An integrated methodology for rural landscape economic valuation to support land use policies

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Outline

- Preliminary remarks
- Final objective of the research and its novelty
- The general framework
- The GIS-based analysis of the case study area landscape
- Individuals' preferences analysis
- Conclusive remarks
With the establishment of the sustainability framework during the 1990s, sciences are asked to propose methodologies to make sustainability principles applicable to planning and management, transgressing each others disciplines borders.
More effort is needed to developing transdisciplinary tools to evaluate landscape. It means to build ‘closer to the centre of the triangle’ *, away from a purely ecological approach to a more anthropocentric one.

* Potschin and Haines-Young (2006)
“Landscape is what and how people perceive it”
(European Convention of Landscape - Council of Europe 2000)

Any landscape analysis procedure has to be based on the consideration of the “objective” and “subjective” component forming the complex value and meaning of the landscape.
Aim of the proposed methodology is to estimate an economic value for rural landscape closer to its real social value and that might represent a reliable reference for incentives design.
Final objective of the research

Main peculiarities:

✓ “subjective” and “objective” components (holistic approach)

✓ different analytical tools (interdisciplinarity)

✓ definition and meaning of landscape – classification and management of landscapes (European Convention of Landscape)
The novelty of the research

- Classification and representation of the different landscape types in the economic models
- Use of landscape metrics as quantitative variables for landscape attributes
- Adoption of an explicit spatial analysis to link individuals' preferences to landscape attributes
The general framework

GIS environment

Landscape ecology
(GIS-based analysis & FRAGSTATS-based calculation of metrics)

Individuals' preferences analysis
(choice experiments for economic value estimate)

holistic approach to landscape analysis
1. Definition of landscape

- what we mean by landscape
- borders (maps) and objectives (rural settlements)
GIS-based analysis

Study case area:
Peninsula of Sorrento in the South of Italy
The new classification method * is based on a combination of holistic and parametric approach to obtain the “types” of landscape characterising the Peninsula.

### 2. Maps and data collection

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<thead>
<tr>
<th>Thematic map</th>
<th>Projected coordinate system</th>
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3. Landscape classification...

### Basic datasets
- Land cover Campania 2004
- Digital Elevation Model
- Orthophotos 1998

### Informative layers
- Land uses
- Altitude, land form, inclination, orientation
- Housing density

**Differentiating variables – Descriptive variables**

1465 cells x 32 differentiating variables
GIS-based analysis 6/8

... Landscape classification

1465 cells X 32 variables

Factor analysis + Cluster analysis → Homogeneous groups of cells (“types”)

✓ Different clustering procedures
✓ Specific pattern for the landscape types
✓ Final classification reflecting the situation on the ground
What's next

Extraction from the ortophotos of the informative layer “housing density” with eCognition

Composition and configuration metrics at cell and type level with FRAGSTATS

Integration of the descriptive variables from the left informative layers for the complete description of the landscape types

Selection and mapping of representative views for each type and within each type for each “subtype” for photographs
Selection of metrics

- Metrics are quantitative indices describing the spatial structure of landscape at a set point in time
- Caution in their use is advised (calculation and selection)
- Some authors (Dramstad et al., 2004; Palmer, 2006) prove the existence of relationships between some metrics (scenic value) and individuals' preferences
Individuals' preference analysis 1/2

Classification

Typical

Attributes/ Level of attributes

Metrics

Economic model

Individuals' preferences

WTP
Some issues:

- Valuation of the single types and not of the landscape as a whole
- Urban sprawl and farm abandonment as threats to rural landscape
- Revealed preferences method vs. Stated preferences method
Economic valuation of landscape cannot ignore landscape spatial dimension (physical, biological, natural entity, then economic resource)
Interesting results:

- first application of this new classification method to a Mediterranean landscape and in a economic valuation framework

- example of actual interdisciplinarity, with different disciplines integrating for a common research goal