

LANDSCAPE AND SETTLEMENTS. HISTORIC CENTER QUALITATIVE AND QUANTITATIVE VALUATION¹

Cinzia Fragomeni

Mariangela Musolino

Domenico Enrico Massimo

Antonino Barbalace

University of Reggio Calabria

Abstract. *One aim of the research is to mitigate the severe lack of scientific structural qualitative and quantitative knowledge and systemic ancillary information regarding Landscape Elements and Historic Centers of the Country. Methodology has been set up to build-up total and complete knowledge, almost definitive, of landscape Historic Centers resources and settlement. It might give possibilities to foster-up preservation, conservation, treasuring, indirect use, of the patrimonies at different geographic levels, increasing the national welfare.*

Keywords: *1. Multi criteria valuation. 2. Valuation system 3. Historic Centers. 4. Characteristics knowledge. 5 Landscape Elements. 6. Geographic information system.*

Introduction

Background debate concerning the future of national and world landscape, historic settlements as well as protected areas (such as Grand Canyon) enlists at least two opposite alternative positions: -preservation (oriented to collective consumption) as a mean to promote collective treasuring and enjoyment through indirect use (not private consumption), such as ecological tourism including healthy trekking, and prevent the individual uncontrolled privatization and embezzlement of *paysage* and related soil consumption and damages; -utilitarian direct use of *paysage* (orientated towards individual consumption) aiming to promote new development in order to generate indirect revenues for local and regional economies through taxation and therefore temporarily helping to avoid recession and unemployment, but at the same time destroying the intrinsic essential characteristics of the landscape itself. Since 1985 the Italian legislation (so called “Galasso Law”) has fostered-up a comprehensive landscape planning at the national level regarding the preservation, sustainable collective use of *paysage*. Landscape plans (so called: “Piani Paesaggistici Regionali”, *i.e.*, “Regional Landscape Plans”), run by regional Governments, should have identified, singled out, and enlisted all the *Paysage Units* (sub regional areas called: “Unità di Paesaggio”, UDP) of the Country, making decision concerning the degree of

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their collective preservation and enjoyment vs. individual use, embezzlement, and privatization for development and constructions purposes. It also detected, inventoried, and indexed all landscape individual resources and entities within the boundary of each *Paysage* Units, assessing and scoring the intensity of embodied landscape intrinsic values. Manmade cultural goods such as the Historic Centers (*i.e.* the original settlement) are included among the landscape resources. Today, these in-land Historic Centers are either mainly abandoned or kept in inappropriate conditions for the lack of knowledge, retrofit guidelines, and re-use ideas. The main obstacle to Historic Centers collective treasuring is the persistent lack of: 01.scientific qualitative knowledge of their structural and peculiar characteristics and elements; 02.ancillary data and information about what, where, and how many the Historic Centers are; 03.coherence and homogeneity of ancillary data among different Districts, Provinces, and Regions of the Country; 04.topographic information about where their original boundaries at key ages are: 1870; 1954. One objective of the research is to mitigate this lack of scientific genetic qualitative knowledge and systemic information about Italian Historic Centres, focusing on specific Regions, Provinces, and Districts, to test both the philosophy and operative methodology proposed in the present research. Producing ancillary data (on an experimental field) as well as a qualitative hermeneutic interpretation (on a philosophical perspective) might foster up an innovative contribution: a total, coordinated and complete knowledge of landscape resources and namely the subtotal of the Historic Centers, existing in a modular area within a: Town; District; Province; Region. Total and complete knowledge of resources might give possibilities and opportunities to: -unify and coordinate all existing sparse and uncoordinated datasets in a whole coherent information system; -help (thanks to systemic information, individuals, associations, civil society, Institutions (namely Historic and Landscape Preservation State Authorities: central Ministry; Regional Directorates; Superintendents)) to preserve and treasure landscape values, resources, goods, elements; -support the Regional Planning Authority (in institutional cooperation with Historic and Landscape Preservation State Authorities at the central, regional, and provincial levels) to layout and enforce the Regional Landscape Plan; -in so doing, avoid the destruction of further *paysage*, historic settlements, and landscape values, because of further construction. In treasuring all Landscape Elements at the Regional, Provincial, and District levels a specific category of resources such as Historic Centers has a special relevance because might be the back bone of logistics in organizing sustainable enjoyment of Landscape Intrinsic Indirect Values (not utilitarian) such as: Aesthetic; Wildlife; historical Geo - botanic; Recreation; Eco-tourism; Education; Existence; Science; Ecological capital; Ecological process; Ecological benchmarks. With regard to the landscape and cultural heritage as a whole and its individual elements, "categorizing the intrinsic indirect values can enable systematic elucidation" and disentanglement of their: - features; -characteristics; -genetic components; -structural composition. The

grasping and knowledge of genetic components of *paysage* elements helps: - philosophical detection of its structural aspects through index tools; - qualitative valuation and ranking of each single aspect in its specific categories; - preservation; - conservation; - treasuring; - enjoyment.

Aim of the research is therefore to set an almost definitive information system for Historic Centers, as a one special intended original man settlement in the original natural land: - structural knowledge; - quantitative census; - qualitative multidimensional valuation; - remote data diffusion on the Web.

It is possible, for each Historic Center, to plan ahead, design, and manage the levels of their: - preservation; - conservation; - collective non-consumptive use and enjoyment; - private direct use and individual appropriation.

A Case Study is implemented to detect and analyze all the settlements of the large area of a Province (Reggio Calabria), and then to experiment and test the philosophy and methodology proposed in the research.

The almost definitive information system for Historic Centers relies upon the following four pillars that allow a total management of the settlement network.

1. **HeritKnow**. Step #1: KNOWledge of urban HERITage.
2. **HeritUs**. Step #2: Total inventory or censUS of urban HERITage.
3. **HeritVal**. Step #3: Quality VALuation SYSTEM of urban HERITage.
4. **HeritWeb**. Step #4: WEBGis of urban HERITage.

1. HeritKnow

Step #1. KNOWledge of urban HERITage. Based on selected genetic characteristic (criteria) checking and scoring

According to the basics of scientific epistemology, entities of interest (Landscape Elements; Historic Centers) to be analyzed are knowledgeable “by heart”, *i.e.* by a synthetic and informal intuition. An entity can also be known in more formalized terms if it is analyzed and investigated “as a bundle of characteristics”. Each characteristic of them can be expressed and qualified by the use of parallel correspondent criteria. Innovation in the present research is that: genetic features or characteristics are also adapted and adopted as criteria to assess center comparative quality; and it can be scored with valuation practice and utilizing approaches such as Multi Criteria Analysis (MCA). To know more and value Historic Centers at hands, some features \ characteristics \ criteria have been tested in pioneer specific experiences of urban analysis and MCA valuation (Nijkamp, 1988; Fusco Girard, 1992; Massimo, 1995, 1997, 1998, 2002, 2005; Fusco Girard, Nijkamp, 1997; Massimo, Vescio, 2000). Further innovation in the present research, with respect to others (Massimo, 2006), is the increased number of adopted genetic characteristics or valuation criteria. These have been increased from 12 to 14, making more sense and transforming the valuation in a more demanding and complex procedure. Therefore, genetic features \ characteristics of historic centers and corresponding criteria used in the present re-

search are 14 and articulated in four scenarios: A. settlement; B. urban; C. architectural; D. cultural \ tourist. It follows a short description of all criteria.

FEATURES \ CHARACTERISTICS AND CRITERIA

A. SETTLEMENT FRAMEWORK

01 A.1 Geographic location and accessibility in the province

Geographic location in the spatial and infrastructural provincial framework. Level of territorial and street accessibility. **Higher** scores are assigned to better position and accessibility.

02 A.2. Good location and orientation-exposition in the territory

Positive and harmonic relationship between site and overall building and town construction, aesthetic landscape outcome of global construction or “cityscape”, and orientation-exposition. Better territorial location and orientation-exposition, **Higher** scores are assigned.

03 A.3. Perceived quantitative Historic Center consistency

Quantitative consistency of the Historic Center in terms of perceived physical extension. It makes possible the reasonable comparability between center too different for typology and dimension. **Higher** scores are assigned to larger center.

B. URBAN QUALITY

04 B.1. Urban qualities. Preservation and persistency of original characteristics

Harmonic relationship between streets, squares, buildings, and symbolic elements of analyzed center. More harmonic spatial proportions among urban elements, **higher** scores are assigned.

05 B.2. Dimension and ramification of urban streets

Width, articulation and organicity of urban streets. **Higher** scores are assigned to streets wide, numerous and in harmonic relationship with urban blocks.

06 B.3. Dimension of urban blocks

Original and present length and width of urban blocks and relation among all blocks, with special positive attention to smaller dimensions. Width of streets in between blocks, better larger than minimum. Smaller or more proportional blocks, **higher** scores are assigned.

C. ARCHITECTURAL QUALITY

07 C.1. Construction or building technical characteristics

Building original system: materials; techniques; technologies. Valuation of: original constructive quality; classification of elements; link to provenance site \ locality. More physical quality \ solidity and larger permanence of original materials, **higher** scores are assigned.

08 C.2. Original architectural characteristics or integrity

Architectural, aesthetic and linguistic features and their permanence and integrity in all buildings, or alterations \ modifications operated by men over time. Score are proportional to aesthetic and architectural integrity and quality. More quality, **higher** scores are assigned.

09 C.3. Fronts

Building fronts on public spaces such as streets, squares, vistas, belvederes. Bi-dimensional element of urban scenery. Their elements are: proportions; specific aesthetic; shape; materials; colors. Better quality and integration with front spaces,

than **higher** scores are assigned.

10 C.4. Urban spaces and squares

Quality and quantity of urban squares and collective spaces which foster-up meetings and call together people. Better quality, **higher** scores are assigned.

D. CULTURAL \ TOURIST ATTRACTIVENESS

11 D.1. Landscape attractiveness of the historic center

Potential environment and landscape attractiveness and evocativeness of the historic center. Higher landscape attractiveness, **higher** scores are assigned.

12 D.2. Urban attractiveness of the historic center

Attractiveness of historic urban pattern or new plantation scheme \ drawing. More attractiveness, **higher** scores are assigned.

13 D.3. Relevance or extraordinariness of monuments inside center or monumental characters of the historic center

Building rarity, art objects having artistic features, historical interests, or demographical importance recognized by: people feelings; or\and experts' opinions; or\and landmark official register or\and roster; or\and scientific publications. Higher relevance, **higher** score.

14 D.4. Monuments inside historic center

Number, density and level of building having artistic features and historical interests, recognized by: people feelings; or \ and experts' opinions; or\and landmark official register or\and roster; or\and scientific publications. Higher the number of monuments, **higher** score.

2. Heritus

Step #2. Total inventory or censUS of urban HERITage, based on historical data and maps

Cornerstones of landscape preservation, Historic Centers conservation and cultural treasuring actions should be, first of all, a comprehensive detection and inventory of all entities through discovering, description, classification, registration, and, this is new, valuation. The goal is to create an "exhaustive, topographical and thematic inventory" of all the entities as recommended by the Council of Europe (Council of Europe, 2001). It is here named Total Inventory or Total censUS of HERITage or "heritus". It is an updated technique that leads to systematic knowledge and numeric assessment of Landscape Elements, namely the category of Historic Centers, behind and above the roster in the State National Register of enlisted entities or properties and the known and published tourist guide (Massimo, 2006). Relevant difference between official roster and "heritus" is that the former enlists only the registered masterpieces, instead the latter attempts to detect and quantify through hard desk work all relevant Landscape Elements and original settlements existing and localized in the territory. The technical bases for the total census and account a large number of unpublished (sometime unknown) historical maps and historical population censuses. In particular, among the many available historical maps discovered from abandoned archives, detected, scanned, and georeferenced on GIS, Historic Centers have

scientifically been detected thanks to the map called “Carta Generale del Regno delle Due Sicilie” published in 1829 - 1831 and in second edition in 1852.

3. Heritval

Step #3. **Quality VALuation of urban HERITage, based on multi-dimensional assessment of characteristics**

It is possible to perform qualitative valuation of Historic Centers in a consolidated framework of well-established discipline of Landscape and Cultural Heritage Appraisal founded by Forte in 1977 and strongly fostered by ICOMOS in 1981 (Forte, 1977; ICOMOS, 1981; Liechfield, 1981; Nijkamp, 1981; Fusco Girard, 1981; Therond, 1981; Mattia, 1983; Amata *et alii*, 1991). The novelty, in recent years, is that quantitative and cardinal sub-discipline of Economics such as Quantitative Methods and Cultural Econometrics called-up to evaluate urban alternative programs, adopting unconventional approaches such as MCA for qualitative ordinal assessment of landscape ordinal elements and for their consequent hierarchical ranking (Torrise, sd). As experimented in several previous cited researches, specific typologies and generations of MCA approaches (Nijkamp, 1979; Hinloopen, Nijkamp, Rietveld, 1983) have been developed and experimented for the peculiar specific purpose (Massimo, 1991; Nijkamp, Finco, 1999). Inside sub-regional clusters of “districts”, a deep knowledge is required about each single Historic Center to understand genetic features and characteristics, related values, tourism potentialities, in a relative hierarchical form, and to grasp possible future re-uses and revitalization in a rank order. For each center, each valuator writes down a heuristic and intuitive assessment, *i.e.* a Report describing: 1. general intuitive value or quality; 2. special attractors; 3. effective level of conservation *vs.* (and) critical conditions; 4. intuitive potentialities for economic revitalization. Qualitative data have been processed to understand latent relationships and detect latent implicit variables, relying upon: robust ordinal qualitative statistics (Hinloopen, 1985; Hinloopen, Nijkamp, 1986); experimented methodology (Coccosis, Nijkamp, 1995; Fusco Girard, Nijkamp, 1997); specific Case Studies applied in the same region (Massimo, 1991, 1995, 1997, 2002, 2005, 2006; Massimo, Vescio, 2000). MCA process provides a rank order of evaluated Historic Centers.

4. Heritweb

Step #4. **WEBGis of urban HERITage, available for both consultation and remote valuation**

Understand by knowledge (“heritknow”), census (“heritus”), and analytical valuation (“heritval”) can be made available to potential users via Web, enlarging dramatically its service, diffusion, and efficacy. This capital of knowledge can be accessible by structuring an Internet service for both uses: consultation for

general public; appraisal and valuation support and performances for analysts, evaluators, and experts (Massimo, Barbalace, Mercuri, 2005). The subsequent step, after GIS building-up, is the transfiguration in a Web site accessible to analysts, evaluators, experts and other general users. Consequently: for remote use and fruition by general users “Hyper Atlas GIS of Historic Centers” will be transformed in WebGIS; and for appraisers will be transformed in a valuation GIS, *i.e.* General information System (GiS) for Valuation and Appraisal (EvA), or GiS.EvA, in Italian SGV.

5. Case study at large level of province territory

The hardest Case Study tries to answer the most demanding Institutional request: to detect, inventory, select, visit directly, score and rank the most prominent and highest potential Historic Centers of the whole province of Reggio Calabria. Key choice in this first and pioneer experiment is the subdivision of the province in sub-provincial areas called historic “districts”. The latter represent territories having cultural identity and geographic homogeneity. Ranking of centers belongs to separate districts and this gives a lot of sense to the interpretation of final results. Valuation has been performed for two sub-provincial historic districts, called: “Grecanica” and “Locride”. Given the high number of settlements in “Locride” district, from the list have been selected the pivotal villages called: “*capoluoghi di mandamento*”. Then, original settlements to be analyzed and valued, in the two historic districts, are: *Locride district*: 01.Ardore; 02.Caulonia; 03.Gerace; 04.Gioiosa; 05.Grotteria; 06.Locri; 07.Mammola; 08.Roccella; 09.San Luca; 10.Siderno; 11.Stilo. *Grecanica district*: 01.Bagaladi; 02.Bova; 03. Chorio; 04.Condofuri; 05.Fossato; 06.Gallicianò; 07.Melito; 08.Montebello; 09.Palizzi; 10.Pentidattilo; 11.Pietrapennata; 12.Roccaforte; 13.Roghudi; 14.San Lorenzo; 15.San Pantaleone; 16.Staiti. The demanding tour allowed both the scoring according to methodology, and a relevant innovation. It is the check by written report and picture documentation about the blight and decay of settlements and their architectures. This is the first documented monitoring act sub-sequent analytic and evaluative research. In this phase, an evaluation team, well trained, compiles the Quantitative Effect Matrix, *i.e.* the characteristics \ criteria scores as basis for ordinal statistics hierarchy assessment.

Table 1.

Calabria Region. "Locride" District. Multi Criteria Valuation of Historic Centers.

Expert panel. Qualitative Effect Matrix

N	Criteria Centres	01. A1	02. A2	03. A3	04. B1	05. B2	06. B3	07. C1	08. C2	09. C3	10. C4	11. D1	12. D2	13. D3	14. D4
01	Ardore	2	3	3	2	2	2	3	2	2	3	1	2	2	2
02	Caulonia	3	4	3	5	4	4	4	3	3	4	3	3	3	4
03	Gerace	3	5	5	5	5	5	5	4	5	5	4	4	5	5
04	Gioiosa	4	3	4	4	3	3	3	3	3	3	3	2	3	3
05	Grotteria	2	2	2	1	1	1	1	1	1	2	3	1	1	1
06	Locri	4	2	3	2	4	2	3	2	2	3	1	2	4	2
07	Mammola	4	4	4	3	3	3	4	3	3	2	3	2	3	3
08	Roccella	4	3	5	1	2	1	3	1	2	3	2	1	3	3
09	San Luca	1	2	2	1	1	1	2	1	1	2	2	1	3	1
10	Siderno	3	2	2	2	2	2	4	3	3	2	1	1	2	3
11	Stilo	2	4	3	4	3	4	5	4	4	3	3	2	5	5

Table 2.

Calabria Region. "Grecanica" District. Multi Criteria Valuation of Historic Centers.

Expert panel. Qualitative Effect Matrix

N	Criteria Centres	01. A1	02. A2	03. A3	04. B1	05. B2	06. B3	07. C1	08. C2	09. C3	10. C4	11. D1	12. D2	13. D3	14. D4
01	Bagaladi	3	2	3	2	3	2	2	2	2	4	2	2	3	3
02	Bova	3	4	4	4	4	4	4	3	3	3	3	4	4	5
03	Chorio	4	3	3	3	2	2	2	2	2	3	2	2	1	1
04	Condofuri	2	3	4	1	3	1	2	1	1	2	1	1	1	1
05	Fossato	2	2	4	1	3	3	2	1	1	2	1	2	2	2
06	Galliciano	3	4	1	3	3	2	4	3	3	4	5	4	4	2
07	Melito	5	4	5	3	3	2	2	2	1	2	2	3	2	4
08	Montebello	3	3	3	2	3	1	3	2	2	1	2	2	1	1
09	Palizzi	2	3	4	3	2	3	3	2	2	2	5	2	3	3
10	Pentidattilo	4	4	2	2	2	1	4	2	2	1	5	2	4	1
11	Pietrapennata	2	2	2	3	2	1	2	1	1	2	2	2	2	1
12	Roccaforte	1	3	2	3	2	2	2	2	2	1	2	2	1	1
13	Roghudi	1	3	1	3	2	2	2	3	2	2	4	3	1	1
14	San Lorenzo	3	2	4	3	3	2	3	2	2	5	2	3	3	3
15	San Pantaleone	3	2	3	1	2	1	2	2	2	2	1	1	1	1
16	Staiti	2	2	4	3	2	2	2	1	1	3	2	2	4	2

6. Running Multi Criteria Valuation through Dominant Regime Method

Software runs the autonomous Qualitative Effect Matrices, and the main unified Qualitative Effect Matrix. Outcome is the ranking of all Historic Centers according to scoring activity of Evaluator Panel articulated per district. The under covered process is managed by a Senior Evaluator Master or Coordinator that checks for coherence the first results of few initial runs, before the definitive

one. The personal skill of each Evaluator is improving because all of them are called up to write down, in secret mode, a personal heuristic final ranking of all the settlements they are going to score up in numerical expression. Afterwards, Senior Valuation Master or Coordinator promotes bilateral meetings with each Evaluator, commenting final analytical outcomes with heuristics, trying to understand differentials. Final results are in the following table and in the figures.

Table 3.

Valuation of Historic Centres in <i>Locride</i> and <i>Grecanica</i> districts											
<i>Locride</i> district				<i>Grecanica</i> district							
N	Historic Centers	Rank DRM	Score DRM	N	Historic Centers	Rank DRM	Score DRM	N	Historic Centers	Rank DRM	Score DRM
1	Ardore	9	0,263	1	Bagaladi	5	0,707	12	Roccaforte	12	0,195
2	Caulonia	3	0,848	2	Bova	1	1,000	13	Roghudi	7	0,550
3	Gerace	1	1,000	3	Chorio	14	0,154	14	San Lorenzo	6	0,596
4	Gioiosa	4	0,653	4	Condofuri	10	0,354	15	San Pantaleone	16	0,053
5	Grotteria	10	0,051	5	Fossato	11	0,288	16	Staiti	8	0,433
6	Locri	6	0,469	6	Gallicianò	3	0,875				
7	Mammola	5	0,648	7	Melito	15	0,058				
8	Roccella	7	0,353	8	Montebello	9	0,428				
9	San Luca	11	0,049	9	Palizzi	4	0,858				
10	Siderno	8	0,314	10	Pentidattilo	2	0,920				
11	Stilo	2	0,851	11	Pietrapennata	13	0,181				

7. Conclusion

One aim of the research is to mitigate the severe lack of scientific structural qualitative knowledge and systemic ancillary information concerning landscape. Research has set and tested an almost definitive information system for landscape complex system, starting from Historic Centers as a one special category intended as original men settlement in the original natural land. In fact, information is the key element to support landscape resource and Historic Center: - structural knowledge; -quantitative census; -qualitative multi-dimensional valuation; -remote data diffusion on the Web. Grasping and knowledge of genetic characteristics and components of *paysage* elements and of Historic Centres helps: -philosophical detection of its structural aspects through index tools; - qualitative valuation and ranking of each single aspect in its specific Categories through multidimensional valuation; -preservation, through Regional Landscape Plan and other specific tools; -conservation; -treasuring; -enjoyment. Valuation of landscape and original settlement elements is performed considering genetic features of resources as criteria for qualitative assessment of Intrinsic Existence Values as basis to derive a rigorous value ranking and therefore a corresponding degree of priority for: -planning; -protection; -intervention; -marketing of each entity within the double coordination of respective categories and space of sub regional "Landscape Unit". Research outcomes are the basis of systemic information that help individuals, associations, civil society, Institutions (namely Historic and Landscape Preservation State Authorities: central Ministry; Regional

Directorates; Superintendents) to preserve and treasure landscape values, resources, goods, elements, with an ordered, scientific and rigorous hierarchy and priority ranking. Research kept the promises by building a complete, almost definitive, knowledge framework and web information system giving a systemic set of tools for landscape integral treasuring.

Summary

One aim of the research is to mitigate the severe lack of scientific structural qualitative knowledge and systemic ancillary information concerning landscape complex system, starting from Historic Centers as one special category, intended as original men settlement in the original natural land. Research has set and tested an almost definitive information system, in fact, information is the key element to support landscape resources and Historic Center: -structural knowledge; -quantitative census; -qualitative multi-dimensional valuation; -remote data diffusion on the Web. Grasping and knowledge of genetic components of *paysage* elements and of Historic Centres helps: -philosophical detection of its structural aspects; -qualitative valuation and ranking through multi-dimensional valuation; - preservation, through Regional Landscape Plan; -conservation; -treasuring. Valuation of landscape and original settlement elements is performed considering genetic features of resources for qualitative assessment of Existence Values. Research outcomes are the basis of systemic information that help individuals, associations, civil society, Institutions to preserve and treasure landscape values, resources, goods, elements, with an ordered, scientific and rigorous hierarchy and priority ranking. Research kept the promises by building a complete knowledge framework and web information system giving a systemic set of tools for landscape integral treasuring.

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Figures

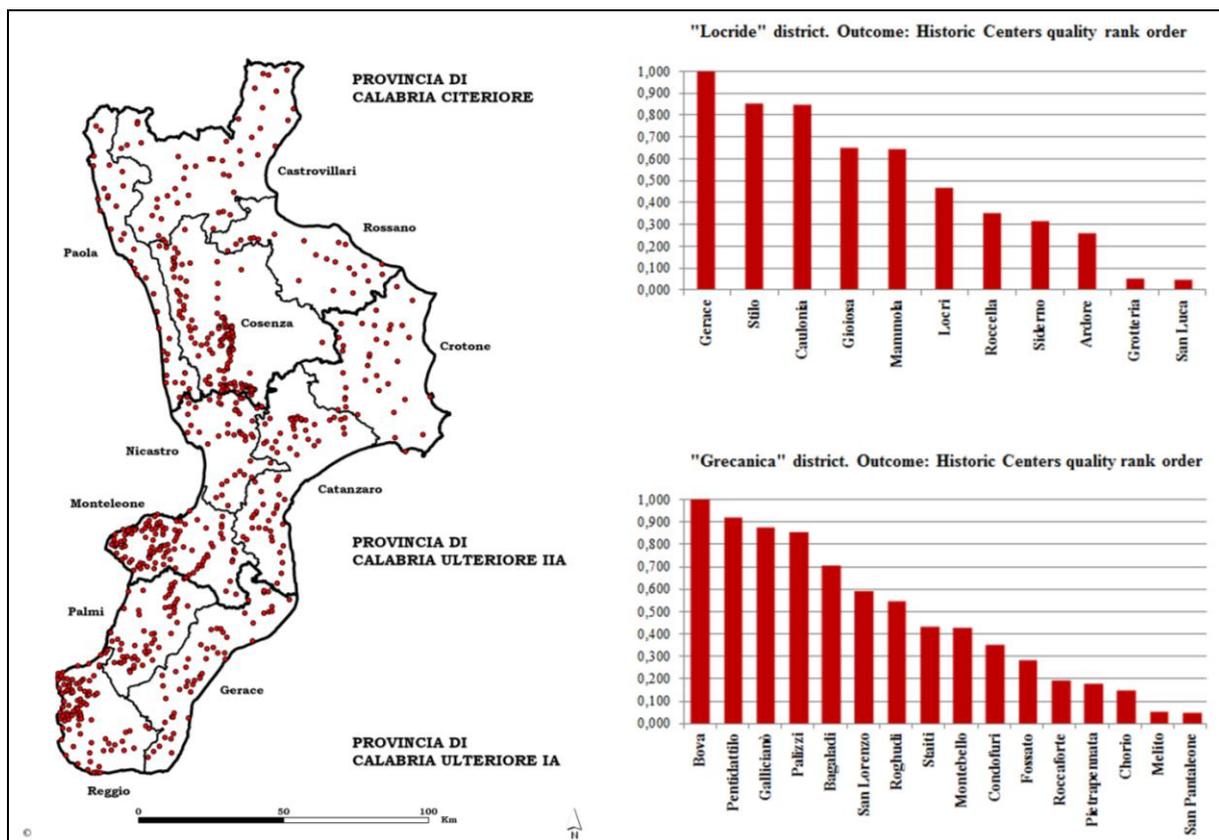


Figure 1. Calabria Region. Historical provinces and district. Detection of 694 centers at 1851. Quality rank order bar-graph. *Locride* and *Grecanica* Historic Centres.

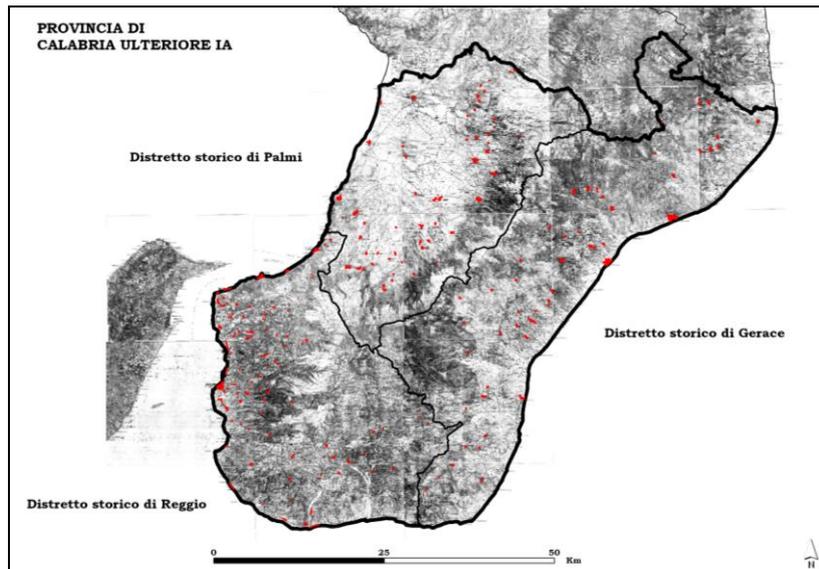


Figure 2. Calabria Region. Province of Reggio Calabria. Mark out of 202 centers at 1870. Basemap: topographic map at 1870

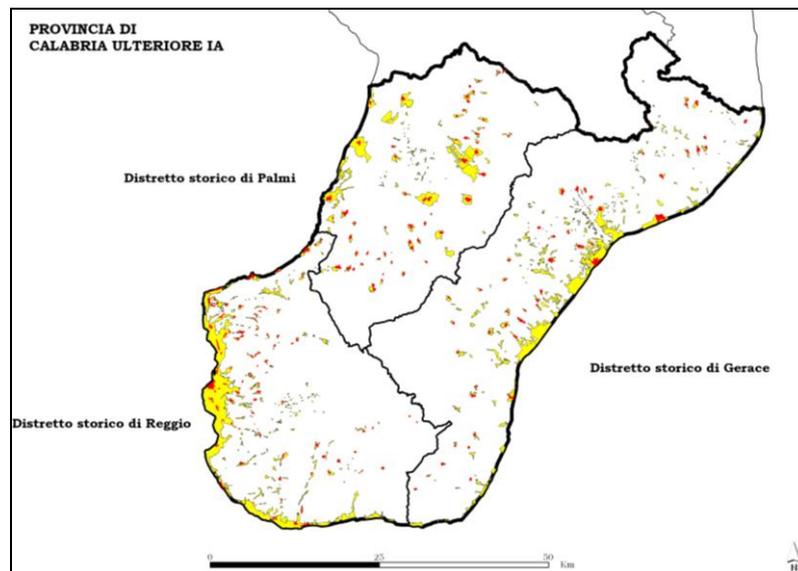


Figure 3. Calabria Region. Province of Reggio Calabria. Historic Centers overlapping at 1870 (red) and 2001 (yellow). Basemap: 1870 topographic map; 1991 census map

Cinzia Fragomeni	Department of PAU University of Reggio Calabria, Italy E-mail: paugis@libero.it
Mariangela Musolino	Department of PAU University of Reggio Calabria, Italy E-mail: mariangela.musolino@unirc.it
Domenico Enrico Massimo	Department of PAU University of Reggio Calabria, Italy E-mail: massimo@unirc.it
Antonino Barbalace	Department of PAU University of Reggio Calabria, Italy E-mail: barbalac@mit.edu

*Cinzia Fragomeni, Mariangela Musolino, Domenico Enrico Massimo, Antonino Barbalace.
Landscape and Settlements. Historic Center Qualitative and Quantitative Valuation*