

Historic Center Valuation in Landscape Planning. Interactive Geodatabase in Web GIS Platform

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Attribuzioni. D. E. MASSIMO ha impostato la ricerca e ha redatto i paragrafi: 1, 6, 7.
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Abstract

Landscape planning should have censused, described, taxonomized, classified the landscape units along with the degree of their use, according to their intrinsic natural values and among these the Historic Centers today suspended between total abandonment for anthropic desertification and heavy manumission given the lack of sustainable maintenance guidelines. Objective of the research is to design a first conceptual, methodological, operative and instrumental analysis to provide thorough information concerning the landscape-cultural protection in Italy, and in particular about Historic Centers. Research aims to propose a general framework that, with its flexibility and adaptability, might contribute to coordinate landscape planning as well Historic Center revitalization policies. Spill-over and impact of the research is the building-up of an unprecedented knowledge about historic settlements thanks to the design of an Interactive Database of Historic Centers on Web GIS (Geographic Information System) environment called Hyper Atlas of Historic Centers, comprising 4 main features: 1) Heritus; 2) Heritknow; 3) Heritval; 4) HeritWeb. Moreover, within the general framework, it has been tested a new Historic Center Index built by comparing over 10 institutional and scientific examples validating its usefulness and adaptability to other regions.

Riassunto

La pianificazione paesaggistica Italiana avrebbe dovuto censire, descrivere, tassonomizzare, classificare le unità di paesaggio e l'intensità della loro utilizzabilità, in rapporto ai valori naturalistici incorporati e tra questi l'importante struttura dei Centri Storici che sono oggi sospesi tra il totale abbandono per desertificazione antropica e la sostanziale manomissione per assenza di pur minime guide di manutenzione sostenibile. Obiettivo della ricerca è di elaborare una prima analisi concettuale, metodologica, operativa e strumentale per supportare una più approfondita informazione sulla tutela paesaggistico-culturale in Italia, e in particolare sui Centri Storici, proponendo un modulo che, nella sua flessibilità e adattabilità, possa contribuire al coordinamento dei dati sulla pianificazione paesaggistica e in particolare sull'insediamento consolidato. Oggetto della ricerca è: la creazione di un'inedita conoscenza dell'insediamento consolidato grazie alla progettazione di una Banca Dati Interattiva dei Centri Storici su piattaforma Web GIS, contenente 4 main features: 1) Heritus; 2) Heritknow; 3) Heritval; 4) HeritWeb. Inoltre all'interno del framework generale delineato, è stata sperimentata una prototipale Scheda Centro Storico elaborata comparando oltre 10 esempi di schede sia istituzionali, sia scientifiche. Il test ha validato l'utilità e la potenziale adattabilità ad altri contesti regionali.

1. Integration between Landscape Planning, New Sustainable Urbanism, and Green Building

The growing and dangerous urban sprawl phenomenon is consuming the agricultural, arable, forestry and open land, inexorably changing the natural as well as built-up landscape.

Planners, designers, entrepreneurs, organizations and governments are converging toward a “new landscape planning” characterized by the coordination \ integration between “environmental approach” (at landscape level), “new sustainable urbanism” (at urban level); “Green Building approach” (at building level). Paramount goals of this new approach should be, among others:

At landscape level

- design of unified strategies at national level for landscape protection, valuation, conservation, treasuring and enhancing comprising historic centers.

At urban level

- in case of existing historic centers: foster-up their revitalization *versus* further urban sprawl;
- in case of new settlements: design and construction of new neighborhoods or villages characterized by compact growth, mixed use, small urban blocks, pedestrian orientation, definite public squares.

In both cases, settlements should be connected and served by public green urban rail transport in order to enhance their structural accessibility, and in so doing, help to lower individual traffic by private car, reduce consequent congestion and mostly mitigate sprawl.

At building level

- in case of existing buildings: foster-up sustainable retrofitting according to Green Buildings approach *versus* replacement with totally new and energy demanding buildings;
- in case of new buildings: design and construction of small buildings with environmental orientation, ecological materials, high energy efficiency, self-production of energy by renewable sources.

Therefore, a general, coordinated, unified framework at Country level within landscape planning and Historic Center retrofitting and revitalization policies, supported by specific tools, is needed.

2. Research focus: Historic Center knowledge and valuation

In the peculiar and idiosyncratic Mediterranean Europe and Italian settlements, the strategy toward the “new sustainable urbanism” should be implemented setting up the priority of “Historic Center rehabilitation and up-grading” instead of additional urban spreading-out.

In particular, for what concerns the Historic Centers *i.e.* the concentrated focus of the specific study here presented (as a part of the general research concerning landscape planning, historic centers revitalization and policy responses to sprawl), there is a relevant difficulty in implementing the above strategic program: the almost total lack of knowledge and valuation about Historic Centers and their characteristics despite their world cultural relevance and tourism prominence.

In fact, in Italy a complete knowledge about Historic Centers does not exist yet, even if some attempts have been made in the past. A first list of Italian Historic Centers has been compiled between 1986-1990 relying upon a set of historic topographical maps. A second list has been compiled between 1990-1994, for seismic prevention purpose, relying upon Toponymy Database. A third list has been compiled in 1999 relying upon the zoning maps of urban plans: Historic Centers should be the areas named as such in planning drawings (Marconi *et alii*, 1999).

No complete and systematic Atlas compilation based on scientific methodology has been built-up and applied. So, questions still remain unanswered.

3. Historic Center: demand of systematic knowledge, valuation, web fruition

There is a strong demand for systematic knowledge and evaluation about Historic Center network, coming from planners and New Urbanism technicians, local and regional governments, economic development agencies and social councils, state and international institutions devoted to landscape treasuring and historic settlements conservation. Requests of information are specific and concern:

1. complete quantitative census and account of all Historic Centers existing and existed within a given geographic boundary;
2. quantification of their evolution in terms of m², population dynamics, number of inhabitants, eventual (or not) correlation with economic growth;
3. qualitative knowledge of each settlement, structured in characteristics and expressed through criteria for subsequent assessment;
4. related multi dimensional evaluation approaches which output is a qualitative hierarchy useful for decision, government, management, interventions, future researches;
5. Web use of all information for consultation by general public, visitors, tourists (hopefully) and remote valuation by valuers;
6. strong scientific and technical support to Institutions in their paramount and very difficult mission and task for unifying landscape planning in Italy.

Research and Case Studies here presented, has tried to set-up a systematic methodology by building-up an Interactive Database of Historic Center on Web GIS *i.e.* an Hyper Atlas of Historic Center, as a general framework finalized to their treasuring.

4. Interactive Database of Historic Center on Web GIS *i.e.* Hyper Atlas of Historic Centers

Research has tried to answer to the specific requests coming from institutions and social bodies by setting-up a comprehensive Interactive Database of Historic Center on Web GIS *i.e.* Hyper Atlas of Historic Centers. It allows to respond, for government and social purposes, to questions like: “how many are the Historic Centers in a defined geographic boundary?”; “what are their characteristics and potentialities?”; “how is the demographic trend in the last centuries?”; “is it possible to derive qualitative ranking of Historic Centers on the basis of selected criteria?”.

The Hyper Atlas, might represents a general support for spatial management and local government, and also a specific tool for the Historic Center knowledge and revitalization.

The general framework tool (helping Historic Center cultural-sustainable conservation and treasuring) provided by the research with the “Hyper Atlas of Historic Centers” relies upon (among many other sources of information): historic cartography; pioneer censuses; valuation of characteristics; Web fruition. In particular, it is based upon census, knowledge criteria, valuation, communication, *i.e.* upon four specialized approaches below described: “heritus”, “heritknow”, “heritval”, “heritweb”.

N	NAME	HYPER ATLAS OF HISTORIC CENTERS. INFORMATION LAYERS
1	Heritus	Total inventory or censUS of urban HERITage, based on historic data and maps
2	Heritknow	KNOWledge of urban HERITage, based on selected characteristic (criteria) checking and scoring
3	Heritval	Quality VALuation of urban HERITage, based on multi dimensional assessment of characteristics
4	HeritWeb	WEBGis of urban HERITage, available for both consultation and remote evaluation

Table 1 – Interactive Database on Web GIS i.e. Hyper Atlas of Historic Centers. Structure.

The above framework is an innovation in coordinating several disciplines and different data sources.

Case Studies application gives the opportunity to test, validate, correct and ameliorate the theoretical and methodological framework.

5. Case Study

The system has been tested on all the Historic Centers located in the Case Study area *i.e.* Calabria region: from first detection, and inventory on scientific basis; to analysis concerning objective characteristics of each center; to single out of boundaries of historic settlement derived from analyses of georeferenced historic military maps; to population dynamics discovered in the archives; to state-of-the-art qualitative and ordinal valuation of Historic Center characteristics; to Web consultation for both data and remote evaluation practice and tools.

Additional innovation is that “Hyper Atlas” becomes an operational tool for Institutions devoted to real world environment and historic preservation such as a management framework. Also, within the Hyper Atlas, research has built and tested a prototype Historic Center Index by comparing over 10 institutional and scientific index examples. First results show that it might be replicated and adapted to other regional contexts.

6. Historic Center multi criteria evaluation approach

Once that Historic Centers are inventoried and the information put into a stable GIS system, it is possible to perform their qualitative evaluation on the basis of selected criteria.

This relies upon a consolidated framework of well established discipline of Environmental and Cultural Heritage Appraisal founded by Forte in 1977 and strongly fostered by ICOMOS in 1981 (Icomos 1981a, 1981b).

The news 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, adopted MCA for hierarchical ranking of alternatives.

As experimented in several previous researches, specific typologies and generations of MCA approaches have been developed and experimented for the specific purpose.

To know better and evaluate Historic Centers at hands, some criteria have been tested in pioneer specific experiences of urban analysis and evaluation (Nijkamp, 1988; Fusco Girard, 1992; Bentivegna, 1995; Fusco Girard, Nijkamp, 1997) and in subsequent applications (Massimo 1995, 1997).

If criteria are well conceived, selected, defined and managed, MCA makes it possible to understand values, conservation, and interrelated needs for intervention ranking, of each analyzed center.

An innovation in the present research is the number of criteria adopted: 14 criteria have been defined and tested, transforming the evaluation in a demanding and complex procedure.

Criteria adopted in the present research are articulated in four scenarios: insediative; urban; architectural; cultural\tourist.

CRITERIA

N	A.	Insediative Framework
01	A.1.	Geographic location and accessibility in the province
02	A.2.	Good location and orientation-exposition in the territory
03	A.3.	Perceived quantitative Historic Center consistency
B. Urban Quality		
04	B.1.	Urban qualities. Preservation and persistency of original characteristics
05	B.2.	Dimension and ramification of urban streets
06	B.3.	Dimension of urban blocks
C. Architectural Quality		
07	C.1.	Construction or building technical characteristics
08	C.2.	Original architectural characteristics or integrity
09	C.3.	Fronts
10	C.4.	Urban spaces and squares
D. Cultural \ Tourist Attractiveness		
11	D.1.	Landscape attractiveness of the historic center from far away
12	D.2.	Urban attractiveness of the historic center
13	D.3.	Relevance or extraordinariness of monuments. Monumental characters of the historic center itself
14	D.4.	Monuments inside historic center

Table 2 – Heritknow. Criteria for valuation.

For each Historic Center criteria are sorted-up and set-up by specialized analysts and evaluators and later scored on the basis of field work.

All scores assigned by each evaluator to each criterion for each center, checked and summed up, produces the multi dimensional table of MCA, namely the Qualitative Effect Matrix (QEM), which

is processed by the mean of the suitable evaluation tools. All this pieces of information are organized into a Geographic Information System.

This 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.

The knowledge is structured in a GIS to be usable, moveable, interchangeable and efficient. There is no alternative to this state-of-the-art tool to transfigure generic data in a “Knowledge Information Summa”.

The subsequent step, after GIS building-up, is the transfiguration in a Web site accessible to analysts, valutors experts and other general users.

Consequently, for remote use and fruition by general users “Hyper Atlas GIS of Historic Centers” is transformed in Web GIS, and for appraisers it is transformed in an evaluation GIS, *i.e.* General information System (GiS) for Evaluation and Appraisal (EvA), or GiS.EvA, in Italian SGV, Sistema Generale di Informazione per la Valutazione (Stanghellini, 2004).

6. Case Study output: the Historic Center Index

All the information derived from the 4 features of the “Hyper Atlas of Historic Centers” have been organized in the Historic Center Index, designed by comparing over 10 existing Historic Center Indexes, coming from both scientific as well as government environments.

The Historic Center Index has allowed to single out on scientific basis all the Historic Centers of an entire region *i.e.* for 694 Historic Centers. All the information has been put into a GIS and then designed to be accessible on the Web. The Historic Center Index, with a friendly interface, synthesizes in its first page the preliminary information about each center along with an over time cartographic representation.

Then, specific buttons have been designed to connect to other different sources of information such as: comprehensive cartographic basemap; cadastre data; history of the settlement; references; cultural heritage; environmental assets; regulatory plan.

Also, the index can be connected to all the other Indexes, when available.

Moreover, there are specific innovative tools for Multicriteria Analysis; Seismic Vulnerability; Sustainable Intervention; Economic Revitalization.

7. Conclusion

A specific methodology has been set-up to produce at same time both: a systematic “Atlas of Historic Centers” based on objective data; a set of linked multi dimensional evaluations performed with a defined methodology, and specifically with a MCA. The output gives a hierarchical ranking of Historic Centers, useful to set-up a revitalization strategy. The main and newest Case Study is the direct answer to the Institution request and demand to detecting and ranking the most prominent and highest potential Historic Centers of a whole region. The re-use of historic villages may be a key alternative *versus* new spreading out, urban sprawl and further landscape contamination. Estimation might be for a compatible tourism activities, agriculture centers, and small historic town, as productive services and trade small sites of the whole region. The point is exactly to set-up a hierarchical or ranking evaluation of all historic villages compared each other on the basis of selected characteristics. Multi dimensional evaluation has a strategic relevance. It is the basis for decision making about priorities of intervention for settlement revitalization. It is positively advisable to take actions starting from the strongest Historic Centers (the highest in the ranking) where the positive impacts of interventions will be the fastest and most effective, and it will “pull-in” other small Historic Centers, in a cluster interaction, toward revitalization. Research output is the above cited global ranking based upon an exhaustive knowledge about the number of Historic Centers, linked to a systematic multi dimensional evaluation, performed through criteria, of their characteristics. Additionally, a structure for remote evaluation has been set-up. Several pairs/groups of evaluators are active in different places at the same time using some standards for evaluation.

Concluding, results of the Case Study seem to be reasonably consistent compared to rational expectations. Finally, the set-up of such methodology made possible and easy the future monitoring over time (e.g. in a time span of two-four as well as five-ten years) of Historic Centers features, characteristics and quality level. This follow-up will make possible to check-out the positive or negative impacts over time of four agents: nature acting over building; unavoidable decay of building materials; owners maintenance actions; bad or good public interventions. The system has been validated, experimented, revised, then adopted by Institution as a prototype GIS for knowledge preservation, conservation, treasuring of Cultural Heritage of the Study Area.

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Figures

HISTORIC CENTER KNOWLEDGE AND EVALUATION SYSTEM

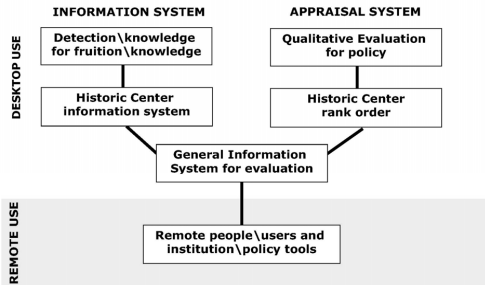


Figure 1 – Historic Center information and valuation system. General framewok. Flow Chart.

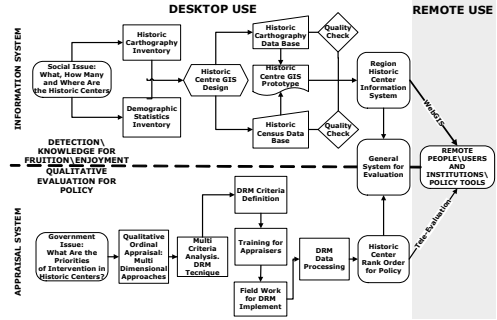


Figure 2 – Historic Center information and valuation system. Detailed framewok. Flow Chart.