Recommendations

Earthquakes, volcanic eruptions and tsunamis are characterised as low-probability but high-consequence events. The assessment of the impact of such catastrophic events incorporates many fields of physical sciences, hazard modelling, engineering and social sciences. Neglecting any of these fields will inevitably reduce the accuracy, reliability and usefulness of the resulting risk metrics. The process of risk identification should involve stakeholders from the public and private sectors and should leverage ongoing national and international initiatives with the mandate to calculate, communicate and reduce geophysical risks.

In the past two decades or so, the European Commission has supported a large number of projects that have significantly advanced the science of earthquake, volcanic and tsunami hazard modelling and risk assessment. Other national and international programmes have also produced datasets, models and tools that are fundamental for the assessment of geophysical risks. Leveraging on this wealth of resources will reduce the replication of efforts. It is also important that the international community investigates efficient approaches to, and develops standards and best practices for, hazard and risk assessment based on existing risk knowledge to enable effective DRM, including preparedness and emergency planning.

Existing instrumental networks support EWSs mainly for earthquakes and tsunamis and, to a lesser degree, volcanic eruptions. However, major gaps still exist in the instrumental coverage of large areas. The present performance of TWSs for the protection of populations should be improved by filling the gaps in these networks. However, even the most advanced EWSs are not effective without a well-trained downstream component. Geophysical risk mitigation thus requires synergies between the scientific and technological community, civil protection authorities and other stakeholders. The common aim should be continual exercises and training, education and public awareness; this is vital, since the public perception of risk from infrequent events naturally tends to fade over time, until the next catastrophe happens.

Geophysical risk assessment is fundamental to incorporate the wide spectrum of uncertainties from the different risk components (hazard, exposure and vulnerability). Satellite imagery and VGI are enabling the characterisation of the built environment with unprecedented temporal and spatial detail. Moreover, the development of risk-reduction strategies not only should rely on the direct (or physical) impact, but should also incorporate socioeconomic aspects, thus considering the capability of the society to recover from destructive events.