



## **The costs and benefits of reconstruction options in Nepal using the CEDIM FDA modelled and empirical analysis following the 2015 earthquake**

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Over the days following the 2015 Nepal earthquake, rapid loss estimates of deaths and the economic loss and reconstruction cost were undertaken by our research group in conjunction with the World Bank. This modelling relied on historic losses from other Nepal earthquakes as well as detailed socioeconomic data and earthquake loss information via CATDAT. The modelled results were very close to the final death toll and reconstruction cost for the 2015 earthquake of around 9000 deaths and a direct building loss of ca. \$3 billion (a).

A description of the process undertaken to produce these loss estimates is described and the potential for use in analysing reconstruction costs from future Nepal earthquakes in rapid time post-event.

The reconstruction cost and death toll model is then used as the base model for the examination of the effect of spending money on earthquake retrofitting of buildings versus complete reconstruction of buildings. This is undertaken future events using empirical statistics from past events along with further analytical modelling.

The effects of investment vs. the time of a future event is also explored. Preliminary low-cost options (b) along the line of other country studies for retrofitting (ca. \$100) are examined versus the option of different building typologies in Nepal as well as investment in various sectors of construction. The effect of public vs. private capital expenditure post-earthquake is also explored as part of this analysis, as well as spending on other components outside of earthquakes.

a) <http://www.scientificamerican.com/article/experts-calculate-new-loss-predictions-for-nepal-quake/>

b) <http://www.aees.org.au/wp-content/uploads/2015/06/23-Daniell.pdf>