

# ***Interactive comment on “Liquefaction, landslide and slope stability analyses of soils: a case study of soils from part of Kwara, Kogi and Anambra states of Nigeria” by Olusegun O. Ige et al.***

## **Anonymous Referee #1**

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### **1. General comments**

The paper treats two phenomena (liquefaction of soils and landslide) that in general produce significant hazard. The idea to study soil samples, using standard geotechnical tests, to determine “...their liquefaction and sliding potential” is good, but the data used are insufficient and the method proposed is not adequately defined. This lack compromises the scientific quality of the paper. In particular, the results discussed, although are included appropriate references, do not allow coherent and robust conclusions with reference to the goals declared from the Authors. With the available data, probably, a more feasible goal can be a preliminary assessment of liquefaction and sliding potential of soils present in three major landslide prone areas in Nigeria. To this

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aims is necessary a thorough reworking of the paper.

## 2. Specific comments

“...A total of nine samples...” can’t represent the “...three major landslide prone areas in Nigeria...” with reference to “...determining their liquefaction and sliding potential”. Probably a more feasible goal can be a preliminary assessment of liquefaction and sliding potential of soils present in three major landslide prone areas in Nigeria. However, also in this case, it is opportune to indicate the main characteristics of the lithologies present in the studied areas and furnish a synthesis of the corresponding landslide conditions. It is not clear (“3.1 Site visit and Data collection”) if the collected samples are undisturbed. In particular, only in the sub-section 3.2.4 is indicated that the direct shear tests were performed on reconstructed samples, and this choice, in general, it is not a good choice with reference to the “...slope stability evaluation”. The geotechnical tests used in the paper, in general, were carried out based on BSI, therefore it is redundant to describe all the tests in details. If is the case the authors can list only non-standard details that have been used. For the permeability tests the authors do not indicate the standard used. The sub-section “3.3 Method of slices using SLOPE/W software” represents a crucial point. The content of this sub-section describes a parametric analysis of slope stability (...that uses the software SLOPE/W as tool). In particular, the elements that concur to the geotechnical schemes of the slopes representative of the studied areas – the slope model analysed using SLOPE/W - must be defined in a more complete and clear form. In particular, in the paper are not exposed the geological, geomorphological, hydrogeological and geotechnical conditions that can be taken as representative in the study areas. In the section 4., the discussed results demonstrate that the geotechnical schemes adopted to carry out the parametric analysis are not representative of the slopes that in the studied areas are interested by landslides. Others specific comments are listed in the annotated file “nhess-2016-297\_annotated.pdf”. The CONCLUSION must be rewritten after a thorough reworking of the paper.

## 3. Technical corrections

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A complete list of technical corrections is directly reported in the annotated file "nhess-2016-297\_annotated.pdf" (text, references, tables and figures).

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Please also note the supplement to this comment:

<http://www.nat-hazards-earth-syst-sci-discuss.net/nhess-2016-297/nhess-2016-297-RC1-supplement.pdf>

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