



## **Rumblings and Rainfall, Rebels, Remittances and Roads- The complex landscape of slope failure in Nepal**

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During the first monsoon season following the deadly 2015 Gorkha earthquake, 27 people were killed during two events in Nepal's Western Region due to debris flows triggered by a 24-hour, 315 mm cloudburst (Devkota et al. 2015). Both events were linked with roads: the first was caused by an accumulation of water on a newly constructed road above a steep, deforested slope, the second wiped out a major road and destroyed 10 houses. These deadly landslides were not triggered solely by extreme rainfall, but rather a complex combination of earthquakes, intensified rainfall associated with climate change and an explosion of unplanned rural road construction fueled by an increase in foreign investment, remittances and decentralisation of budgets and power from the central government to local villages. This complexity is explored through a trend data analysis on the number of landslides, landslide fatalities, rainfall intensity, and the road network in Nepal between 1980-2014 (McAdoo et al, submitted).

Of most concern are the poorly constructed roads in Nepal's Middle Hill districts (~1000-3000 m above sea level, humid, subtropical) as they are proliferating at an unprecedented pace without proper alignment, drainage, grading or maintenance. They are occurring in areas which frequently receive up to 4,000-5,000 mm of precipitation per year, causing considerable loss in lives, livelihoods and investment. Landslide fatalities increased from 88 on average for the period 1982-1995 to 130 deaths per year for the period 2007-2014 (Desinventar, 2016). Contrary to numerous studies which show a strong link between rainfall and landslides, our trend analysis demonstrates a decoupling of climate and the geomorphic drivers, pointing to other factors, namely the exponential road construction trend to explain the increase in landslide fatalities.

Nepal has some of the oldest manuals and well-trained cadres in low-cost green engineering practices, yet these are rarely applied. To reverse this deadly road-landslide trend, planners and policy-makers need to reconsider how to promote the country's infrastructure development, a central element to Nepal's sustainable development trajectory without causing further unnecessary human losses.

### References

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McAdoo, B.G, Sudmeier-Rieux, K. and S. Devkota (submitted) Roads in Nepal - Vehicles for Development or Disaster?