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Natural Hazards and Earth System Sciences
Discussions

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

Q. Chen

chenqun@scu.edu.cn

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An evaluation model associate to the controlled catchment characteristics have been proposed to calculate efficiency of a slot-check dam and the system to control debris flow in a river basin. Field survey on a group of slot-check dams at Shengou Basin in Yunnan Province, China have been carried out and sediment volume behind the dams are measured. The conserving efficiency of a slot-check dam system base on measured data is compared with the results from the evaluation model to verify the reliability of the evaluation model. This work is interesting and has practical significance for the design of a slot-check dam to control debris flow.

However, the manuscript should be improved to be published. At first, many grammar

errors should be corrected. Secondly, some symbols used in the equations without annotation should be interpreted. Thirdly, all of the concepts in the manuscript should be definite and coincident and all the symbols in tables that represent same concept in the context should be coincident with those in context. Fourthly, the values of all parameters used in the model should be given. Fifthly, all figures should be cited in context successively. Finally, how the evaluation model can be used in the design of a slot-check dam system should be further stated.

Some specific comments and questions:

(1) The symbols vi and Vn in Eq. (1) should be annotated.

(2) The ηsubsi in Eq. (2) is not a concept of efficiency such as ηsysi in Eq. (3). It is only a ratio of sediment volume of subsystem to that of the whole system.

(3) The concept of "a slot-check dam system", "dam group" and "subsystem" etc. should be exactly defined.

(4) On page 5783, line 2, "n is the frequency of the related rainstorm", what does the "related rainstorm" means? How to determine this parameter?

(5) The symbols A0 and L0 in Eq. (6) should be annotated.

(6) On page 5784, line 4 from the bottom, "D90 is the 90 % particle size of the debris flow", in which, what does "90% particle size" mean?

(7) Is Bmin in Eq. (21) the same as bmin in Eq. (16)? If it is, the same symbol should be used.

(8) On page 5786, paragraph 2, Figure 7 and Fig. 8 should not be cited in the context before Fig. 1 to Fig. 6.

(9) On page 5787, paragraph 2, Fig. 2 should not be cited in the context before Fig. 1.

(10) On page 5789, paragraph 2, line 5-6, why more mitigation projects or methods

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should be added? Does the system efficiency of 20 % reach the limit of the capacity? Will the slot dams be failure when they suffer more debris flow?

(11) On page 5789, paragraph 4, line 2-4, why or how can the authors get this conclusion? Did the slot dams suffer the maximum designed rainfall? If they didn't, the conclusion cannot be obtained.

(12) Why is the efficiency of each dam ηselfi in Table 3 calculated by the ratio of the square of the height, but not by the ratio of the volume defined in context? The concept of ηselfi should be defined in the context.

(13) How the results in Fig. 6 were obtained should be given.

(14) The function of the efficiency model cannot be found in Fig. 7, so how to use the model proposed in this paper to help design should be expatiated in the context.

Please also note the supplement to this comment:
http://www.nat-hazards-earth-syst-sci-discuss.net/3/C2618/2015/nhessd-3-C2618-2015-supplement.pdf

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