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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Experimental assessment of the relationship between rainfall intensity and sinkholes caused by damaged sewer pipes" *by* Tae-Young Kwak et al.

Anonymous Referee #2

Received and published: 6 August 2020

An experimental study about the relationships between rainfall intensity and development of sinkholes caused by damaged sewer pipes in Korea is described in the paper. The topic is certainly of interest to NHESS, and the work contains interesting data and considerations. I have listed in the accompanying file a number of small corrections, and a few requests of clarification on some issues that are not clear to me.

I discourage throughout the manuscript the use of the term "ground cave-ins", since this is not used in the international literature, and may induce confusion and misunderstandings in the readers.

How were the different rainfall intensity chosen? It is briefly said in the initial part of the

paper that this was based upon the rainfall values in South Korea, but then no rainfall data was provided to justify the choice of the adopted values. It would be good to add a few lines, or a figure, to describe the rainfall trend in the area. Further, a brief text explaining the importance of establishing relationships between rainfall and geological hazards could be useful, also referring to other hazards such as landslides (see for instance the works by Peruccacci et al. (2012), Rossi et al. (2012), and Vessia et al. (2012).

When quoting figures throughout the manuscript, please avoid he use of multiple brackets.

In general, the reference list can be improved, especially by adding the main international works about sinkhole classification, which are lacking in the present version of the manuscript. Apart from some references directly suggested in the accompanying file, I am enclosing to this comment a list of possible additional references that might be useful to the Authors to improve their paper.

When quoting more than one paper in the text, the references must be listed in chronological order. This guideline is not followed in the manuscript. Please correct it throughout the text.

Suggested references:

Beck, B.: Soil Piping and Sinkhole Failures. In: Encyclopedia of Caves (Second Edition), White, W. B. and Culver, D. C. (Eds.), Academic Press, Amsterdam, 2012. Closson D, Abou Karaki N (2009) Human-induced geological hazards along the Dead Sea coast. Environ Geol 58:371–380. Gutiérrez, F., Guerrero, J., Lucha, P., 2008. A genetic classification of sinkholes illustrated from evaporite paleokarst exposures in Spain. Environ. Geol. 53, 993–1006. Gutierrez F., Parise M., De Waele J. & Jourde H., 2014, A review on natural and human-induced geohazards and impacts in karst. Earth Science Reviews, vol. 138, p. 61-88, doi: 10.1016/j.earscirev.2014.08.002. Parise M., 2015, A procedure for evaluating the susceptibility to natural and anthropogenic sinkholes.

Georisk, vol. 9 (4), p. 272-285, DOI:10.1080/17499518.2015.1045002. Parise M., 2019, Sinkholes. In: White W.B., Culver D.C. & Pipan T. (Eds.), Encyclopedia of Caves. Academic Press, Elsevier, 3rd edition, ISBN 978-0-12-814124-3, p. 934-942. Parise M., Pisano L. & Vennari C., 2018, Sinkhole clusters after heavy rainstorms. Journal of Cave and Karst Studies, vol. 80 (1), p. 28-38. DOI: 10.4311/2017ES0105. Peruccacci, S., Brunetti, M. T., Luciani, S., Vennari, C., and Guzzetti, F.: Lithological and seasonal control on rainfall thresholds for the possible initiation of landslides in central Italy, Geomorphology, 139–140, 79–90, 2012. Rossi, M., Peruccacci, S., Brunetti, M. T., Marchesini, I., Luciani, S., Ardizzone, F., Balducci, V., Bianchi, C., Cardinali, M., Fiorucci, F., Mondini, A. C., Reichenbach, P., Salvati, P., Santangelo, M., Bartolini, D., Gariano, S. L., Palladino, M., Vessia, G., Viero, A., Antronico, L., Borselli, L., Deganutti, A. M., Iovine, G., Luino, F., Parise, M., Polemio, M., and Guzzetti, F.: SANF: a national warning system for rainfall-induced landslides in Italy, in: Proceedings of the 11th International Conference and 2nd North American symposium on landslides, Banff, Alberta, Canada, 3–8 June, 2012. Vessia G., Parise M., Brunetti M.T., Peruccacci S., Rossi M., Vennari C. & Guzzetti F., 2014, Automated reconstruction of rainfall events responsible for shallow landslides. Natural Hazards and Earth System Sciences, vol. 14, p. 2399-2408. Waltham, T., Bell, F., Culshaw, M., 2005. Sinkholes and Subsidence. Springer, Chichester, (382 pp.). White, W.B., 2002. Karst hydrology: recent developments and open questions. Eng. Geol. 65, 85–105.

For all the considerations above, I recommend minor revision. I believe that, after some corrections, and following the journal guidelines for citations, the manuscript may become acceptable for publication.

Please also note the supplement to this comment:
https://nhess.copernicus.org/preprints/nhess-2020-143/nhess-2020-143-RC2-supplement.pdf

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