

# Do the Rich Suffer Less Damage from a Natural Hazard? A Case of the 2015 Nepal Earthquake

## Abstract

It now becomes a consensus of both the practitioners and academic circles that there are no natural disasters. The so-called 'natural disasters' are jointly caused by natural hazards and social problems such as poverty and political disfunctions.

Several studies discovered that preparedness against natural hazards increases with income levels. Such an association between poverty and preparedness against natural hazards may raise a serious issue in empirical analyses. We may need sophisticated statistical procedures to estimate the impacts of natural hazards on the victims' welfare, because the damages are not only from the intensity of natural hazards but also from household (HH) characteristics: possible endogeneity problems. There are, however, few studies that statistically measured the association between social status (including income level) and the damages from natural hazards. This paper tries to add knowledge to the possible endogeneity of damages from natural hazards.

The information we utilize is the index of the damages that HHs suffered from the 2015 earthquake (EQ) in Nepal: NRA (Nepal Reconstruction Authority) data. We measure the gap between the magnitude of the EQ and the damage to the house, which should be zero if there are no impacts of HH characteristics. We use peak ground acceleration (PGA) and topographic slope using geographic information systems (GIS) to measure the gap.

NRA data show that the HH wealth has a certain correlation with the damage grade caused by the EQ over a wide area. The results infer the endogeneity of damages from natural hazards. Furthermore, from the regression analysis results using PGA shows that the characteristics of the house, such as the material, and the attributes of the HH, such as the age and cash income can be the endogenous factors. Cash income decreases in the damage grade of EQ. From this result, richer HH may suffer less damage from natural hazards in the study site. On the other hand, the damage grade is low when the house made of mud and straw. If other variables control for HH wealth, the traditional material house itself suffers less damage grade of the EQ.