

Landscape Ecology applied to the planning and reclamation of a quarry in the territory of Bessa (Province of Biella - Italy)

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The present research starts from the hypothesis to open a gravel-pit in a site adjacent to the **Natural Special Reserve of Bessa**, in the commune of Cerrione (Province of Biella - I). The site, besides, presents a vocation to become a green area of access to the Reserve.

In the *first part* of this thesis, they are expounded some essential concepts about Landscape Ecology, discipline that gives innovative methods for the analysis of landscapes, considered as systems of ecosystems.

Particularly, the attention is placed on the application of **Landscape Ecology indices**, as indispensable instrument for data acquisition about landscape, in order to plan correctly a territorial transformation: it's possible identify, quantitatively and qualitatively: landscape dynamics, deteriorated elements and resources, more stable elements and more delicate ones.

The *second part* deals with the **analysis and diagnosis of the considered landscape**, through:

- analysis of morphology, soil use, Eco-tissue characters,
- the application of control indices, about functions:
 - **Biological Territorial Capacity (BTC)** (Mcal/mq/year)
 - **Belonging to Functional Apparatus** (%)

and about structure:

- **Human Habitat and Natural Habitat** (%)
- **Heterogeneity**
- **Average Grain of Territory** (ha)
- **Biotope Percolation**

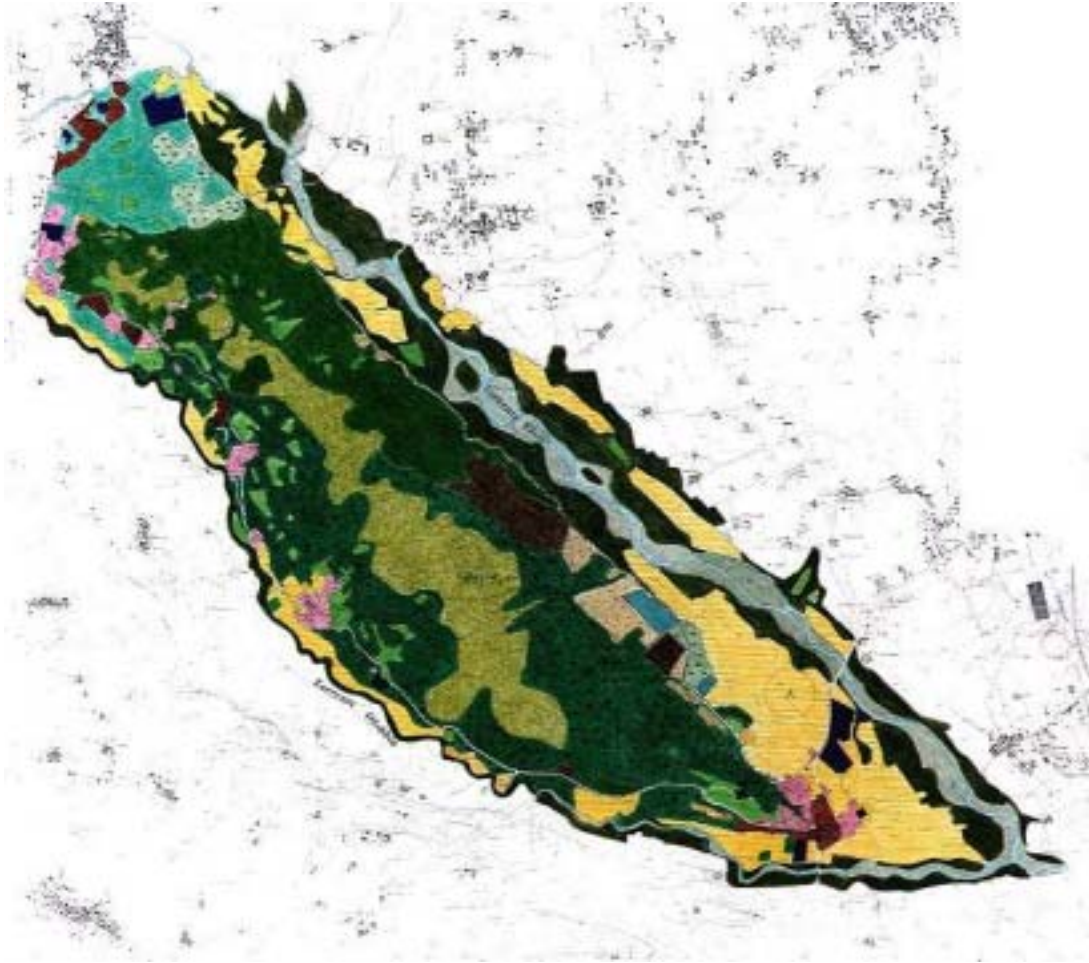


Fig.1 : Examined area: Soil Use and Vegetation

The *third part* deals with the plan of quarrying and its reclamation: the landscape analysis, carried out at different levels and scales, allows to identify some guide lines for a planning attentive to the existing ecosystems. It is demonstrated how the opening of a quarry, reclaiming also some adjacent deteriorated sites, can become a chance to create a **naturalistic oasis**, that answers to ecological demands of enviromental improvement and social necessity of recreational and didactic spaces.

We try to understand what effects a quarry may bring in the examined area and how it can be reclaimed, considering that a quarry reclamation may become also a way to create landscape resources, how it is happening in some disused quarries, where damp zones of great enviromental value have been generated.



Fig.2: Examined area: sheet of water in disused quarry, with natural recolonization.

The purpose is to improve the site from the ecological point of view, with reforestations, protection strip, ecological corridors, microhabitats for fauna; from the recreational point of view, with the introduction of sporting activity; from the didactic and storic point of view for the presence of natural laboratories for the study of ecosystems and the presence of a didactic-museum centre relevant to the naturalistic and archaeological aspects of the territory.

The data relevant to the **structure** (configuration of landscape elements) and to the **functions** (belonging to apparatus) are studied, analysed and quantified at different space-temporal scales, in order to value the disturbance of anthropic activity to the surrounding landscape, in a determinate arc of time. Considerations about dynamics happening in the eco-mosaic have been deduced and a functional model for the landscape arrangement has been purposed.



Fig. 3: Examined area: Reclamation plan

The plan offers the possibility to look into the territory of Bessa, from the point of view of environmental quality, valuable through the application of control indices, that could be used for **possible future projects** of landscape transformation, interesting, directly or indirectly, the area of Bessa.

Plates list:

Landscape:

- Morphology, Soil Use

Examined Area:

- Superior level: Morphology, Soil Use and Vegetation
- Biotope percolation
- Interesting level: Eco-tissue characters
- Inferior level: present situation; quarry plan; reclamation plan
- Sections and particulars
- Plannig verify

About control indices in Province of Biella, see also the Thesis of Andrea Garrione (feb.'98) and Paola Romano (feb.'98).