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How can we better understand the risk and impacts of consecutive disasters in developing countries?

Marleen de Ruiter (1), Anaïs Couasnon1 (1), Marc van den Homberg (2), James Daniell (3), Joel Gill (4), and Philip Ward (1)

(1) VU Amsterdam - Institute for Environmental Studies, Water and Climate Risk, W&N C571, Amsterdam, Netherlands (m.c.de.ruiter@vu.nl), (2) Red Cross 510 GLOBAL. The Hague, The Netherlands, (3) Geophysical Institute and Center for Disaster Management and Risk Reduction Technology, Karlsruhe Institute of Technology (KIT), Karlsruhe, 76344, Germany, (4) British Geological Survey, Keyworth, NG12 5GG, United Kingdom.

In recent decades there have been striking cases of countries suffering from consecutive disasters. For example, Haiti being hit by a 7.0 magnitude earthquake in 2010 while still recovering from tropical storms and hurricanes that hit the island 18 months earlier. For first responders and disaster recovery agencies, it is crucial to improve our understanding of consecutive disasters and the implications for post-disaster recovery. Furthermore, the (re-)insurance and finance industry have yet to formalize the assessment of consecutive events. This need is underscored by climatic- and atmospheric hazards becoming more prevalent and subsequent damages costlier.

Preliminary analyses of global historic (1960 – 2017) consecutive events show that consecutive disasters of earthquakes (MMI > VIII) and tropical cyclones (tropical storms or higher intensity) can occur at short time scales (i.e. less than 30 days apart) which is especially relevant for decision makers. However, current state-of- the art regional and global models and their outputs do not allow for a thorough representation of consecutive disasters and their impacts. This is mainly due to the many challenges that are introduced by addressing and combining hazards of different nature and accounting for their interactions and dynamics.

In this contribution, we apply our global scale findings of challenges in assessing consecutive disasters to a case study of the Philippines. Here, the majority of its population is exposed to the threat of different natural hazards and we assess the risk of consecutive disasters from multiple hazards (including earthquakes, typhoons, floods and volcanic eruptions) from 1980 until 2016. Due to its high data intensity, this study uses disaster and impact data from many different sources, such as USGS (Earthquakes), IBTrACS (Typhoons), Smithsonian Institute GVP (Volcanic eruptions) and DFO (floods), supplemented with other local data collected by the International Red Cross. One of the prominent challenges remains the collection of spatially- and temporally dynamic exposure data.