

Interactive comment on “Causes and consequences of the Sinkhole at “El Trebol” of Quito, Ecuador - Implications to economic damage and risk assessment” by Theofilos Toulkeridis et al.

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Dear Editor, Dear Authors

The manuscript - Toulkeridis, T. et al: Causes and consequences 1 of the Sinkhole at “El Trebol” of Quito, Ecuador - Implications to economic damage and risk assessments an interesting contribution. The topic is appropriate to consider for publication in Natural Hazard and Earth System Sciences. The article is very interesting and fills an important gap in the literature on geological hazards in the Andean region. However the paper needs minor revisions to be published.

In general:

The causes of the sinking are a combination of hydrological aspects with geo- mechanical or geotechnical, the latter part is much less developed. It will be appreciated some more emphasis on the precise mechanism of formation of the sinkhole. This aspect can be covered with some 2-3 lines in conclusions and a paragraph in results: Analysis of the causes of the sinkhole (as results of observations)

1. Introduction

The problem is well focused, and the authors explain other case studies Beck, 1991; Aisong and Jianhua, 1994; Salvati and Sasowsky, 2002; Williams, 2003; Beck, 2004; Waltham et al., 2005), It can be interesting to show which sinkhole (among those) is similar to “El Trebol” and add a figure to relate them as in . Gutierrez, F., et al (2008)

2. Geology

This chapter refers to the Geological setting and geo-mechanical behavior, the geological part should be enlarged, and geomechanics (even basic aspects) are not explained. This part is significantly smaller than others.

There is no data of soil resistance, lab-testing or empirical determinations that justify geotechnical ground behaviour. But as it is not a strictly geotechnical article this data can be ignored if clear schemes of sinking stages are made. A clear figure of the process is missing.

At the conclusions it should be recommended a geotechnical field work, because no strength nor deformability parameters are available.

Hydrogeology, items 3,4,5

Hydrogeological part is very complete, but it could be reduced somewhat and unifying chapters synthesize 3,4 and 5.

Items 6-7

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This chapters are too long, can be significantly reduced, synthesised. The can be all under a unique title: Analysis of the causes of the sinkhole.

It will be appreciated a figure showing the sinking process or sinkhole formation relating to processes seen in other areas as in ref: Gutierrez, F., Cooper, A. H. and Johnson, K. S., 2008

Conclusions.

A geotechnical and geophysical field survey must be recommended, as there is no data about ground properties, see: Gutiérrez, F., et al, 2009: Gutierrez et al 2008: Kaufmann, G. and Romanov, D., 2009

Figure 7

Should be improved, indicating geological ages, formations, etc. and water table if exists.

I note that I cannot provide a detailed linguistic revision as I am not a native English speaker.

Please also note the supplement to this comment:

<http://www.nat-hazards-earth-syst-sci-discuss.net/nhess-2016-17/nhess-2016-17-RC2-supplement.pdf>

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., doi:10.5194/nhess-2016-17, 2016.

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