

## Overall comments

This article presents the findings of recent qualitative research into the use of road cut slope design guidelines in Nepal. It is a topical piece responding to a concerning rise in the number of landslides made possible by road construction in Nepal and more widely across The Himalayas. It is well written, logically structured, and accessible to specialists and non-specialists alike. The methodology is clearly set out and the results well presented. There are a good set of recommendations provided at the end of the piece, and it is clear that this work will support further work on this issue going forward. The manuscript is novel in that it really tries to get to grips with the issues as they arise “on the ground” with people involved in the process of road construction and, arguably, “disaster risk creation”. It is of obvious relevance to the case study in question but does well to highlight that the findings and implications could be applied, in a broad sense, to other LIC contexts. The manuscript could be improved if it linked to some wider questions and issues relating to disaster risk management and reduction, and reflected further on the limitations of the largely technical recommendations provided. The manuscript would probably benefit from including a literature/background section rather than what is a lengthy and dense introduction. Overall, whilst this is a *natural hazards* journal I think there is scope to bring in some perspectives from critical social scientific views of landslides and disasters: not least because this is a qualitative study focussing on the links between infrastructural development and risk.

## Specific comments

Below I will set out some specific suggestions in line with the points made above and in relation to a few specific points made in the manuscript which need revision and/or further elaboration.

### Introduction > introduction and background section

- In the introduction, could you include some more numbers/statistics on numbers of landslides (and landslides related to road construction), casualties, economic impacts, etc? Or maybe link to specific events/landslides etc. Something to grab the reader’s interest.
- I think the manuscript would benefit from splitting the current introduction into two sections. For the new introduction section, I would recommend moving the final paragraph of section 1 (109-119) to roughly line 30. This would probably mean you need to slightly rewrite the current final sentence to lead properly into a background section (lines 27-30). The paragraph lines 31-34 seems out of place and does not really add much to the manuscript. I would remove it. What remains would be the new introduction section with the new Background section becoming “In HICs” (line 35) onwards.

### New Background section

- You cover most of what is required here to set the context for the rest of the paper but some areas could be tightened and it could flow a little more logically and respond to wider theoretical/policy debates. In short, I think you need to emphasise more the importance of roads to landslide causation and then more explicitly set out how your research responds to this challenge. More specific suggestions below:
  - From around line 56 onwards you review the literature on trends of landslide causation in Nepal. Your overview of the range of physical processes which make Nepal landslide prone is solid. For instance, you cite KC et. al (2024) who find an uptick in landslide occurrence since 2011 and attribute this to changes in rainfall patterns and the 2015 Gorkha Earthquake. You then allude to physical factors not fully explaining landslide causation in Nepal from page 4 onwards. However, and

particularly in relation to the KC et. al paper, I think there is scope to expand on the reasons for this recent uptick in landslide activity and the centrality of roads to it. For example, you could cite Rosser *et al.*'s (2021) scientific study which clearly shows that the 2015 EQ can only be attributed to roughly half of the increase in landslide activity since 2015 (page 11). Instead, they suggest the signing of the 2015 constitution, 2017 elections, and ensuing investments into road infrastructure may well explain the disconnect between the expected number of landslides in their co-seismic modelling and actual landslide numbers. This also correlates with Petley *et al.*'s (2007) foundational paper on landslide causation in Nepal. Given the focus of your paper, it would seem important to be explicit about the centrality of roads to these issues and the scientific evidence which backs this claim up. At a theoretical level, this also helps link your analysis to the idea that disasters from complex interplays of processes which escape easy categorisations between the geophysical and the geopolitical (Donovan, 2017).

- The current paragraph from line 78 onwards disrupts the flow of the argument slightly. Some of the points here are useful but they are not well linked to the overall manuscript. To integrate it more, could you highlight the trade-off between the recent uptick in landslides and the fact that, as you say, *“the density of the total road network has more than tripled in the last three decades due to significant national and foreign investments aiming to improve economic and social development in Nepal through road construction”*. This seems like the kind of point you could use to highlight the policy problems your paper is responding to. It also situates the paper more firmly in the wider literature on disasters and development (Collins, 2009), and disaster risk management (Lavell and Maskrey, 2014; McGowran and Donovan, 2021).
- A related point here is that your current framing of HIC/LIC is oversimplified (even beyond the wider question of approaching questions of development through the unit of the nation state (see Horner and Hulme, 2019; Horner, 2020). I understand this is not a paper about “development” as such but given you are adopting this HIC/LIC framing it seems important to acknowledge there is a question of inequality here and the uptake of guidelines is ultimately tied into questions of power and resources. It may also be worth caveating that the uptake of guidelines is not perfect in “HICs” but that at base there is more capacity to accommodate the extra costs adhering to guidelines incurs. An example which springs to mind in terms of the complicated relationship between economic development, disasters, and adherence to building regulations would be Turkey. One or two sentences which acknowledge that these issues are tied into political and economic processes and questions which are beyond the scope of the paper to address in depth would be sufficient. Maybe you could signpost Ed Simpson’s 2021 book as an example of a text which engages with these questions more explicitly? Gurung’s *Geoforum* paper is already cited but is indicative of the kinds of questions I think you could reflect more on. Dinesh Paudel’s work on disaster reconstruction in Nepal also seems relevant (e.g. Paudel and Le Billon, 2020).
- Ultimately, I think this new background section needs to integrate the discussion of landslide causation, road construction, development, and the uptake of guidelines to highlight the importance of your study (which is novel in its focus on those actually involved in the construction process).

## **Results and discussion**

Assuming the literature review incorporates the above points, the results and discussion could do more to respond to these more fundamental and wide-ranging questions the manuscript raises.

Beyond the technical recommendations you make, are there more policy-focussed questions your study raises? For example, would there be scope to tie the guidelines and their implementation into Nepal's rapidly developing and increasingly important commitments and frameworks relating to Disaster Risk Reduction/ the Sendai Framework, etc? You allude to questions of politics and policy in section 4.2 but I think there is more to say here, maybe in the overall conclusion itself?

### Technical comments

Line 39 – Add a comma after “Normally”,

### References

Collins, A. (2009) *Disaster and development*. Routledge.

Donovan, A. (2017) 'Geopower: Reflections on the critical geography of disasters', *Progress in Human Geography*, 41(1), pp. 44–67. Available at: <https://doi.org/10.1177/0309132515627020>.

Horner, R. (2020) 'Towards a new paradigm of global development? Beyond the limits of international development', *Progress in Human Geography*, 44(3), pp. 415–436. Available at: <https://doi.org/10.1177/0309132519836158>.

Horner, R. and Hulme, D. (2019) 'From International to Global Development: New Geographies of 21st Century Development', *Development and Change*, 50(2), pp. 347–378. Available at: <https://doi.org/10.1111/dech.12379>.

Lavell, A. and Maskrey, A. (2014) 'The future of disaster risk management', *Environmental Hazards*, 13(4), pp. 267–280. Available at: <https://doi.org/10.1080/17477891.2014.935282>.

McGowran, P. and Donovan, A. (2021) 'Assemblage Theory and Disaster Risk Management', *Progress in Human Geography*, 45(6), pp. 1601–1624.

Paudel, D. and Le Billon, P. (2020) 'Geo-Logics of Power: Disaster Capitalism, Himalayan Materialities, and the Geopolitical Economy of Reconstruction in Post-Earthquake Nepal', *Geopolitics*, 25(4), pp. 838–866. Available at: <https://doi.org/10.1080/14650045.2018.1533818>.

Petley, D.N. *et al.* (2007) 'Trends in landslide occurrence in Nepal', *Natural hazards*, 43(1), pp. 23–44.

Rosser, N. *et al.* (2021) 'Changing significance of landslide Hazard and risk after the 2015 Mw 7.8 Gorkha, Nepal Earthquake', *Progress in Disaster Science*, 10, p. 100159. Available at: <https://doi.org/10.1016/j.pdisas.2021.100159>.