

Earth Syst. Sci. Data Discuss., author comment AC2
<https://doi.org/10.5194/essd-2020-324-AC2>, 2021
© Author(s) 2021. This work is distributed under
the Creative Commons Attribution 4.0 License.

Reply on RC3

Alessandro Tibaldi et al.

Author comment on "Slope deformation, reservoir variation and meteorological data at the Khoko landslide, Enguri hydroelectric basin (Georgia), during 2016–2019" by Alessandro Tibaldi et al., Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2020-324-AC2>, 2021

Dear Reviewer 3,

thank you for your useful suggestions. We have prepared a new version of the paper where we included all of them. The point-by-point replies to all suggestions are listed below. The Editor advised me that we will be allowed to upload the new version of the manuscript only in a successive stage when we will have received all the reviews.

Reviewer: Data presented are interesting since there was real monitoring. But the analysis and interpretation looks rather poor.

Reply: In the new version we added a new chapter on the inner structure of the landslide where we described more data based on logs, piezometers, geological survey, and numerical modelling. We also expanded the Discussion with the new sections "5.1 Correlation slope deformation - lake level - rainfall" and "5.2 Behaviour of the landslide and slip planes".

Reviewer: have few major comments. First, about the overall shape of the Khoko landslide (a in Figure 3). I'm not sure that the landslide northern boundary is correct. To my knowledge, I would draw the overall landslide more funnel-shape, with its northern boundary on the other, southern side of the "peninsula". It can be of some importance for the interpretation.

Reply: thank you for your suggested interpretation, but our Figure 3a (and the map of Figure 2) are based upon our field surveys, and also on surveys made by Soviet researchers before the lake infilling, that show the presence of scarps, sink holes and fissures in the drawn landslide body, and the drawn landslide boundaries are also based on piezometers broken by movements along the landslide slip planes, as explained in the new data section "2.2 Substrate description". These observations allowed us to precisely draw the boundaries of this complex landslide.

Reviewer: Second, relationships between extension measured in Trench 1 and 2 and lake level shown in Figure 10 have opposite trends. While in trench 1 it followed with some delay first impoundment and, generally ignored further variations, in Trench 2 extension increased during first level drop and somehow during the second drop and following the maximal rain. Authors did not explain it. Authors should provide more fact-based

analysis not affected by some initial hypothesis.

Reply: we now made a more in-depth discussion analyzing the deformation at each extensometer in comparison with lake level variations and rainfall values. We put in evidence the presence of different rock volumes in the landslide that can move independently, as also suggested by the presence of different slip planes (described in the new section "2.2 Substrate description"). This can explain the different behaviors recorded at the two trenches.

Reviewer: Frankly speaking, I'm not sure that there is enough data to provide any well groned conclusions.

Reply: our paper contains four years of observations of lake level, rainfall, extension at two extensometers, and temperature, plus geological and geomorphological data coming from field surveys of the landslide area (added in the new version), plus lithostratigraphic and geotechnical data coming from more than a dozen of logs and piezometers distributed in the landslide body (added in the new version). These data are of paramount importance because this is the first monitored landslide of the Republic of Georgia, and is one nice example of monitoring of an unstable slope facing an artificial water reservoir, connected to a major hydroelectrical plant. Apart from being a useful example, the publication of these data is also necessary to arise concern about the geohazard situation at this strategic facility.