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Interactive comment on "Identification of vulnerable areas to soil erosion risk in India using GIS methods" *by* H. Biswas et al.

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Anonymous Referee #2 COMMENT: I appreciate that work that attempts to provide information for policy maker have been targeted to open access journal. It reacts on new administration reform and provide synthetic, spatially distributed data for the new state for the first time.

RESPONSE: Thank you very much, Sir for your kind appreciation of our work. Your words have encouraged us greatly

COMMENT 1: Introduction: 1.1 p.1612, rows 25-26 until p. 1613, r. 5, are concerning global trends, not India or study area, contain redundant info. The information about state of the art in India and study area would be more suitable. 1.2 p.1613, r. 8-19,

hard to comprehend

RESPONSE/CHANGES: Redundant information has been removed and information in r. 8-19, p. 1613 has been simplified for better understanding. Thank you once again.

COMMENT 2: Study area: 2.1 p. 1615 authors name the agro-eco regions, without providing further explanation what this division means, and moreover this regions are not reflected in the study, e.g., according to SER. Authors introduced abbreviations that are not used throughout the study. Authors analyze results according to districts, but here is no information about differences in physiogeographic, land use characteristics, etc. that are later named. Decrease understanding of the results.

RESPONSE/CHANGES: The detailed explanation of agro-eco regions have been provided in Gajbhiye and Mandal (2005). The divisions/sub-divisions in the classification pertain to the entire state. However, a brief account of the agro ecological divisions and subdivisions have been added in the study area section for better understanding. It is true that we have analysed the results according to districts. Information on physiography is of supplementary nature and has been provided for visualization of the reader. Similarity in broad physiographic characteristics across districts, and non-availability of the exact distribution of geological landforms have limited our scope for comparison of districts on these grounds.

COMMENT 3: 2.2 Methods 2.2.1: I recommend to try to simplify, divide the text (in order to increase readability), clearly describe the source for each methodical steps (own vs. previously published methodology), and if possible provide parameters and values used for the different equations, explain the choice of weights and scores more clearly.

RESPONSE/CHANGES: This section was written according to the suggestions of the editor. However, we have tried to simplify the section further as per your comments.

2.2.2: p.1619: r.7-9, is the 12% of the study area (1.38 M ha) with the highest soil

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erosion >40 Mg/ha/y so negligible, that much lower average values (30 Mg/ha/y) could be used? Does this approach not omit very important erosion hot-spots, needed to evaluate and tackle by managers?

RESPONSE/CHANGES: In the present study, the soil erosion risk areas were identified based on the difference between potential soil erosion and soil loss tolerance limits; where the maximum limit of SLTL is 12.5 Mg ha-1 y-1. Therefore, higher soil erosion rates of 30 or 40 Mg ha-1 y-1 convey the same meaning for prioritization of districts from conservation point of view, i.e. both are considered to be equally risky in terms of erosion. Hence, they were clubbed together. We were interested to identify the hot spots based on priority setting. As per our methodology (weighted soil erosion risk) there are three priority classes and priority class I applies to the most sensitive areas.

COMMENT 4: Results: Authors analyze results according to districts, but here is no information about differences in physiogeographic, land use characteristics, etc. that are later named. Decrease understanding of the results. More explicative (maybe a map?/table) comparison for whole state and maybe for each district (physiogeographic characteristics and SER) would be beneficial for managers and readers.

RESPONSE/CHANGES: In the Materials and Methods section it has been stated that both the soil loss tolerance limits (SLTL) map and the Soil Erosion Risk (SER) map have been prepared on a 10 km X 10 km grid, and the parameters computed on each grid point (erosion, tolerance and risk) were extrapolated to the neighbouring areas on a GIS platform to obtain a mapping unit. The mapping units were overlaid on the district map to generate the SLTL or SER maps, and the area under each mapping unit was computed by the GIS software. Almost the whole of Telangana is situated on the northern part of a single physiographic unit, namely the Deccan Plateau, hence it is difficult to compare the districts purely on physiographic basis. Therefore, to explain the SER values obtained, we have preferred to compare the districts based on the differences in area under crops or cropping intensity, soil depth, whether majority of the district has a hilly or flat terrain, rainfall received, etc.

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COMMENT 5. Conclusion: There is no discussion about precision of the results, according to used methods and source data information.

RESPONSE/CHANGES: The study, as also the generation of SLTL and SER maps, was based on the soil erosion map of Telangana on 10 km X 10 km grids, which is the only source of information available in India at present. Work on a finer resolution has already been initiated, but may take some time before it is published. Therefore, this is the best precision that we could achieve. Further, the state of Telangana was formed only recently, therefore we have used only the information which is readily available or which can be inferred from reliable data.

Tables: 1 – difficult to read, improve graphic design, add cross-over points 2. source

RESPONSE/CHANGES: Your suggestions have been incorporated. Thank you.

3. consider usage km2 instead ha, and simplify the long numbers (in tables, figures and text) by using “106” instead M, or 1000 000 ha

RESPONSE: The necessary changes have been made.

Figures: Fig.1 not readable, increase the font of the map labels, increase the size of the map itself, include description (district, states) and name in the map

RESPONSE/CHANGES: It has been done.

Fig 2 increase the size of the map, unit the legend, source of data; the labels for surrounding states are redundant -is not clear which part of Telangana border correspond to which neighboring state

RESPONSE/CHANGES: The suggested corrections have been incorporated. The source of data, as mentioned in the Materials and Methods section is the soil map and the data sets prepared by the National Bureau of Soil Survey and Land Use Planning, Regional Centre, Bangalore, Karnataka (India). All the other maps have been derived by following the protocols developed by Indian Institute of Soil and Water Conservation,

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Dehradun, Uttarakhand (India).

Fig 3, Fig. 5: use km2 instead of ha, is hardly readable; increase the size of the map, unit the legend, source of data; the labels for surrounding states are redundant -is not clear which part of Telangana border correspond to which neighboring state

RESPONSE/CHANGES: It has been incorporated. Explanation regarding the source of data has been given above.

Fig 4 explain what 'T' means in the description

RESPONSE/CHANGES: It has been explained. Thank you.

Interactive comment on Solid Earth Discuss., 7, 1611, 2015.