

Interactive comment on “Effectiveness and efficiency of slot-check dam system on debris flow control” by Y. H. Zou and X. Q. Chen

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Reply to Reviewer’s Comments

The authors thank the reviewer for the careful examination of the manuscript and concrete suggestions for improvement. The manuscript will be carefully revised according to the comments. Specific responses to the review comments are itemized separately for the reviewer.

The manuscript has been sent to be edited by a specialist so that the grammar errors would be corrected.

Some specific comments and questions:

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(1) On page 5782, line 3, the symbols v_i and V_n in Eq. (1) have been annotated in the revised version.

(2) On page 5782, line 8, the η_{subsi} in Eq. (2) is the ratio of sediment volume of subsystem to that of the whole system. That is used to analyse the function of a dam in the whole.

(3) The concept of “a slot-check dam system” means “a dam group”, and “subsystem” means a upstream part of the dam system.

(4) On page 5783, line 2, “ n is the frequency of the related rainstorm”, “related” should be deleted.

(5) On page 5783, line 5, the symbols A_0 and L_0 in Eq. (6) have been annotated in the revised version.

(6) On page 5784, line 18, “ D_{90} is the 90% particle size of the debris flow”, in which, “90% particle size” means the cumulative mass of the particles which are finer than the diameter D_{90} accounts for ninety percent in the whole mass.

(7) On page 5785, line 11, B_{min} in Eq. (21) is the same as b_{min} in Eq. (16). The symbols have been unified in the revised version.

(8) On page 5786, paragraph 2, the numbers of the figures have been reordered.

(9) On page 5787, paragraph 2, the numbers of the figures in the content have been reordered.

(10) On page 5789, paragraph 2, line 5-6, the series of five slot-check dams are part of the mitigation projects in the whole river basin. The sediments will flow downstream through the drainage channels when the basin suffer more debris flows.

(11) On page 5789, paragraph 4, line 2-4, field survey had been conducted to investigate the performance of the slot-check dams in Shengou Basin. The dams successfully resisted to the impact of the debris flows with the scale within design.

(12)Table 3, the concept of η_{selfi} has been defined in the revised version and the method of calculation has been explained.

(13)Fig. 6, more explanation of the how the results in Fig. 6 were obtained has been given in the revised version.

(14)Fig. 7, more quantitative information including the efficiency model will be added in Fig. 7 to make the design procedure more expatiated and applicable.

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 3, 5777, 2015.

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