



The SISTEMA Project contribution in the implementation of the GEO Geohazards Supersite initiative

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SISTEMA Project has been funded by the PO FESR 2007-2013 action, supported by the Campania Region (Italy). The project fosters the integrated use of multidisciplinary data in order to improve the understanding of the volcanic processes at Campi Flegrei and Ischia and to progress in science and surveillance of the territory according to the rationale of Supersite GEO initiative to Campi Flegrei, currently identified as Permanent Supersite. The mission of SISTEMA is to upgrade the existing monitoring and surveillance systems through the design, purchase and installation of new instrumentation, equipment, technology and methods addressing the need of delivering, with improved rapidity, scientific information for decision makers and end-users.

The redundancy of monitoring systems is an important issue to guarantee the full operability during emergencies. The Monitoring Centre of INGV-Osservatorio Vesuviano is currently located within the red zone (potentially at risk of invasion by pyroclastic flows in case of eruption) of Campi Flegrei volcano. Its position offers various logistic benefits but at the onset of a volcanic crisis, of course it will be required to shift this Center in a safer area. For this reason, within the SISTEMA project, we envisioned a backup system which, when needed, could guarantee a shift of the Center in a virtually zero time. This can be achieved by fully duplicating the processing system and the data storage. In case of emergency, it would be required only to switch on the visualization systems in the new Center and transferring the personnel involved in the surveillance activities.

SISTEMA project has also enabled the development of a permanent GPS and CRs (Corner Reflectors) networks, the latter supporting SAR Interferometry, by helping to improve knowledge of the Campi Flegrei deformation field, both on local and wide scale.

In addition, in order to enhance the heat flux measurements from ground based thermal camera observations, the permanent thermal infrared imagery monitoring network operating at Campi Flegrei has also been improved. Furthermore, an innovative method based on drone-borne IR cameras has been developed in order to measure the time variations of heat flux and chemical emissions. This will boost the definition of the activity state of a volcano allowing a better assessment of the related hazard and risk mitigation through the design and installation of two drones equipped with thermal camera.

The impact of SISTEMA project is measured through the implementation of its services, the continued and further engagement of different stakeholders and the delivery of crucial communication for decision makers and end-users. The research promoted by its multidisciplinary data can have a crucial impact on the advancement of the Emergency Plans, contributing to a safe and sustainable society and economic development, geo-hazards assessment and a sustainable management of geo-resources.