



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

Gonéri Le Cozannet, Pierre Thierry, Marco Neri, M. Surono, M. Subandriyo, Nandaka Agung, Nurnaning Aisyah,, M. Miswanto, R. Solidum, A. Daag, et al.

► To cite this version:

Gonéri Le Cozannet, Pierre Thierry, Marco Neri, M. Surono, M. Subandriyo, et al.. Setting up a volcanic hazard and risk knowledge database: risk and hazard mapping, WebGIS mapping and scenario building within the MIAVITA project. EGU 2011, Apr 2011, Vienne, Austria. hal-00567706

HAL Id: hal-00567706

<https://brgm.hal.science/hal-00567706>

Submitted on 21 Feb 2012

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

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

Le Cozannet G. (1), Thierry P. (1), Neri M. (2), Surono (3) Subandriyo (4); Agung Nandaka (4); Aisyah, Nurnaning (4); Miswanto(4); Solidum R. (5), Daag A. (5) Faria B. (6), Kouokam E. (7), Bagni M. (8), Canestro A. (8), Salvati A. (8), Vagner, A. (1), Quinet, C. (1).

(1) BRGM, Orléans, France

(2) INGV, Catania, Italy

(3) Center of Volcanology and Geological Hazards Mitigation, Bandung, Indonesia

(4) CVGHM / BPPTK, Yogyakarta, Indonesia

(5) Philippines Institute of Volcanology and Seismology, Manila, Philippines

(6) National Meteorological and Geophysical Institute, Cape Verde

(7) Ministry of Industry, Mines and Technological Development, Yaoundé, Cameroun

(8) KELL, Roma, Italy

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.

The MIAVITA project is financed by the European Commission under the 7th Framework Programme for Research and Technological Development, Area “Environment”, Activity 6.1 “Climate Change, Pollution and Risks”