



An innovation to Disaster Response: The Global RApid-post-disaster Damage Estimation (GRADE) Approach

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Rapid post-disaster damage assessment approaches and tools can estimate physical damage to man-made assets and consequent costs within a short period of time. Early knowledge on the likely economic damage and related losses, is critical not only for governments but also for the re/insurance industry. The Global RApid-post-disaster Damage Estimation (GRADE) approach developed by the World Bank, is able to provide an initial rapid (within two weeks) estimation of the physical post-disaster damage in terms of economic loss incurred, informing reconstruction requirements.

To quantify damage to a higher level of detail within the GRADE approach, disaster risk modelling techniques, in combination with historical damage data, census and socio-economic survey data, as well as satellite imagery, drone footage, and other media are used. GRADE prioritizes assessment in the housing and infrastructure sectors, followed by other sectors, such as transport and agricultural production (the latter in the case of hurricanes). Some of the outputs of GRADE include a) aggregated direct and indirect damage estimations by economic sector, b) potential impacts on gross domestic product (GDP) and the economy, and c) estimations of human casualties (in the case of earthquakes).

The GRADE approach was tested for the April 16, 2016, Mw 7.8 Ecuador earthquake. In terms of exposure to ground shaking, approximately 12.3 percent of the GDP was exposed to Modified Mercalli macroseismic intensity scale (MMI) VI (equivalent to slightly damaging ground motion). Thirteen (13) days after the event, the GRADE approach released loss estimates of USD 480 million for the residential sector. This loss estimate was over 96 percent of the detailed official report released value, forty-five (45) days after the event. Some challenges to the GRADE approach relate to relative lack of data on the distribution of assets in the non-residential sector, which are addressed empirically. However, the approach is increasingly and consistently being highlighted as an integral tool in rapid post-disaster response.

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