

Characteristics, distribution and susceptibility of natural and human-induced landslides in a tropical mountainous region: the Rift flank west of Lake Kivu (DR Congo)

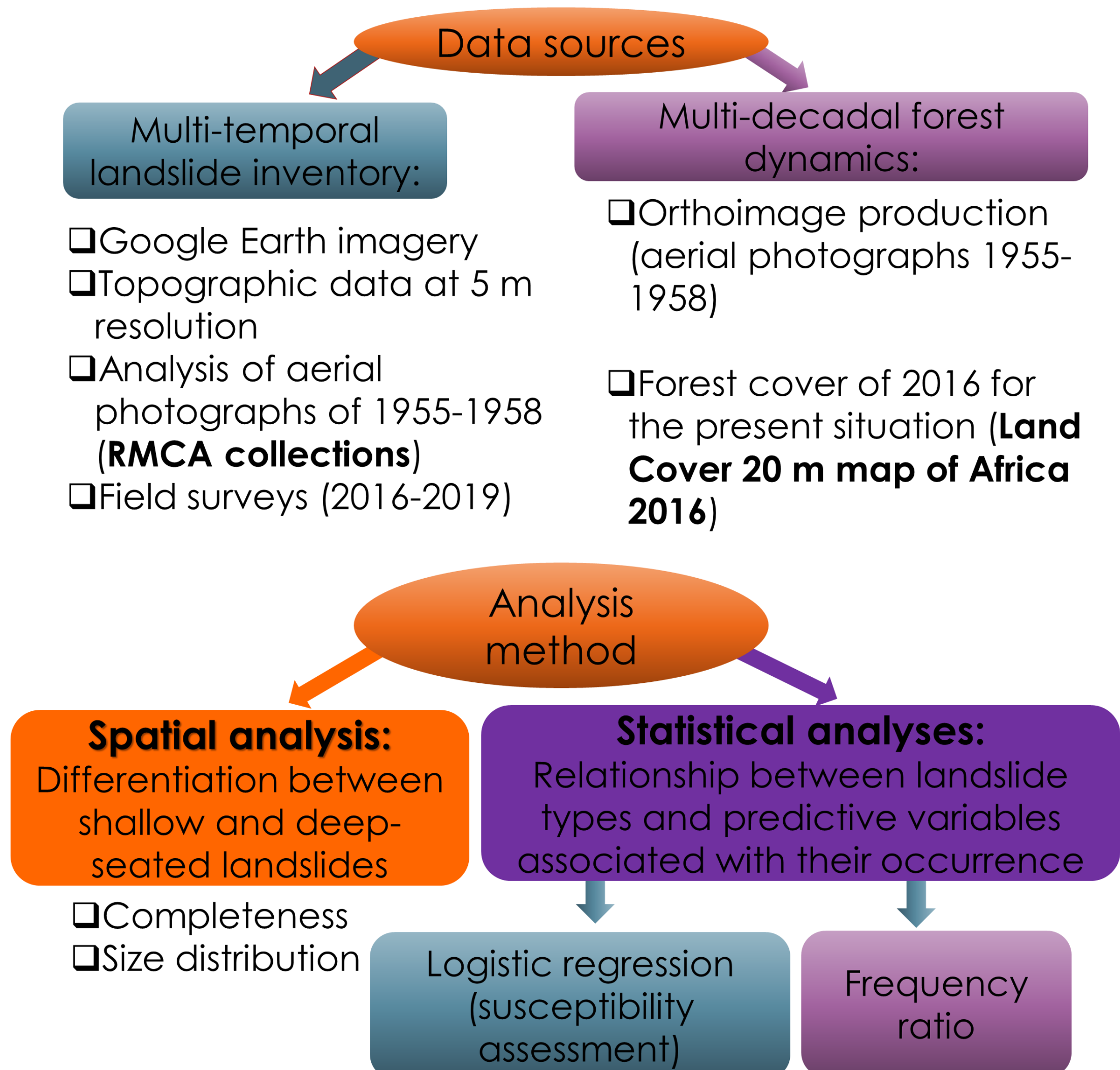
Introduction

Tropical mountainous regions are often identified as landslide hotspots with particularly vulnerable populations. Whereas both natural (e.g., rainfall, lithology) and anthropogenic (e.g., deforestation, mining) factors are expected to be involved in landslide occurrence, the relative importance of such factors remains poorly documented

Objective

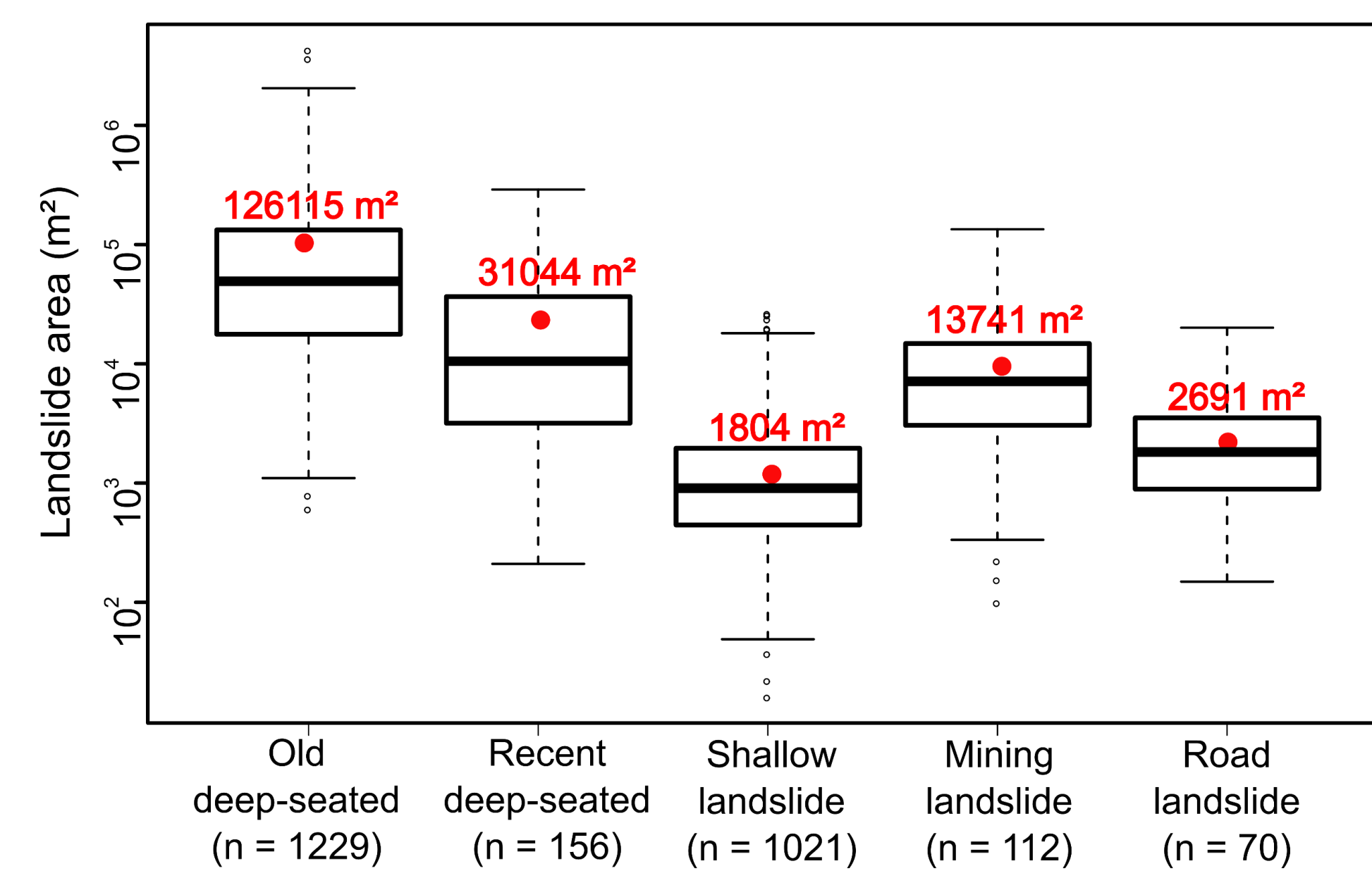
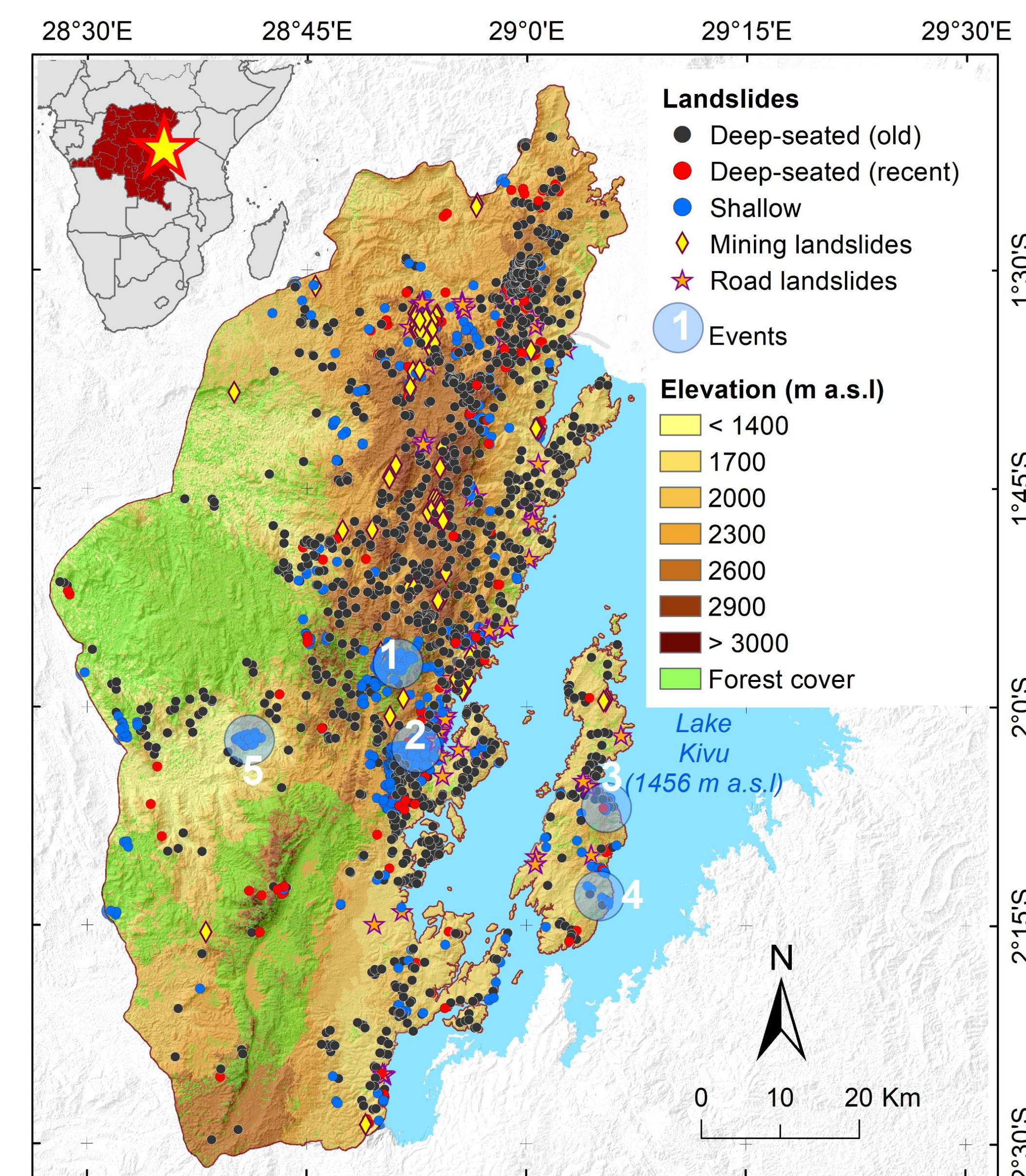
To understand the role played by natural and anthropogenic factors in the occurrence of landslides in the Rift Flank west of Lake Kivu in DR Congo

Materials and methods



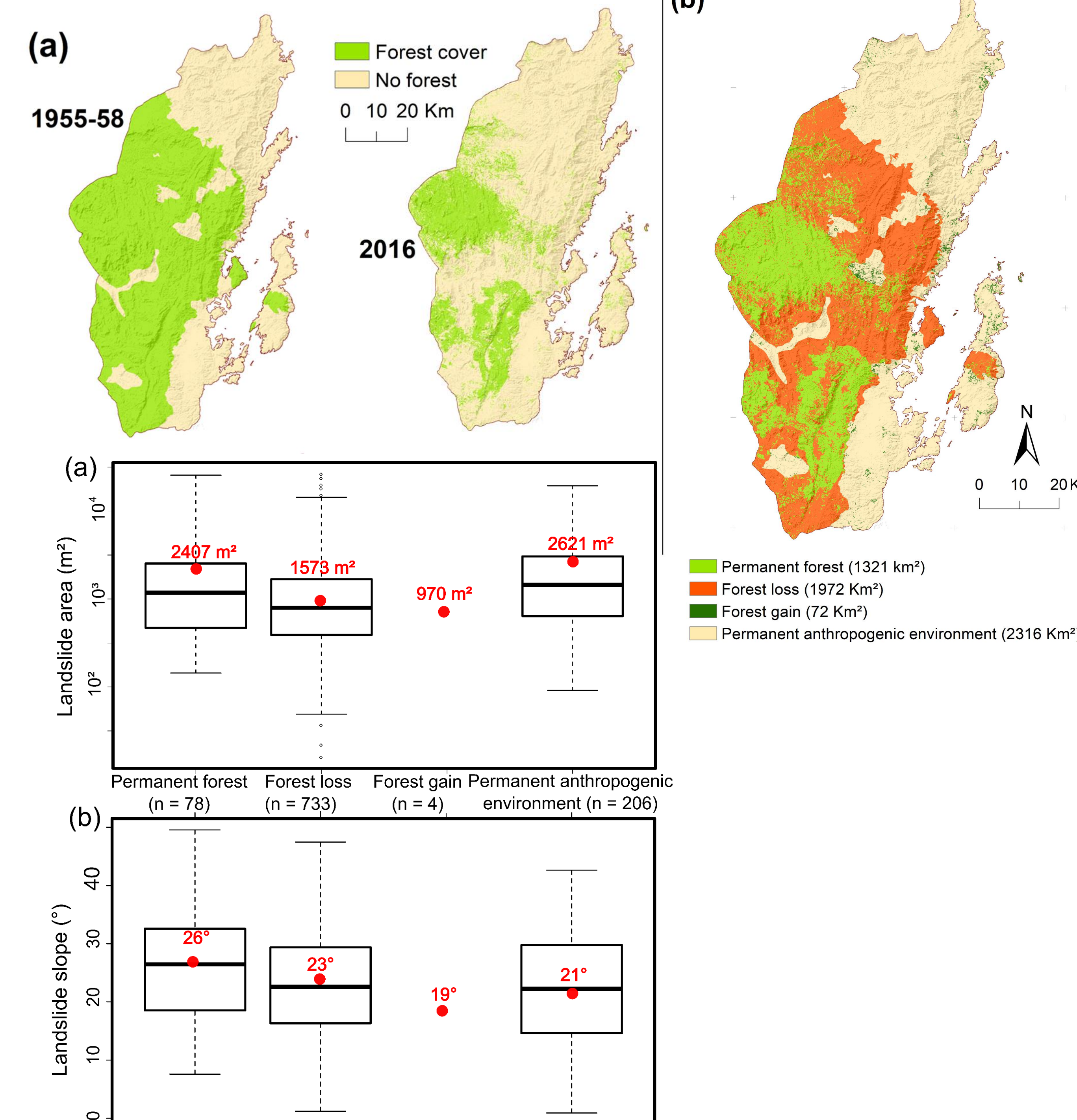
Result and discussion

Landslide inventory



→ Independence in size distribution

Forest cover dynamics

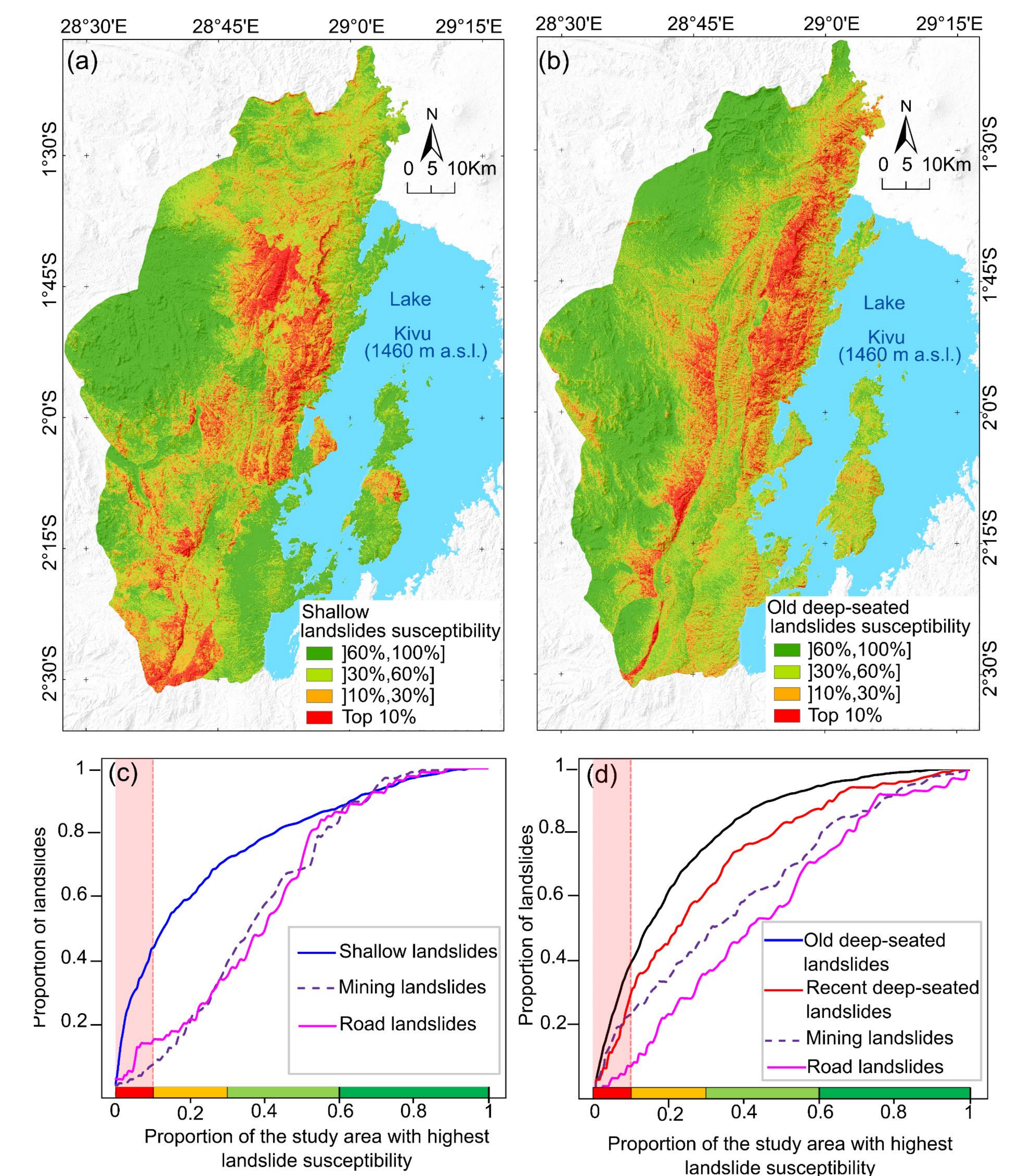


→ shallow landslides that occur in **forests** are strongly dependent on the slope gradient

→ In **forest loss areas** since the 1950's, shallow landslides are more frequent, but of smaller size, highlighting the role of forest cover on regolith availability and slope failure

→ In **permanent anthropogenic environment** deforested at an unknown earlier period before 1950's: shallow landslides are less frequent, larger, and occur on less steep slopes. This suggests a combined role between regolith availability and soil management practices that influence water infiltration

Factors of landslide occurrence: susceptibility analysis (a,b) and prediction rate (c,d)



→ **Shallow landslides**: controlled by forest dynamics and presence of roads and also by slope

→ **Old deep-seated landslide**: well predicted by natural factors. But **recent deep-seated landslide** not well predicted in this pattern that indicates natural factors contributing to their occurrence were either different or changed over time

→ **Mining and road landslides**: not well predicted by susceptibility models

Conclusion

- ❑ This research highlights the importance of human activities on the occurrence of landslides and the need to consider this context when studying hillslope instability patterns in regions under anthropic pressure
- ❑ Also, this study highlights the importance of considering the timing of deep-seated landslides and hence the added value of using historical aerial photographs for compiling an inventory

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