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This contribution from the Global Volcano Model Network (GVM) and the International Association for Volcanology and Chemistry of the Earth's Interior (IAVCEI), on the status of global volcanic hazards and risk assessment capability for the United Nations Office for Disaster Reduction (UNISDR) Global Assessment Report for Risk Reduction 2015 (GAR15 Report) is an extremely timely and important reminder that there is still a huge amount of work to be done. GVM is a collaborative international initiative, involving multiple research and government institutions, in collaboration with IAVCEI, and has as its mandate "to create a sustainable, accessible information platform on volcanic hazard and risk". This task would be difficult for any learned association or institution by itself, and has required funding and logistic support from multiple international sources.

Over 130 scientists from 86 institutions in nearly 50 countries worldwide have contributed to this work, representing a remarkable collaborative effort of the volcanological community. The World Organisation of Volcano Observatories (WOVO) is a key Commission of IAVCEI and has contributed to profiles of volcanism for the 95 countries or territories with active volcanoes.

This book provides a state-of-the-art assessment of the preparedness of the global scientific community and government agencies to manage volcano hazards and risks globally. It demonstrates alarmingly that adequate information to make informed hazard and threat assessment exists for only 328 (about 20%) of the Earth's 1,551 "active" volcanoes that are known to have erupted during the Holocene (<10,000 years). The situation is even more concerning when considering that there are many dormant volcanoes that have not erupted in the Holocene, but could still erupt.

This situation clearly indicates that much more needs to be done by governments worldwide to improve both the monitoring capabilities for all the known active volcanoes, and as importantly, undertake detailed investigations of the geological histories of all known active and dormant volcanoes.

Monitoring provides only a modern snapshot of the level of activity or unrest of volcanoes, which is crucial to assessing if volcanic eruption is imminent. Seismic and geodetic networks are core to such monitoring, as is gas sampling and analysis. Development of modern airborne and ground-based remote sensing technologies and data sets are now also enhancing our abilities to assess unrest at volcanoes.

However, even if an eruption is imminent, without a database on the eruption history, the frequency and magnitude of eruptions, and the previous eruption styles of a volcano, trying to predict the most likely hazards and their magnitude, becomes poorly constrained guesswork. *Understanding the geological history of volcanoes is one of the most important tools in modern*

volcano hazard and risk assessment. Understanding the previous behaviour of a volcano requires a programme of careful geological mapping, providing data on the dispersal patterns and stratigraphic occurrence of the spectrum of deposit types and their magnitude. Together with knowledge of the geochemistry and geochemical evolution, and a well-constrained geochronological framework of events, factually-based hazard and risk assessment is only then possible.

Sadly it seems that such basic and essential geological knowledge is lacking for almost 80% of the world's active volcanoes! Is this a function of inadequate funding, or an assumption that geological and stratigraphic fieldwork is old fashioned and no longer relevant, or both? This requires urgent attention.

Undertaking geological mapping of volcanoes need no longer be tedious and require covering every square metre of a volcano. Modern remote sensing databases such as Aster, radiometrics, aeromagnetism, LiDAR, etc, offer fast, smart ways of producing first-order maps of volcanoes, that can then be ground-truthed in strategic areas to confirm apparent stratigraphic superposition relationships, evaluate deposit types, collect samples for geochemistry and geochronology, and efficiently produce an assessment of the geological history, eruption styles, deposit types, eruption magnitudes, hazards and risks.

Having compiled a geological database through collaboration with the Smithsonian Institute's Global Volcano Program (GVP), GVM has introduced a Volcano Hazard Index (VHI) for each volcano for which there is an adequate geological record. This important new innovation begins to provide an overview of the range of possible hazards for a particular volcano, the likelihood of specific hazards occurring, and their magnitude, based on the previous history of the volcano. I am pleased to note that just this year to emphasise the importance of understanding the geology of volcanoes, Secretary-General of IAVCEI, Joan Marti, organised an international workshop on the theme of "The geology of volcanoes" on the volcanic island of Madeira. A proposal to form a new IAVCEI Research Commission on this theme is now being prepared.

In addition, measures of the populace exposed to volcanic hazards are introduced to better understand the volcanic threat. A significant statistic of the report is that 800 million people live within 100 km of active volcanoes, 226 million live within 30 km and 29 million live within 10 km. This again highlights the importance of developing a better understanding of volcanic hazards and their impact.

The report also briefly addresses the potential economic impacts of volcanic events, which as global populations increase are just likely to rise. The 2010 Eyjafjallajökull eruption in Iceland was a startling wake-up call on this.

In summary, the GAR15 Report on Global Volcanic Hazards and Risks is a stark reminder that there is still a huge amount of work to be done in understanding the hazards and risks of the world's volcanoes. Major investments are required not only in acquiring and deploying more monitoring equipment on more volcanoes, but also for undertaking ongoing geological mapping and fieldwork to improve understanding of hazards and risks on all active volcanoes.

On behalf of IAVCEI, I congratulate GVM and everyone who has contributed to the GAR15 Report, most of whom are members of IAVCEI. The GAR15 Report will provide UNISDR, governments, IAVCEI and its members with much to consider.