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Setting up a volcanic hazard and risk knowledge database: risk and hazard mapping, WebGIS mapping and scenario building within the MIAVITA project

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Abstract

Efficient volcanic risk management has three objectives to focus on: (1) Prevention tools based on risk assessment during rest periods of the volcano; (2) Crisis management capabilities during alert and eruptive periods; (3) Recovering capabilities (resilience) after event has occurred. Within the MIAVITA projects, these objectives are addressed over four selected volcanoes (Merapi in Indonesia, Kanlaon in the Philippines, Fogo in Cape Verde and Mount Cameroun in Cameroun) through the use of structured geographical information that form the baseline information for (1) geological hazards and risk maps: interpreting maps at the volcano's scale; (2) WebGIS: using interactive maps: to display, in real time, relevant information following a specific demand (e.g. population at risk versus health centres' positions) and (3) scenarios: description of the effects and impact for a given eruption (real/occurring or hypothetical).

This paper discusses the various approaches available for setting up a user-oriented volcanic hazard and risk knowledge database and discusses how to adapt the methodology developed at Merapi volcano to other environment.

When sufficient information is available, geological hazard maps can be produced by crossing events expected intensity with their frequency as Thierry et al. (2007) did, or by sectoring the volcano and producing event trees (Marzocchi et al., 2007, Neri et al., 2008). These two approaches can be merged when sufficient information is available, which is not always possible. In such case, simplifications must then be found. Because of the multiplicity of factors involved, risk mapping happens to be appropriately addressed through a "decision support" multicriteria methodology (Saaty et al. 2008), which has been applied by BPPTK / CVGHM on Merapi. Because of its flexibility, this risk mapping methodology appears

transposable to other environment with some restrictions. WebGIS use and scenario building approaches are also briefly discussed in this presentation.

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