

## ***Interactive comment on “Estimating soil erosion risk and evaluating erosion control measures for soil conservation planning at Koga Watershed, Ethiopian Highlands” by Tegegne Molla and Biniam Sisheber***

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Authors' Response to the Referee #1 Comments Title of Paper: Estimating soil erosion risk and evaluating erosion control measures for soil conservation planning at Koga Watershed, Ethiopian Highlands Authors: Tegegne Molla and Biniam Sisheber We thank referee #1 for the comments and time spent to review this manuscript. The responses and explanations related to the comments are listed below:

Comment 1 (Paragraph 1): The paper examines soil erosion in the high lands and Ethiopia and evaluates the measures implemented to diminish it. The topic is interest-

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ing and very well presented in the Introduction. However, as I kept reviewing the paper I found that a major restructure needs to be done before being publishable in Solid Earth. I only check it until p. 8 since the number and magnitude of the changes to be done is so significant that it was time wasting to continue. Response: Thank you for your thorough review and salient observations. Since you didn't read the whole document, the comments lack convincing argument that leads to make significant changes. Besides, the nature of the research requires us to clearly discuss and present the RUSLE factors followed by integrated analysis of erosion and conservation which is presented from 3.6 to 3.9. Therefore, it is our sincere hope that this reply provides the necessary corrections and believed that the revised version can meet the journal publication requirements.

Comment 2: The main problem is related to the structure of the paper. The Results and Discussion section present mostly the way the data was obtained, but neither PRESENT nor DISCUSS the data. Example: 3.3 you explain all the process to calculate it but then just 2 lines to discuss the results with no discussion. This section includes several parts (namely the beginning of subsections) which explain the methodology used in this paper. All referred to the methods implemented in this research should be moved to the Methodological section. Response: Regarding the structure of the paper, there can be different approach. The methodology is a general framework of the study. However, the determination of RUSLE factors needs careful investigation and the formulas and values are different from other geographic areas. The factors explained boldly considering the agro climatic condition and data availability in the study area. That is why we presented the factors separately. Some discussions may be short, we did this to make this manuscript short, which is conceptually exploratory and we believe figures and maps are explanatory.

Comment 3: Then, the Results and Discussion should include the DESCRIPTION of the obtained results. What do your data show? What are the geographical patterns shown by your data? Present the values and infer patterns. After, you need to DIS-

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CUSS the factors explaining these data. What are the driving factors controlling soil erosion? You must refer to other studies that have dealt with similar topics. Are results similar/different) are the processes controlling soil erosion comparable and to what extent? Please, refer here to the existing literature on these topics. Response: Under the Results and Discussion section Although it is very brief, we tried to show the result of our data and driving forces of erosion on 3.6 and 3.7. The maps clearly illustrates geographic pattern of soil erosion. In analyzing the driving forces we have reviewed different studies, for instance: “R- Factor (p. 5) is determined from long term data and cross validated from 14 years Soil Conservation Research Project experiments (SCRIP is established by Centre for Development and Environment, Bern in Ethiopia). The result is reliable to use as input for RUSLE. “K- Factor (p. 5 & 6) is determined using recent studies conducted in Ethiopia (SCRIP, 2002; Erdogan et al., 2007; Kaltenrieder, 2007; Andersson, 2010) and the authors discussed it shortly. “On subsection 3.3 (LS- Factor), we have added short discussions related to soil erosion as per the referee’s suggestion. In general, the annual soil loss rate of Koga watershed is compared with other studies conducted within the same AEZ (subsection 3.6).

Comment 4: Comments on specific sections p. 1, l. 13 “clean water and air” p. 1, l. 20 also geomorphic processes are affected p. 1, l. 22 “vegetation” p. 2, l. 9 “has been provoked” p. 2, l. 17 I don’t understand this sentence, may be “Whereas” at the beginning is not appropriate p. 2, l. 27 space needed after elevation “m”. Here and along the text. Usually the first time an altitude is mentioned you should add “above sea level” here you only mention it in the next sentence. p. 2, l. 31 rewrite this sentence, please. Maybe: : “The lowland part of the watershed presents gentle slopes at elevations of 1880 m” p. 3, l. 3 high annual precipitations? Please give values p. 3, l. 12-17 This is methodology and should be moved there p. 4, l. 1-7 Idem p. 7, l. 2-20 Idem p. 8, l. 1-4 Idem Figure 2. The text is too small, not readable Response: Thanks for the suggestion. We have corrected all minor suggestions raised. Such as the spacing between 1880 and m followed by “above mean sea level” are corrected. On page 3 of line 3, annual rainfall is added. The interpolated values of

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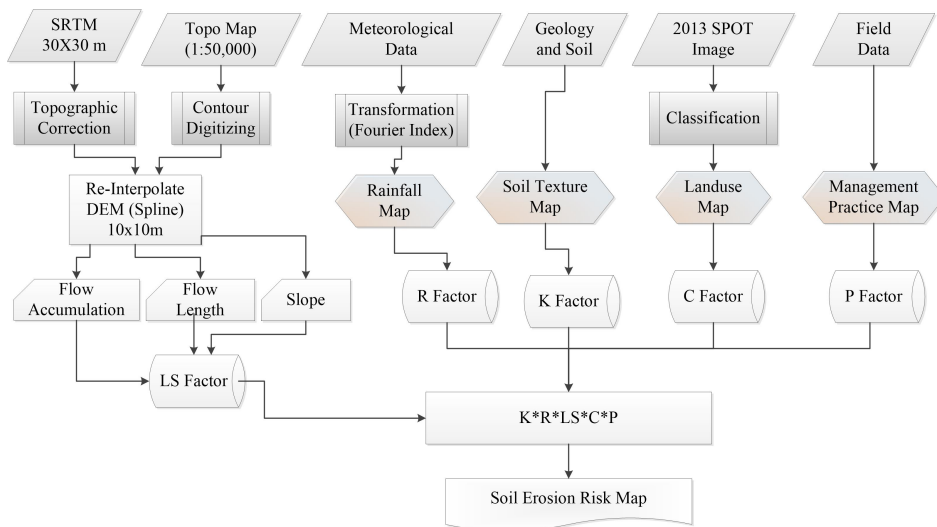
rainfall is also presented on Figure 3. “p. 3, l. 12-17. This is methodology and should be moved there” is suggested. But it is there under Research Methods. The text on Figure 2 modified and can be viewed by zooming the document. Finally, we assure you we conducted detail investigation of the problem and found very useful result that can support land use planners and farmers in the study area. Nonetheless, many of your thoughtful comments and suggestions are considered by the authors and will help us to improve the manuscript further.

Please also note the supplement to this comment:

<http://www.solid-earth-discuss.net/se-2016-120/se-2016-120-AC1-supplement.zip>

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Interactive comment on Solid Earth Discuss., doi:10.5194/se-2016-120, 2016.



**Fig. 1.** Figure 2. The conceptual framework of the research methodology