

## ***Interactive comment on “Geomorphic Threshold Estimation for Gully Erosion in the Lateritic Soil of Birbhum, West Bengal, India” by Sandipan Ghosh and Sanat Kumar Guchhait***

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Received and published: 4 November 2016

Comment 1: Although the manuscript exhibit a high level of scholarship and original research that contributes to the field (especially the measured data needed in models), authors will need to undertake substantial grammatical revision and proof-reading. The authors in consultation with a qualified editor will need to undertake necessary grammatical revision.

Reply 1: We are very much pleased that our research work is getting importance in the publication forum of EGU – SOIL. It is nice to observe that the referee found interest in this manuscript and he appreciated our scholarly work. The referee recommended us to revise the manuscript including grammatical checks. We have now tried to re-

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revise the manuscript again to undertake necessary corrections. Comment 2: Secondly, the manuscript provides context by stating that threshold conditions of gully initiation has not been performed in India. However, besides having a different location, the manuscript needs to provide more context with regards to other international studies, by stating (specifically) what about this study (methodology and/or results) are different or similar or applicable to other studies in other countries.

Reply 2: If we search in the website, surely we can't find any kind of research regarding the measurement of the threshold conditions of gully initiation in Indian terrain. Though, soil loss and land degradation due to gully erosion is an emerging environmental issue in this agricultural dependent country. Now we have included a section in the Introduction about the methodology and results of other erosion researches in comparison to India. Though, the methodology section has a major part of the manuscript. Comment 3: Some parts of the Results and Discussion, especially the sub-headings 3.5 and 3.6 should be rephrased to read as results and discussion (not read as methodology as is the case currently).

Reply 3: The sections of 3.5 and 3.6 are under Results and Discussion. The 3.5 section is concentrated on the estimation of overland flow on the slopes and the 3.6 section discusses the result of the RMMF model derived erosion rate on the slopes. In this section it is necessary and logical to include the model derived equations which are applied to calculate the overland flow and annual erosion rate. For that reason we have included a small section of quantitative expressions. The other parts include only results and trends.

Comment 4: The soil erosion work cited by the authors is impressive, which includes both new and older classic references. The authors correctly indicate that there are a wide range of threshold conditions or values (thresholds of hydraulic, rainfall, topography, lithology and land use – land cover control etc.) which are responsible for the initiation of gullies in different environments. Three other studies that did pioneering work in this regard include:

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Kirkby MJ, Bull LJ, Poesen J, Nachtergaele J, Vandekerckhove L. 2003. Observed and modelled distributions of channel and gully heads – with examples from SE Spain and Belgium. *Catena* 50 (2-4): 415-434. Desmet PJJ, Poesen J, Govers G, Vandaele K. 1999. Importance of slope gradient and contributing area for optimal prediction of the initiation and trajectory of ephemeral gullies. *Catena* 37: 377–392. Kheir RB, Wilson J, Deng Y. 2007. Use of terrain variables for mapping gully erosion susceptibility in Lebanon. *Earth Surface Processes & Landforms* 32: 1770–1782.

Reply 4: The referee admired that we reviewed and cited good referenced works of past and present. The referee suggested to include three another important referenced works in the manuscript. Therefore, we have included these. Comment 5: With so many citations the manuscript is probably exceeding the prescribed length of the journal. The first 3 paragraphs in Introduction (explains erosion as environmental problem) can be shortened.

Reply 5: We have shortened the first 3 paragraphs in the section of Introduction. Alongside we have tried to delete few less significant references.

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Interactive comment on SOIL Discuss., doi:10.5194/soil-2016-48, 2016.

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