

# Landscapes and Wine: how to communicate Geology following a cultural approach

Francesca Romana Lugeri <sup>1</sup>; Barbara Aldighieri <sup>2</sup>;  
Gianluigi Giannella<sup>3</sup>; Alberto Cardillo<sup>1</sup>

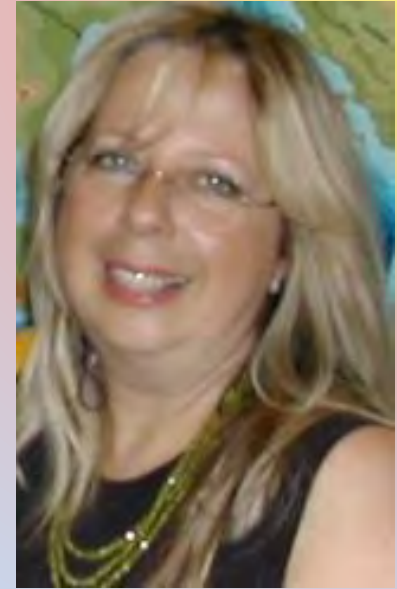


(1) *ISPRA - Istituto Superiore per la Protezione e la Ricerca Ambientale Roma.* [francesca.lugeri@isprambiente.it](mailto:francesca.lugeri@isprambiente.it); [alberto.cardillo@isprambiente.it](mailto:alberto.cardillo@isprambiente.it)

(2) *CNR IDPA Istituto per la Dinamica dei Processi Ambientali. Milano* [barbara.aldighieri@idpa.cnr.it](mailto:barbara.aldighieri@idpa.cnr.it)

(3) *Ordine Geologi Lazio. Roma.* [tesoriere@geologilazio.it](mailto:tesoriere@geologilazio.it)


**We dedicate this work to Lucilia Gregori,  
Professor of Geomorphology at the  
University of Perugia, dead in January 2012:  
she has been for many years a protagonist  
in the field of research on geology and  
wine, following an approach that integrates  
nature and culture. She proposed the new  
term “Winescapes” to denote the link  
between the wine landscape and the so  
called “Terroir”.**



**One of the most important projects created  
by Lucilia Gregori, within the University of  
Perugia  
and the “Geology and Tourism” Italian  
Association,  
is to provide labels that tell the geology of  
the land where wine is produced.**



**Wine and wine production are very important in many cultures, and play a determinant role in local as well as in global economic development.**



**In the Italian culture, vineyard cultivation is a well known kind of land use; the wine production represents an activity full of significance.**

**In the Italian territory, relatively narrow and elongated and full of different land settings, the geologic and geomorphologic system influences strongly the land use arrangements. Vineyards are linked to the ground more than other kinds of cultivation, through many scientific, social and cultural reasons, as testified by history, religion, myths.**

A close-up photograph of a hand holding a glass of white wine. The glass is filled with a golden-yellow liquid and is held against a background of a vineyard with rows of grapevines under a clear blue sky. The text is overlaid on the image in a bold, blue font.

**In the last years, a new current in the field of Earth sciences has proposed a new theoretical approach that integrates nature and culture, offering new powerful tools for educational programs and for a new dialogue between researchers and territorial managers.**

**The link between Earth, Landscape and Wine is a link between Nature and Culture. It is essential to try a new kind of popularization of scientific heritage, in order to involve the whole society in a common action towards a sustainable territorial management.**

## Shape is Synthesis *Aristotele*



Vasily Kandinsky, *Landschaft mit roten Flecken, Nr. 2, 1913.*

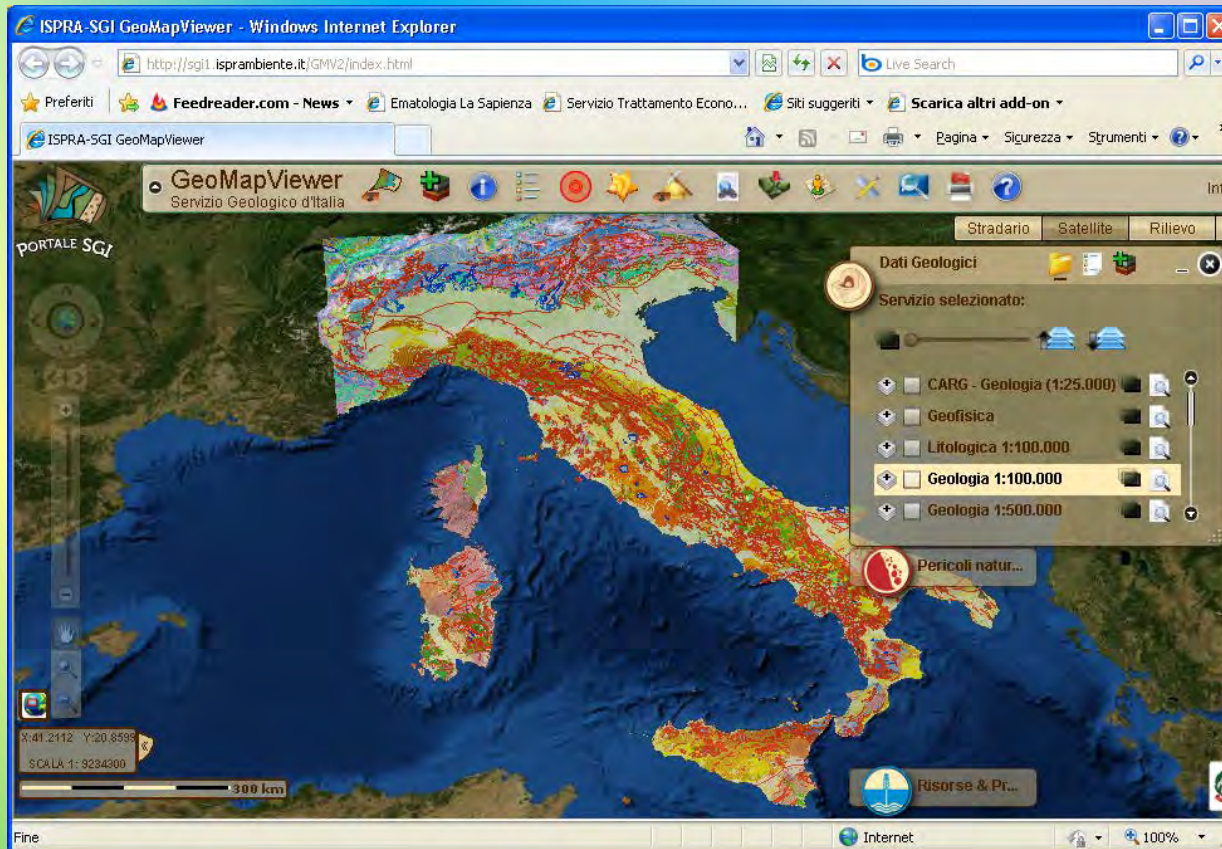
Landscape  
is the result  
of interaction  
among  
physical,  
biotic and  
anthropic  
phenomena  
acting in a  
different  
spatial-  
temporal  
scale  
(Foreman &  
Godron)

**Each wine has its own natural and cultural landscape. Landscape is the result of the interaction of many natural and cultural components.**

**Referring to the deep link among landscape, terroir and geomorphology, some kinds of vineyards can be considered as a precious kind of geoheritage. These areas need a special management, in order to safeguard both of the aspects (natural and cultural) and to apply well balanced programs for the local development, that promote the typical production -referring to wine- and its special link with the Landscape.**



**A very useful tool for the territorial planning and management, can be represented by maps and GIS: by integrating many different information we can analyze the link between vineyard cultivation and landscape, referring to the geomorphological settings.**



**Data and informations are organized in GIS.**

**A GIS must hold a wide range of information on the physical, biotic and anthropic environmental components and evaluate their inter-relations,**

**GIS are flexible, multi-scale, dynamic, updatable tools. The different scales of analysis allow us to consider the object of study from different points of view**

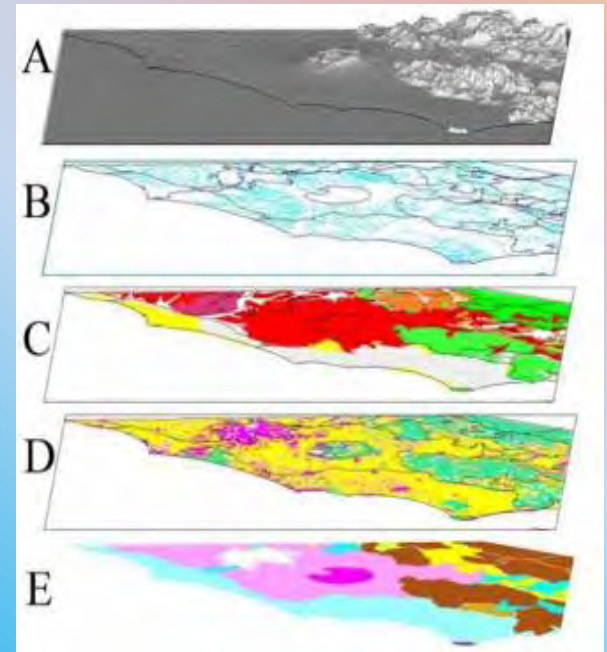
Each individual landscape, studied at different scales, shows distinctive elements; at a synthetic scale (e.g. 1:250.000 scale) physiography is the feature that best approximates the results of a landscape classification performed following an holistic approach

The considered parameters are mainly related to the morphologic settings and to geologic and landcover settings. The parameters and the physiographic components considered in Landscape analysis are:

- Elevation and energy of relief (A)
  - Drainage pattern (B)
  - Lithology (C)
  - Land use (D)

- Landscape physiographic Units (E)
- Integrating these components and the gathered data is possible to identify and describe the

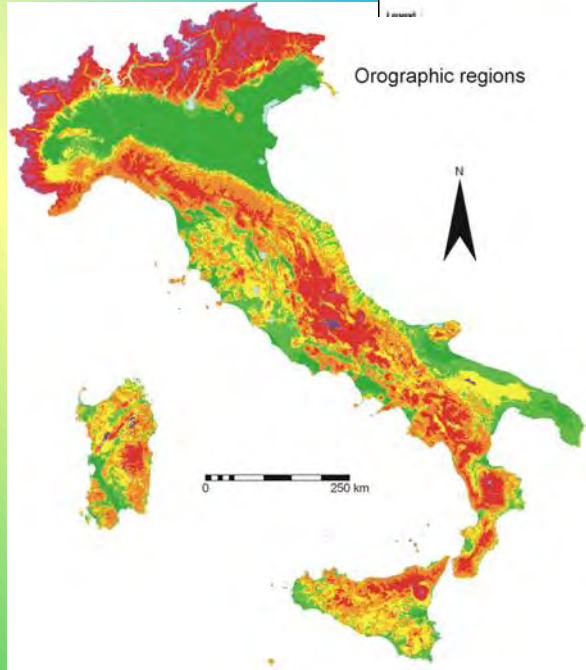
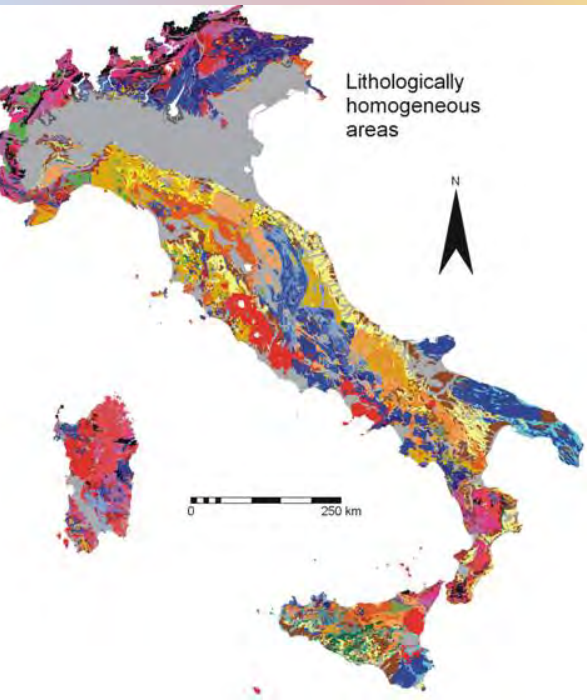
so called Landscape Physiographic Units.



*Landscape parameters and physiographic components*



By integrating different maps and related database, can analyze the link between vineyard cultivation and landscape, referring to the geomorphological settings .



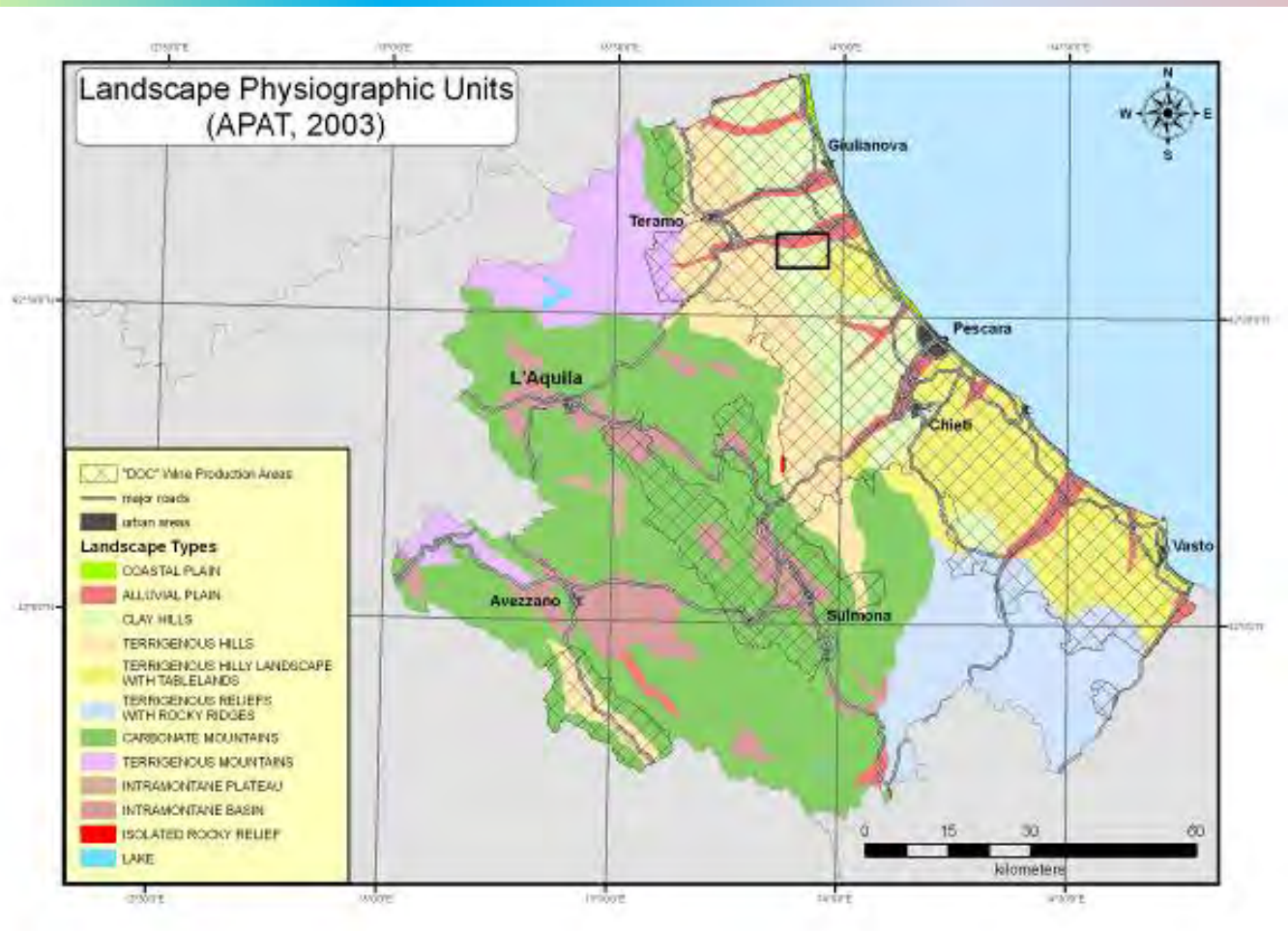
overlaying the thematic maps, such as the Geologic and the Physiographic ones, and integrating the gathered data, we can identify within a reasonable approximation, those areas of both natural and cultural importance.

**Some association of natural and cultural landscape are so peculiar and rare, to become worthy of a special protection and valorisation**

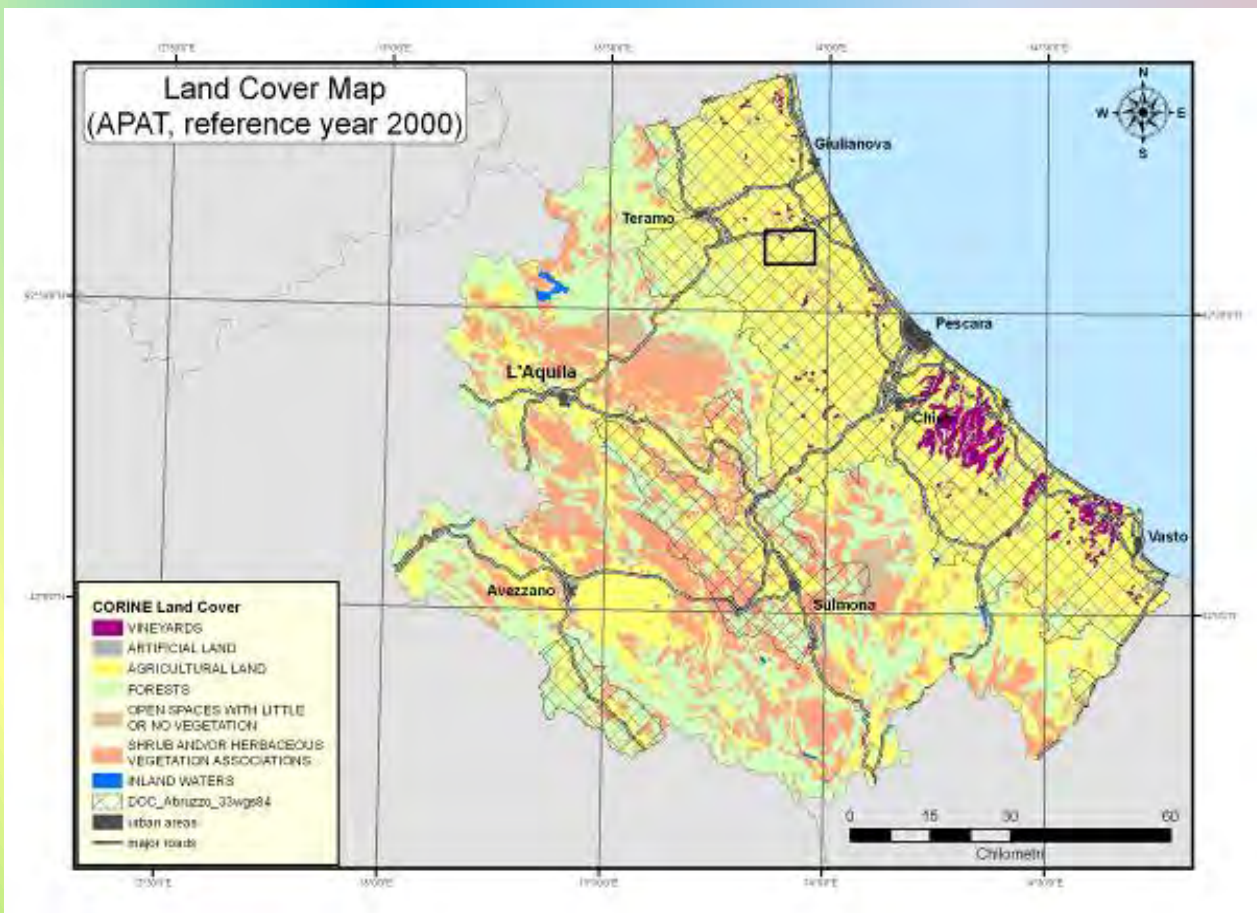


ph: [www.maurocantoro.it](http://www.maurocantoro.it)

**A particularly interesting case, in Italy, is found in the Abruzzo region where we integrated the data relative to various thematic studies (projects realized by various research institutions) and verified the possibility of utilizing the Landscape Units, recognized and mapped at different scales of analysis, in order to interpret by landscape, the distribution of areas suitable to the different grape varieties and wine making**



The most part of the production is located in the so called “terrigenous hills and tableaux” and in “clay hills”: it could seem intuitive, but inside this simple consideration there is a lot of data and information, useful in comparison with other areas, or in monitoring practices.

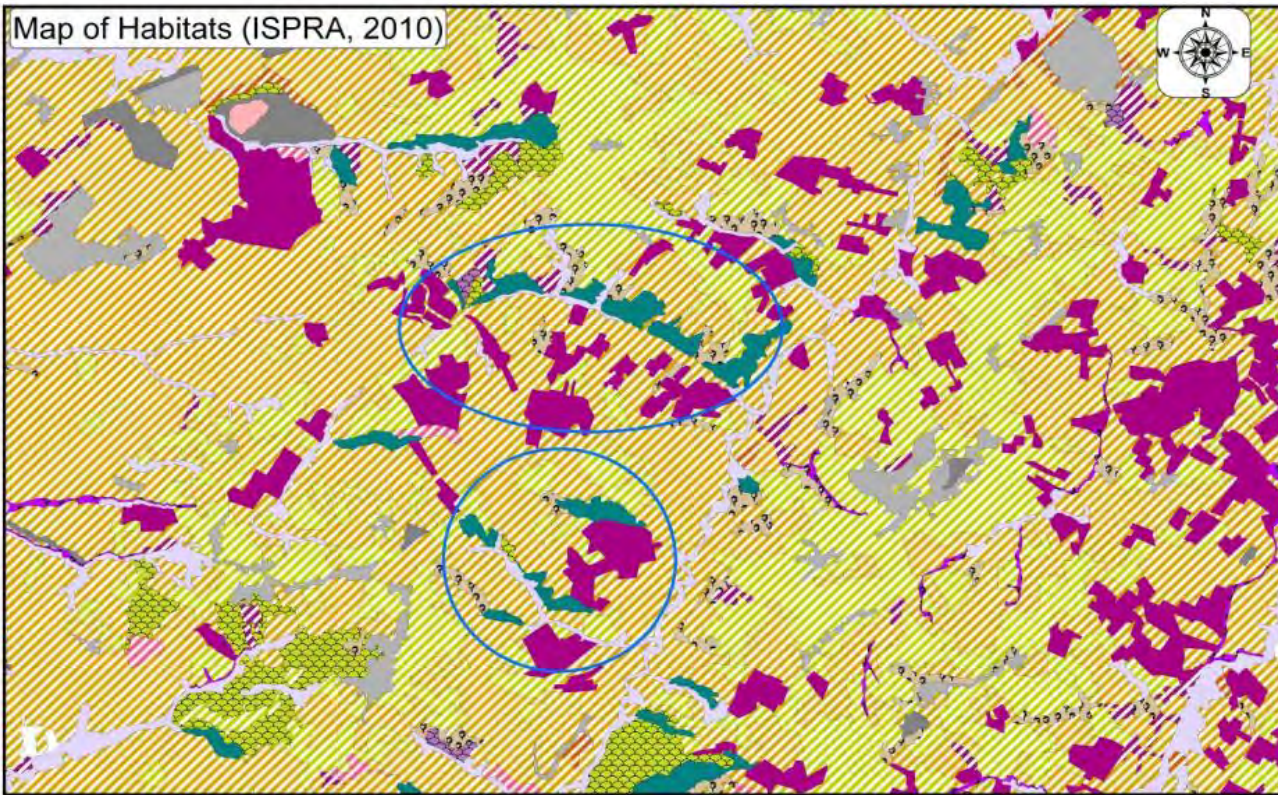


At a more detailed scale, starting again from the link between vineyard cultivation and landscape, referring to the geo-morphological settings, we can analyze the possible evolution of the vineyard cultivation and wine production-

the replanting of old vines in protected areas, as an experiment to integrate cultivations and culture, in a local approach.

Moreover, it's possible to recognize and identify some peculiar landscapes, to submit a protection as geoheritage.

Map of Habitats (ISPRA, 2010)



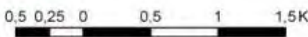
**CORINE BIOTOPES**

- 15.83 - BADLANDS
- 31.81 - MEDIO-EUROPEAN MID SOIL THICKETS
- 31.8A - SUB-MEDITERRANEAN DECIDUOUS THICKETS
- 41.732 - SOUTHERN MEDITERRANEAN QUERCUS PUBESCENS WOODS

- 42.1B - FIR REFORESTATIONS
- 44.13 - WHITE WILLOW GALLERY FORESTS
- 44.61 - MEDITERRANEAN RIPARIAN POPLAR FORESTS
- 82.3 - EXTENSIVE CULTIVATIONS
- 83.11 - OLIVE GROVES

- 83.15 - FRUIT ORCHARDS
- 83.21 - VINEYARDS
- 83.31 - CONIFER PLANTATIONS
- 83.324 - LOCUST TREE PLANTATIONS
- 83.325 - OTHER BROAD-LEAVED TREE PLANTATIONS

- 86.1 - TOWNS, VILLAGES
- 86.3 - ACTIVE INDUSTRIAL SITES
- 86.41 - QUARRIES



These rolling reliefs, facing the Adriatic sea, are well ventilated by periodic breezes and are characterized by eastward exposures and favourable climatic conditions

Thanks to these conditions a special program could be devoted to the choice of grapes variety: the Pecorino (a white wine IGT – “Indicazione Geografica Tipica”) is an old kind of grape, so called because the sheep (in italian “pecora”) were used to eat it, during the transhumance; another version refers to the shape of the sheep’s muzzle.

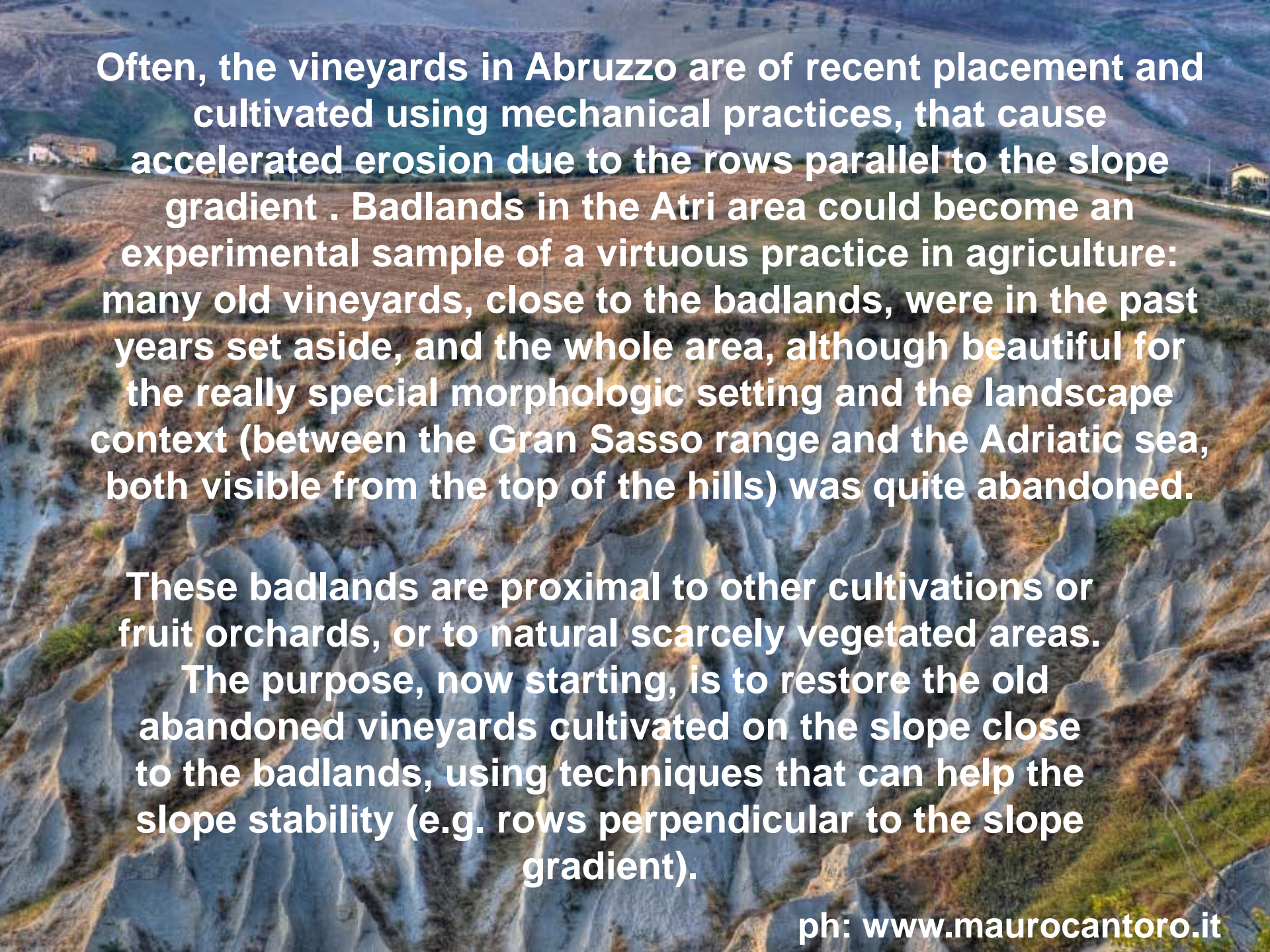
**The geo-environmental components show the coexistence of farming and vineyards on morphologies of sloping hills. The regularity of this type of landscape is broken by badlands, in some cases very close to the areas under cultivation.**

**The opposite slopes of the same relief as two faces of one reality: cultivation vs. badlands, representing the binomial risk/resource. The spectacular scene of the land forms, so dramatic in the eastside hilly landscape settings, becomes a potential resource by a touristic point of view**



**Ph: A. De Ascentis;**

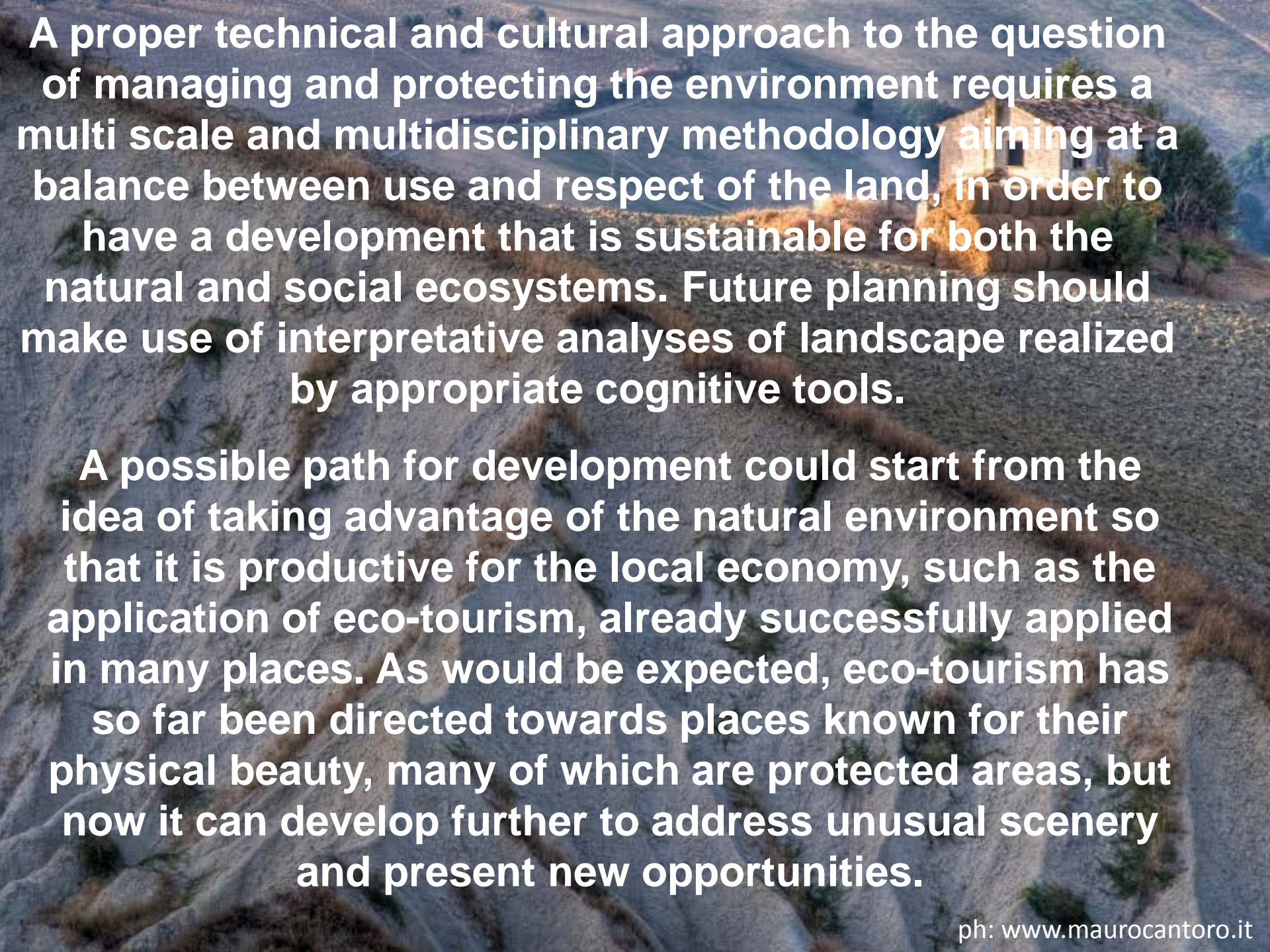
**This kind of situation is not easy to manage: it needs a lot of scientific/geomorphologic monitoring actions, new purposes in agricultural practices, social consensus, based on a shared knowledge and a common identification in the local landscape.**



Often, the vineyards in Abruzzo are of recent placement and cultivated using mechanical practices, that cause accelerated erosion due to the rows parallel to the slope gradient . Badlands in the Atri area could become an experimental sample of a virtuous practice in agriculture: many old vineyards, close to the badlands, were in the past years set aside, and the whole area, although beautiful for the really special morphologic setting and the landscape context (between the Gran Sasso range and the Adriatic sea, both visible from the top of the hills) was quite abandoned.

These badlands are proximal to other cultivations or fruit orchards, or to natural scarcely vegetated areas.

The purpose, now starting, is to restore the old abandoned vineyards cultivated on the slope close to the badlands, using techniques that can help the slope stability (e.g. rows perpendicular to the slope gradient).

A scenic landscape featuring a small, rustic stone building with a tiled roof situated on a hillside. The building is surrounded by sparse vegetation and trees. In the background, there are rolling hills and a clear sky. The overall scene is peaceful and natural.

**A proper technical and cultural approach to the question of managing and protecting the environment requires a multi scale and multidisciplinary methodology aiming at a balance between use and respect of the land, in order to have a development that is sustainable for both the natural and social ecosystems. Future planning should make use of interpretative analyses of landscape realized by appropriate cognitive tools.**

**A possible path for development could start from the idea of taking advantage of the natural environment so that it is productive for the local economy, such as the application of eco-tourism, already successfully applied in many places. As would be expected, eco-tourism has so far been directed towards places known for their physical beauty, many of which are protected areas, but now it can develop further to address unusual scenery and present new opportunities.**



**Thank you for your  
attention**

A large group of cyclists in colorful jerseys is lined up on a road, stretching across the width of the image. In the foreground, there is a vineyard with many white wooden stakes supporting the grapevines. The background is a lush green field.

**ACKNOWLEDGEMENTS**

**We are grateful to N. Luger for the GIS images; RCS Sport, Mauro Cantoro for the pictures and to A. De Ascentiis and F.Galluzzo for the valuable suggestions.**