

Earth Science knowledge and Geodiversity awareness in the Langhe area

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Hills of Central Piemonte Region (Langhe, Monferrato) have a range of geological and geomorphological features that make them very attractive for both viticulture and tourism activities. Particularly, the Langhe area, located at the inner margin of the SW-Alps, is part of the Piedmont Basin (PB) a Late Eocene-Miocene succession composed by continental, shallow and deep marine deposits. Its monocline structure caused the present-day characteristic "cuestas" morphology of the Langhe hills. Quaternary evolution of river network is here characterized by the effects of the Tanaro piracy.

Despite of its rich geodiversity and even if on 2014 the area has been included within the UNESCO WH, its recognition is limited to cultural heritage. In fact, a comprehensive use of Earth science knowledge in the assessment of natural heritage of this area is still lacking. As a consequence, geoheritage is under-recognized as well as endangered by both natural hazards and increased human "pressure".

The geodiversity loss in the Langhe area is thus due either to human activities, i.e. high mechanization of viticulture activities in the last 30 years, particularly for new vineyards installation, or to active geomorphological processes, such as planar slide, flow, soil slips and floods. The Langhe area is in fact highly sensitive to climate change and prone to these processes.

In term of "human sensitivity", several sociological surveys have shown that "perceived risk", not "real risk", influences people's behavior towards natural hazards. The same approach can be applied to geodiversity and geoheritage. Based on these assumptions, we considered the possible strategic roles played by dissemination of scientific research and application of new technologies: 1) to enhance awareness, either of geodiversity or environmental dynamics and 2) to improve knowledge, both on geoheritage management and natural risk reduction.

Within the activities of the "PROGEO-Piemonte Project" we performed a systematic review of geodiversity and natural hazards information in the Piemonte Region (NW-Italy) leading to the identification of 9 strategic geothematic areas: one of these is the Langhe area.

For enhancing geoheritage we propose a multidisciplinary approach based on the use of geomathic (UAV, GIS, Virtual Globes) and the diffusion of scientific knowledge on the Langhe area.

We first focused on promoting and protecting the existing geosites. Their peculiar geological, geomorphological and paleontological characteristics have been described, then new geosites searched, through field activities on geological mapping. Second, we focused on the production of geothematic maps and promotional materials for locals and tourists; in this phase we proposed meeting and field trip for the promotion and discovery of geodiversity. Since the Langhe area shows important links between geology and wine, we also started analyses on geological components of terroir, first with the local producer, and then with tourists.

As final results, better recognition of the economic value of geodiversity and stronger perception of both geoheritage and natural hazards have been achieved. Valuable contributions to reduce local vulnerability to natural disasters and to support a territorial integrated quality management system of geoheritage have been achieved, suitable for tourism and sustainable development.