



First level inspection by trained-volunteers of torrent control structures in mountainous catchments: Towards a quality-evaluation of data collected

V. Juliette Cortes (1), Marie Charrière (2), Zar-Chi Aye (3), Giulia Bossi (1), Alessia Viero (1), Simone Frigerio (1), Luca Schenato (1), Simone Sterlacchini (4), Thom Bogaard (2), and Alessandro Pasuto (1)

(1) National Research Institute for Geo-hydrological protection, CNR-IRPI, Padova, Italy, (juliette.cortes@irpi.cnr.it), (2) Delft University of Technology, Delft, The Netherlands, (3) Centre de recherches en environnement terrestre, Faculté des géosciences et de l'environnement, Université de Lausanne, Lausanne, Switzerland, (4) CNR-IDPA, National Research Institute for the dynamics of environmental processes, Milano, Italy

Modern approaches for emergency management promote exchange of information between local authorities and community aiming at more appropriate and effective ways to manage hydro-meteorological risks¹. In this framework, risk communication should not only start during the build-up of the hazard, but also in pre-warning and 'peace' time and it contribute to better emergency preparedness. Lately, a rapid growth of interest emerges to enable citizens to inspect hazard-related processes on their territory². From the risk managers perspective, substantial advantages of taking this citizen-based approach include (1) the opportunity to identify on a quick and 'relatively' low cost basis one or more risk components at different geographical locations and (2) the ability to provide a practical application for citizens interested in creating and communicating useful information toward establishing a better understanding of their territory. From the citizens perspectives, it provides the opportunity to generate benefit through increasing and encouraging interest for self-awareness as well as self-preparedness. However, the use of citizen-based information also bring forth the need to train and establish standardized forms, guidelines and tools, particularly if the data collected seek to be useful information for decision-making activities and emergency management³.

In this research work, we address the question on the quality of data collected by volunteers for decision-making activities. This in the framework of the civil protection organization of the Friuli-Venezia-Giulia (CP-FVG) and the Italian study area of the CHANGES project, Municipality of Pontebba⁴. An experiment is carried out by analyzing the results of a questionnaire form dealing with the inspection of the functional status of check dams and bridges across streams. This form is filled by volunteers (in this case, citizens and university students), that register to a web-portal with access by browser after a standardized training given by practitioners and scientists. During the latter, the guidelines to fill the questionnaire, i.e. various conditions of hydraulic structures and the proposed criteria for quality evaluation⁵, will be disseminated to the volunteers. The quality of the data are analyzed on the basis of these guidelines in order to determine if the citizens-based data collection approach can be used to prioritize the structures to be inspected by the risk managers.

¹ Enders, J. 2001. *Measuring community awareness and preparedness for emergencies*. Australian Journal of Emergency Management, Spring: pp. 52-58

² Yetman., K. 2002. *Using Maryland's stream corridor assessment survey to prioritize watershed restoration efforts*. Journal of the American Water Resources Association. Vol 38. No4

³ Goodchild, M.F. & Li, L. 2012. *Assuring the quality of volunteered geographic information*. Spatial Statistics 1 (2012) pp. 110–120.

⁴ Marie Curie ITN Changing Hydro-meteorological Risks as Analyzed by a New Generation of European Scientists (CHANGES) is funded by the European Community's 7th Framework Programme FP7/2007-2013 under Grant Agreement No. 263953.

⁵ EPA, 1997. *Volunteer Stream Monitoring: A Methods Manual*. EPA 841-B-97-003. Water Division Region 10, Seattle Washington.