

## Forensic Analyses of Volcanic Eruptions

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Understanding how natural hazards become disasters is extremely complex. One way to uncover the underlying drivers behind a disaster is to combine spatial and temporal analysis of the physical processes that trigger the hazardous event with their evolving impacts and their dynamic interaction with pre-existing social and physical vulnerabilities. The Strengthening Resilience in Volcanic Areas research project has taken an interdisciplinary, retrospective ('forensic') approach to the analysis of several volcanic eruptions. The aim is to use our new understanding of the drivers to risk to improve how it might be characterised, analysed and monitored across differing volcanic settings to strengthen resilience to future eruptions. Two long-term eruptions (Soufriere Hills [Montserrat] and Tungurahua [Ecuador]) were analysed and our forensic methodology was tailored at settings with more transitory activity (Soufriere [St Vincent] and Nevado del Ruiz [Colombia]). Our interdisciplinary analyses were guided by forensic workshops - intensive in-country evidence gathering exercises set within social capital-building activities. These were designed to bring together STREVA researchers with in-country scientists, local decision makers, emergency managers and citizens. Our settings usually had an existing overview of past monitored activity but rather less information on the social impacts of that activity. Much of our subsequent information gathering focused on those aspects. In all settings, we found that the eruption(s) exerted a strong influence on livelihood trajectories in the longer term, tending to exacerbate pre-existing inequalities. For the long-lived eruptions, adaptations in risk management enabled local populations to live in relatively close proximity to volcanic activity with rapid short-term responses to renewed or increased activity. We also found that the success and effectiveness of communication processes is a key feature in adaptation and recovery across all settings.