Abstract part: In the Abstract part you should not use abbreviations without telling the reader what it is mean, and once you tell the reader what dose is mean you can use the abbreviations in the same part; as viz. (line2 and what is dose mean), OM (line7), TN and AP (line 8) CEC (line 10), it should be Organic matter (OM), Total nitrogen (TN), Available phosphorous (AP) and Cation Exchange Capacity (CEC). You should do the same in the part of conclusion by using the complete terminology without any abbreviations, the abstract and conclusion parts it should be very clear and easy for the reader. In other hand, in the body of the paper you can use only the abbreviations except on the subtitles.

Line 15 (page 2012) in abstract In general, the spatial variability of soil properties indicates that they were strongly affected by external factors (agricultural treatments and soil management practices) and internal factors (soil type and depth). The external factors are just in the case of cultivated land use? For the rest of land uses, the internal factors play the major role in soil variability and hence, there is no role for agriculture management?

1-Introduction part:

Lines 7 -9 (page 2013) Sheet erosion and intensive leaching process leads to higher concentration of clay content and lesser concentration of calcium, magnesium, potassium and sodium in the subsoil than the topsoil. This phrase it isn't clear, I searched on the source (Adeboye et al., 2011) and he didn't speak anywhere about sheet erosion, so please rephrase it to be more logic and understandable.

Line 27 (page 2013) 1.5% it could be 15%?

2- Materials and methods:

Figure 1 it should be modify: a- Put the scale map of the big area as you did in the study area, b- Drag over the big area with its small scale to be in the left side and your study area with its large scale in the right side. c- In the big area some locations you wrote with UPPERCASE, so you should Capitalize each location as you did in Afar and Somali Region. Also the gray areas put it in hollow, and leave only the studied area filled with dark color. d- In the legend you should delete the underscore to be Study area kebeles. e- Delete the title of map of study area; you already referred to it the legend and the figure title.

2.3 Soil analysis

Line 3 (page 2016). Total nitrogen use only the abbreviation TN and please do it in all the lines (except the abstract and conclusion) for the other soil parameters that you told us before what does it mean.

3.1.1 Particle size distributions

You should refer anywhere that the data that you presented in table 2 illustrates the mean values of 40 composite soil samples for each land use, and also you did a correction to the values of soil texture contents (sand, silt and clay) to be equal 100%. Line 1 (page 2018) The percentage changes in sand particle size distribution of subsoil from topsoil were decreasing in all land uses, so is it the same behavior of clay???

3.1.3 Total nitrogen (TN)

Line 8 (page 2019) as a result of losses in organic matter by mineralization in the subsoil, not clear? Maybe it's sufficient to say that, as a result of the high content of organic matter and mineralization in the topsoil in comparison with the subsoil.

4 Conclusions

Line 24 (page 2026) Na⁺ is not available in the soils of sampled depth among the land-use types. Not clear in addition you did not present any information about sodium or salinity in the result and discussion.

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Line 3-4 (page 2027) These processes produce soil horizons giving rise to different soil types. Although that you wrote in this paragraph is true, but in your work you studied soil layers not horizons, so please adapt it to serve your work

Line 14-19 (2027) You should refer in this paragraph to the cultivated land use, like under the cultivation land use this study recommends.

In figure 2. Ca²⁺ and Mg²⁺, the charges it could be in superscript positions, the value -2.97 of clay under BL put it -3. The value of pH -3.3 under FL put it -3.

In Figure 3. The caps letter A,B,C,D,E,F, it should be in small letters as you referred in the text and of figure title . Also you should do unification for the number writing (0.00), I mean tenth and hundredth. The R values in subfigure b it should be in the center of Y axis.

Finally I hope this comments are useful for you and Congratulations for this contribution to Solid Earth (SE).

Sincerely,

Sameh Kotb

Interactive comment on Solid Earth Discuss., 7, 2011, 2015.

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