

## ***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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Comment 1: The Introduction is very long. It contains information about the intensity of soil erosion processes around the world (South Asia, Europe, USA) as well as causes, intensity and results of soil erosion in relief transformation and agriculture in India. This section presents mainly quantitative data collected from numerous publications (ca 240) cited in the text. The title of the paper is “Geomorphic Threshold Estimation for Gully Erosion in the Lateritic Soil of Birbhum, West Bengal, India” but the discussion of threshold values covers an insignificant part of the text (p. 4, lines: 24-39; p. 5, lines: 9-18.) In my opinion Introduction should be shortened but the fragment about threshold values should be more detailed. I would like the authors to explain how they understand

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the terminology they use in the text: geomorphic threshold, threshold value, threshold condition, critical threshold conditions, geomorphic threshold estimation, threshold relation, threshold phenomenon, critical hydro-geomorphic situation, threshold limit, threshold line in view of study of gully development of Birbhum, West Bengal, India.

Reply 1: As suggested by the referee we have tried to shorten the section of Introduction. It is suggested to give more statements about threshold in introduction. So, we have now tried to give more focus on the different dimensions of geomorphic threshold. We don't prescribe terminology related to only threshold which is a very dynamic concept in respect to physical geography. In this work we have only geomorphic dimension where threshold is placed in the dynamic – process geomorphology. So, the terminology of geomorphic threshold, threshold value, threshold condition etc. is not depicted to present diverse explanation or situation. We have used the term 'threshold' to define a critical condition scale (or value) from where a new equilibrium has occurred in the geomorphic system (i.e. erosion system). So to explain the facts of different results we have used the terminology of threshold as per requirement. For example, based on slope and drainage area the threshold line of erosion system denotes here the perfect non-linear regression line (with high coefficient of determination) above which the initiation of gully starts in the laterite terrain. Comment 2: The authors admit that in determining thresholds of gully development in India they make use of methods devised by other researchers and implemented earlier in other regions of the world. I would suggest supplementing the text with the discussion of the results obtained by other authors. Are they much different and if so why. In figure captions one should quote not only the area to which a given line applies but provide the name of the author and year of publication (fig.4).

Reply 2: We have tried to include the results of other research works in comparison to our work. We have now written the author citations in figure 4. Comment 3: In section 3.5 there is no information about the length of the measurement period of precipitation on the basis of which the overland flow was calculated.

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Reply 3: We have used rainfall data of 2015 (i.e. mean of 1990 to 2015) which was provided by Irrigation and Waterways Department, Government of West Bengal, India. Based on this data we have calculated the overland flow. Comment 4: Suggestions about the figures: In my opinion the information included in figures 4, 6, and 9 was not fully interpreted especially with reference to the results obtained by other authors. Figure 8: The description of axis should be done with the fonts used for other figures.

Reply 4: We have now revised the interpretation of figure 4, 6 and 9 in the text. The description of axis is included the figure 8. Comment 5: Suggestions about the "Reference cited": The items in the reference list are not all compiled in the same style (p. 12, lines:13-15,17, 19, 21,24-25, 26, 29, 30, 34, 35; p.13, lines: 2-3, 7, 10, 13-15, 16, 19, 21, 22, 28, 29,32, 35, 37-38; p.14, lines: 2, 3-4, 6, 9, 12, 14, 15, 17, 20, 23, 24-25, 27, 30, 34, 35, 37; p. 15, lines: 3-4, 6, 8, 12-13, 15, 18, 21-22, 23-24, 25, 31, 33, 36; p. 16, lines:3-4, 6, 10, 13, 16-18, 20, 22, 25, 32, 33, 36; p.17, lines: 1-2, 4, 6-7, 9, 11, 13, 14, 16-17, 19-20, 23, 26, 28, 30, 35, 37; p. 19, lines: 1, 4, 6, 9, 10-11,13, 16, 22-23, 26, 28, 29, 31, 33, 35; p. 19, lines: 1, 4, 7. It refers mainly to different styles used, spaces and dots.

Reply 5: The problematic reference citations are now corrected in the text as same style.

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