Reviewer#2

We sincerely thank reviewer 1 for their valuable comments on this manuscript. We have tried our best to incorporate all suggestions. Detailed answers to the specific questions are given in the following paragraphs.

Comment 1: Page 6: Line 20-24: How the spatial variability of rainfall is taken into account. Since the measured rainfall data is from stations, which interpolation method was adopted to spatially distribution the rainfall data for each grid.

Response: We have used gridded rainfall dataset developed by India Meteorological Department (Rajeevan and Bhate, 2009). The dataset is available at 0.25 degree resolution and is obtained by interpolating more than 4,000 measured rainfall stations data using Shepard's interpolation method (Shepard, 1968).

Comment 2: Section 3.4: Step by Step procedure: is not a methodological step. Probably the sentence can just continue without the section.

Response: As suggested, we have removed this section heading in the revised version of the manuscript.

Comment 3: 4.1.1: Figure 4(a) suggest the highest rainfall value as 666 mm whereas in the text it indicates 1000 m. please check.

Response: Figure 4(a) is the rainfall erosivity map which is estimated by using average annual rainfall values. The values are reported in MJ mm/ha hr y units. In the text (page 10, line 25), we have reported that in upper mountainous region of the study area the average annual rainfall exceeds 1000 mm. To avoid any confusion, we have now prominently shown the units of R factor in Figure 4(a).

Comment 4: Section 5: The description indicates that uncertainty arising from input sources. In this study, such as R, LS, K and CP are not quantified. Out of 6 variables in SE equation, four are not considered. Similarly, the text indicates that model uncertainties are considered (and immediately suggest structural uncertainty could not be quantified). In my opinion, model uncertainty is structural uncertainty (they are the same thing). So, it appears that the paper is unable to take into account many variables of uncertainty assessment. In such circumstances, I don't see a good justification for the title of the paper which highlights uncertainty estimations.

Response: We have quantified uncertainty for all six factor of RUSLE. These uncertainties can stem from data (measurement errors, coarse spatial and temporal resolution, missing values), model (parameter uncertainty, structural uncertainty, algorithmic or numerical uncertainty), and stochastic nature of the soil erosion process. Structural uncertainty is part of model uncertainty (Beven and Brazier, 2011). However, in this study, we have used easily available uncertainty for different factors (Page 2, Line 9 – 11; Page 13, Line 4 – 7).

Comment 5: The second paragraph of section 5 Limitation is explaining very generic limitation of data and linked to uncertainty. This needs revision and I suggest not to highlight this kind of uncertainty which is there any way (such as DEM and RUSLE equations).

Response: Agreed. We have removed the concerned lines from section 5 in the revised manuscript.

Comment 6: In concluding remarks: various points describing findings be avoided and major conclusions can be highlighted.

Response: We have renamed section 6 as 'Summary and Concluding Remarks' and have highlighted the major conclusions from this study.

Comment 7: Abstract: page 1, Line 22: "Furthermore, the topographic steepness (LS) and crop practice (CP) factors exhibit higher uncertainties than other RUSLE factors." However, In the main text, R, LS, K and CP are not quantified for uncertainty analysis. Please check the consistency.

Response: Uncertainty assessment has been done for all six factors of RUSLE equation (Please see response to comment 4). Thereafter, uncertainty comparisons suggest that LS and CP factor exhibit higher uncertainty.

Comment 8: Page 2: Line 5-6: the 'uncertainties" is mentioned in two places, latter can be removed. (…… These uncertainties can stem from uncertainties in data).

Response: Done.

Comment 9: Please add some references for sources of uncertainty. For example, in hydrological modelling application, uncertainties are from 1) model input data 2) structural uncertainty 3) parameter uncertainty

Response: We have cited the literature published by Beven and Brazier (2011) and JCGM (2008) on source of uncertainties in the erosion model predictions (Page 2, Line 4). However, research on uncertainties estimation for soil erosion and sediment yield is very few which are mostly covered in the Introduction section (Page 2, Line 20 – Page 3, Line 33).

Comment 10: Page 5: Line 4: sentence not clear "role of uncertainties in input parameters on uncertainties in the estimates"

Response: We have corrected the sentence in the revised manuscript. The modified sentence is "*The Garra River, a Himalayan tributary of River Ganga, was selected for demonstration of the developed methodology and for investigating the role of uncertainties in input parameters and SE and SY estimates*".

Comment 11: Page 5: Line 1 indicated river as ungauged, but Line 24 suggest one gauging station. Please clarify!

Response: The study basin has two gauging stations where sediment yield is measured - (1) Nanak Sagar Dam at upstream and (2) Husepur at downstream. Validation of modelled results are done by using data from these two gauge stations. However, Line 1 indicates that presented methodology can be applied to an ungauged basin.

Comment 12: Page 6, Line 8: SE is estimated by Revised Universal Soil Loss Equation (RUSLE)……The abbreviation should be used the first time when it is mentioned. RUSLE has been mentioned many time in above sections. Same applies to others also.

Response: Agreed and done.

Comment 13: Page 6: 25. It would be useful to define the SDR with proper reference. Example: SDR is defined as the sediment yield from a catchment area divided by gross erosion of the same area.

Answer: We have defined SDR in Page 4 lines 8 – 10 and provided reference for it (Walling, 1983; Richards, 1993; USDA, 1972; De Vente et al., 2007).

Comment 14: Figure 4a: check the legend

Response: Figures 4(a) is a rainfall erosivity map which is derived from average annual rainfall values.

Comment 15: Figure 7 appears before Figure 5 in the text

Response: Corrected.

Comment 16: Page 19: Line 8: inconsistency in references

Response: Checked and corrected.

References:

Beven, K. J., & Brazier, R. E. Dealing with uncertainty in erosion model predictions. Handbook of Erosion Modelling, 52-79, 2011.

De Vente, J., Poesen, J., Arabkhedri, M., & Verstraeten, G. The sediment delivery problem revisited. Progress in Physical Geography, 31(2), 155-178, 2007.

JCGM. Evaluation of measurement data - Guide to the expression of uncertainty in measurement. Working Group 1 of the Joint Committee for Guides in Metrology (JCGM/WG 1), 2008.

Rajeevan, M., & Bhate, J. A high resolution daily gridded rainfall dataset (1971–2005) for mesoscale meteorological studies. Current Science, 96(4), 558-562, 2009.

Richards, K. Sediment delivery and the drainage network. Channel network hydrology, 221-254, 1993.

Shepard, D., A two-dimensional interpolation function for irregularly-spaced data. In *Proceedings of the 1968 23rd ACM national conference* (pp. 517-524). ACM, 1968.

USDA. Sediment sources, yields, and delivery ratios. National Engineering Handbook, Section 3 Sedimentation, 1972.

Walling, D. E. The sediment delivery problem. Journal of hydrology, 65(1), 209-237, 1983.