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## Complex-matrix agricultural landscapes

*Patrizia F. Chirico, Francesca Finotto*

These are agricultural landscapes characterised by the copresence of various cultures (vines, olives, vegetables, aromatic herbs, permanent grassland, flowers), which give rise to a heterogeneous and irregular pattern. From the ecological functioning point of view, the arboreal cultures constitute intermediate elements between the more specialised cultivations and the natural vegetation and may hence partially make up for the lack of the latter, representing not negligible biodiversity resources. In addition, these cultures configure fragmentation spaces within the landscape matrix able to guarantee a minimum level of environmental connection.

### *Arboreous-culture agricultural landscapes*

These are agricultural landscapes where, in order, olive groves, orchards and frond cultures are predominant. Their agricultural management is quite heterogeneous. Farms experimenting with organic or integrated farming systems and farms operating using traditional techniques work alongside each other.

This type of landscape is localized prevalently on the innermost and best exposed mountain slopes. Here the cultivated land is patterned in stone terraces according to old farming methods, and the century-old search for a compromise between the physical reality of the territory and human needs is evident in their shapes.

From the ecological point of view, these landscapes constitute biologically complex and diversified agrosystems with a sizeable amount of stable biomass which helps preserve the biodiversity and also performs a significant ecological connection function. They may be considered secondary habitats which, although regulated by the human activity, have preserved part of the characteristics of the original ecosystem and allow many species to survive.

### *Wine-growing landscapes*

These are small-scale landscapes characterised by the dominating presence of vineyards and are mostly concentrated in the traditional wine-growing areas.

The wine-growing farms that play a leading role in these landscapes are well-structured and characterised by a high level of specialisation. Wine-growing is in fact a quite profitable activity, and obtaining the Dop [denomination of protected origin] marking for some common grapes (Pigato, Rossese, Vermentino) in the area has played a fundamental role in its development.

From the ecological point of view, functionality of this type of landscape is similar to that of the arboreous-culture landscapes.

### *Ecological structure of the territory of Albenga*

The analyses conducted have allowed understanding

the primary ecological structure of the territory. It consists of the corridor of the Centa river and its tributaries which connect the plain to the woodland matrix of the Apennine mountain slopes.

Grafted onto these elements is the aggregate of the arboreous-culture, wine-growing and complex-matrix agricultural landscapes which represent the areas on which to base the construction of a secondary ecological structure aimed at strengthening the primary structure. Interrupting the continuity of this system is the twisting road network which has favoured the formation of a capillary conurbation that frustrates the energy exchanges between the more natural ecosystems. The impact of this conurbation is amplified by the vast specialised agricultural landscapes across the network.

### *Improvement of the environmental system: strategies and project guidelines*

In order to enhance the stability of the environmental system of the territory of Albenga, some strategies have been defined, mainly aimed at the agricultural landscape, whose implementation requires examination on a detailed scale. In line with the current European Community policies, these strategies derive from the awareness that the agricultural space may play a leading role in improving the quality of the environmental system. The framework to outline the strategies has been completed by a series of project guidelines that pertain to specific types of landscape components.

### *Strategies*

In relation to the types of agricultural landscape identified, six strategies have been identified, which respond to the need to protect, connote, diversify, connect, compensate and refunctionalize. The protection and refunctionalization strategies refer to the arboreous and wine-growing cultures where the ecological and historical-identity dimensions coexist. The connection, diversification and connotation strategies guide the requalification of some strategically localized and specialised agricultural areas whose rethinking should allow establishing new guidelines for ecological connection. Finally, the compensation strategy is aimed at the specialised agricultural areas bordering on the main settlements, where the need to construct a protection system to compensate for the impact would appear more urgent.

Below is a brief description of each strategy.

**Protect:** this strategy aims at safeguarding and enhancing as much the natural components that regulate ecosystem functioning of an agricultural landscape as those that are the legacy of cultural processes, irrespective of their actual state of conservation.

**Connote:** connotation must be understood as the possibility of attributing recognisable and meaningful features to the landscape pattern. This is especially necessary in the agricultural areas that interface with the urban fabrics, where rearrangement and improvement of the space articulation should be pursued in order to esta-

publish an immediate perceptive readability.

**Diversify:** this strategy needs to invest as much in the individual components of a landscape as in their relations, their aggregation models, their functions, or the way they can be managed. In particular, differentiation of the prevalent functions to be attributed to the various sectors of the agricultural territory constitutes the fundamental step to orient and organise proper introduction of new components and new management procedures.

**Connect:** connection means healing the complex web of the networks (ecological, historical-cultural, visual and fruitive) that innervate a territory to make them synergically interact. In fact, the stability and effective quality of the landscape can only spring from their real interaction.

**Compensate:** this strategy responds to the need to resolve situations of imbalance caused by irremovable elements of criticality. There are two possible compensation levels: one acts on biological functioning of the environmental system and the other intervenes on the perceptive aspects, mitigating conditions of morphological conflict.

**Refunctionalize:** refunctionalization means reinterpreting the signs and components of the landscape to turn them over to contemporaneity with a renewed function also aimed at redefining the identity of the places.

#### *Project guidelines*

The project guidelines identified refer to precise types of landscape components and are aimed at enhancing the overall stability of the environmental system. They pursue three general objectives: containing the anthropic pressure, introducing ecosystem-landscape rebalancing elements and converting areas with a strong anthropic impact into paranatural neo-ecosystems.

More in detail, the Albenga project contemplates: renaturalization of intercluded areas, requalification of sections of river corridors and channelled brooks and conservation of the permeable passageways necessary to assure connectivity of the landscape mosaic.

#### *Ecological analysis in the strategic environmental assessment process of the plan*

The proposed project guidelines, given the almost exclusively private properties in the territory, configure scenarios difficult to implement, which require activation of widespread participatory processes activated by involving all the parties holding an interest. During the course of plan approval, the landscape services assigned to the territory should be planned in detail; for the moment, these services act as resources for Strategic environmental assessment (Sea) of the plan.

According to the provisions of the European and national regulations, Sea must configure an integrated knowledge path which, acting right from the first phases of formulation of the plan, accompanies the entire formation and implementation process.

In line with this orientation, the analyses conducted have contributed to strengthening the decision-making

process underlying the plan, assuring better integration between ecological-environmental system protection and enhancement strategies and settlement system development strategies. These analyses have furnished a set of data useful to construct the cognitive framework in which to orient the plan choices as well as to assess and monitor its environmental effects.

More in detail, the strategies and the guidelines hypothesized have contributed to defining the system of environmental quality objectives, which constitutes the strategic framework according to which the Sea process was formulated, and they were also used as reference to choose the most sustainable among the various alternatives. Conversely, the indexes used in the ecological analysis are merged in the set of indicators developed to assess the plan from its drafting stage through to monitoring.

In conclusion, the analyses conducted by indepth examination of one specific dimension of sustainability (ecological-environmental) contribute to enriching the interdisciplinary knowledge base underlying the plan and aid unitary and integrated management of the planning and strategic environmental assessment processes.