# Geological characterization of agricultural terraces as a tool for the territorial safeguard and for the valorization of "Terroir"

Gerardo Brancucci (1), Michele Brancucci (2), Pietro Marescotti (3), Eugenio Poggi (2), Monica Solimano (2), Roberto Vegnuti (2), Paola Giostrella (4), and Paolo Tarolli (5)

(1) Department of Architecture and Design, Polytechnic School, University of Genova, Italy (brancucci@arch.unige.it), (2) GeoSpectra s.r.l. Spin off, University of Genova, Italy (info@geospectra.it), (3) Department of Earth, Environmental and Life Sciences, University of Genova, Italy, (4) Indipendent Geography Researcher, Italy, (5) Department of Land, Environment, Agriculture and Forestry, University of Padova, Italy

The progressive abandonment of the terraced areas of Liguria (NW Italy) is determining an inexorable land degradation, which causes, among other things, the erosive processes and the slope failure. Several studies highlighted the need of strategies for the recovery of abandoned agricultural lands by encouraging the productive reuse. Nevertheless, it is well known that agricultural activities in rural areas with steep slopes are strongly penalized by the high production costs determined by the adverse geomorphological conditions. For these reasons, one of the possible solutions is to encourage the production of high-quality agricultural crops, and to promote the uniqueness of the products. The uniqueness of the local products can be promoted not only by means of marketing strategy, mostly based on historical and traditional aspects of the productions, but also by correlating the product with the geological features (e.g., lithology, mineralogy and geochemistry) of the agricultural soils and parental rocks. These features are typically peculiar of a geographic area and thus strictly correlated with the site of production. This approach, together with the biological characterization of the crop, can link the cultivar to the geographical area of production thus evidencing peculiarities that are inimitable elsewhere.

With this work we present the experimental results of investigations performed on several types of agricultural products (grapes and wines, olives and olive oils, apples) as well as on wild mushroom of the Boletus family. The analyses have been carried out either in laboratory and by means of field portable instruments (FP-EDXRF and FP-FTIR) which permitted a large number of in situ analyses, in a cost efficient and timely manner, thus allowing the realization of high spatial resolution compositional maps. This analytical approach also resulted particularly effective to improve the information obtained by traditional pedological and agronomical investigations.

The results allowed to realize the "geological label of the product[®]" which is an assurance label that certifies the peculiar geological features of the area of production. The label contains a QRcode which allows to obtain detailed information about the soil composition, geological and geomorphological information and their relationships with the organoleptic characteristics of the product.

The geological label of the product may have significant implications for the sales and marketing chain since it allows to commercialize higher value product characterized by: i) organoleptic and environmental quality; ii) uniqueness of the area of production; iii) geographical identity of the crops. By associating these information with the valorization of the terroir, the territorial marketing may be strongly improved ensuring the development of the territories and the realization of a closer relationship between the customer, the Company and consumers.

The value created by this potential brand can attract investment for the recovery of abandoned agricultural lands and for the agricultural terraces management with positive effects on the increase of productivity and, consequently, on the maintenance, management and territorial safeguard.