

Interactive comment on “Distributed specific sediment yield estimations in Japan attributed to extreme-rainfall-induced slope failures under a changing climate” by K. Ono et al.

K. Ono et al.

luminda@kaigan.civil.tohoku.ac.jp

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We are greatly appreciating the reviewer's comments. Answers for your comments were made after careful consideration of each comment and listed below. Manuscript was revised accordingly.

Comment 1 The authors introduce extreme-rainfall with return period of 5 years. Extreme rainfalls are usually those with return period equal or larger than 50 years. The rainfall considered by the authors could be called significant. Otherwise the authors should justify the use of adjective "extreme".

C4008

Answer We agreed with the reviewer's comment about use of larger return period in the context of flood simulations or dam design. In this particular study also, we examined the effect of different return periods (5, 10, 15, 20, 25, and 30 years) on sediment yield and found that 5 year return period has the highest correlation with the observed sediment yields (Figure 1). Nevertheless, extreme precipitation for 5 years return period was obtained by GEV probability analysis. Therefore, it is called as the extreme-rainfall. Particular discussion about the selection of 5 year return period among several others can be found in page 7131, Line 23 to page 7132, Line 15.

Comment 2 The sentence (pag. 7127) "For 1024 AMeDAS meteorological station throught Japan, GEV analysis generates 1024 extreme rainfall values" could be misleading. GEV analysis has been carried out considering the whole data set of the 1024 stations or applied independently to each station? The authors should clear.

Answer When considered one AMeDAS meteorological station, we obtained annual maximum precipitation values over 21 years and employed them in GEV analysis. Therefore, for 1024 meteorological stations, GEV analysis generated 1024 extreme values. We have changed the description in the revised manuscript to avoid the misleading.

Comment 3 Part of this work, i.e. the Probability model for slope failure, is in a more detailed and exhaustive form in the paper of Kawagoe et al. (2010). The authors should link more directly these parts to this previous paper. It seems that these parts are new.

Answer We used the developed probability model for slope failure by Kawagoe et al. (2010) and extended the use of it by developing a regression model for sediment yield. We have briefly explained the methodology to developed probability model for the sake of completeness of our discussions. Adequate references (Page 5, Line 1 and Page 6, Line 3) to Kawagoe et al. (2010) were made for a proper link between our paper and Kawagoe et al. (2010).

Comment 4 Pag, 7125, line 17 substitute "with a" with "by using"

C4009

Answer We made this correction.

Please also note the supplement to this comment:

<http://www.hydrol-earth-syst-sci-discuss.net/7/C4008/2010/hessd-7-C4008-2010-supplement.pdf>

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C4010