
Agribusiness Paesaggio & Ambiente - Vol. XIX - n. 1, Marzo 2016

Tools for the Analysis of the Landscape Structure and its Configuration and Resilience

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Tools for the Analysis of the Landscape Structure and its Configuration and Resilience. *The study will propose an application on Cilento's rural landscape to test a method of analysing the syntactical aspects and of identifying the dynamics of transformation in order to control changes and to define those elements that are resilient to change and how they can be modified to be consistent with emerging new needs. The perceptual dimension of the landscape is affected by many factors that may give rise to numerous and different evaluations; the study, by identifying the syntactic elements and the rules that govern the composition of a perspective system, allows the orderly return of what is recognized by the experiential memory. The study is aimed to define tools in order to educate the residents to avoid insertions or removals, booth natural or artificial components, inconsistent with the rules that govern the identity of the landscape.*

Keywords: rural landscape, sintattic analisys



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The perceptive dimension of the landscape is influenced by many factors; some of them such as the point of view, the atmospheric conditions or the movement of the observer, may allow many different evaluations. Other components are also involved in the interpretation of the landscape such as the personal experiences that lead to attribute different values to the documents contained in it; each observer, in fact, makes a personal experience of the same landscape fixing in his mind a personal image in which the

selective process of the memories emphasizes certain aspects and darkens others.

1. The perceptive dimension of the landscape in Cilento

Referring to the territorial reality at the centre of our study, the focus on the perceptive dimension of the landscape of the territory already finds its foundation in the text of the Guidelines for the landscape of the Territorial Plan of the Campania region where it is expressly hoped to overcome the Scheme of articulation of the landscape through the perceptive-semiological reading of the same¹. It must be taken into account that the concept of "perceived landscape" we refer to, wants to mean "a certain part of the territory, as it is perceived by people, whose character derives

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from the action of natural and human factors and from their interrelationships" (European Landscape Convention, Florence 2000). This interpretation focuses on the study of the belonging of a landscape to a local community context and the appropriateness to the place's characteristics. The meaning of the word "as perceived" requires not only the knowledge of how the landscape is, its morphology and composition, but also what values people attribute to it, values that could be not linked to any formal canon. The importance for a community of recognizing itself in the landscape of the its own native land contains a principle of property, right to its landscape, and, especially in some contexts, it generates tensions and open conflicts.

With reference to the recognizing in the landscape, as in a piece's reading, the domestic observer sees what he expects to see beyond what really appears.

These reflections lead, in a sense, to resize the pure semiological reading, or rather semiotics, because it refers to the communication of signs and not exclusively to verbal languages. It would be insufficient, if not misleading, with respect to the objectives of the protection and enhancement of the landscape as a cultural asset and a resource.

Not to deny the value of the signs that, in our experience of the reality, take on symbolic values but to find ways to help you to understand the territory, adopting an approach that reaches the simple interpretation of the signs to give meaning to everything that underlies the landscape structure.

Here we want mostly focus our study on the identity of rural landscape that in Europe has suffered great transformation over recent years. Crop specialization, intensification and concentration of production have had a huge



Fig. 1

The urbanization of rural landscape (Giungano, Cilento's Park)

change in the use and land cover; cultivated areas have been increased, natural and semi-natural habitats have been reduced, the land use has been homogenized and the use of agrochemicals and technological development have attenuated differences in local production.

The landscape has substantially changed in relation to the different physical and socio-economic contexts, and in relation to the planning and national regulations. Thus, the transformation of rural landscapes has consequences that go far beyond the agricultural sector.

Here, we want to focus the study on the tools for the protection and enhancement of the rural landscape of the Cilento area.

The landscape of Cilento was registered since 1998 in the list of "cultural landscapes" under the patronage of UNESCO; the "cultural landscape" summarizes both settlement and the natural environment in which the use of land and the nature of the places are inseparable and unrepeatable.

Although the European Convention (2006) does not refers expressly to the landscapes of "culture", anyway after the inclusion of the Cilento's between those protected by UNESCO, the Cilento's Park was established as

1) The Regional Spatial Plan for the region (2006) outlines a first attempt at interpretive scheme of the landscapes of the region according to the physical, ecological, agro-forestry, historical and

archaeological sites that compose them. In particular, with respect to the transformation of the rural land, the Spatial Plan stresses the need to ensure that the financial supports and incentives for development

activities for agriculture do not alter the balance of socio-economic, productive, environmental and landscape through funding for crops distorted with respect to the characteristics of the mosaic culture.

protected area because of the strong correlation between natural values and human settlements. Despite that, the urban and landscape realities of the Cilento are highly deteriorated because of the lack of a coordinated and systematic management, that should also involve the citizens in political choices to find in the same local community the main guardians.

To involve citizens in a participatory decisions process you need a real “education” of local communities on the protection and enhancement of territorial identities as potential resources to avoid from the general willingness to import foreign models to local culture without any control of the impact on preexisting.

For this purpose the difficult question arises of rendering the values of the landscape as seen through different lenses that can be applied to focus on the iconographic aspects dear to the local community, the transformations and trends.

The policies of “preservation of the landscape”, “landscape management” and “landscape planning”, as defined in the text of the Convention, want to ensure the landscape quality through the public authorities’ instruments, for a specific landscape, for the safeguard of the aspirations of the people, of their living environment; the legislature has the responsibility to encode a regulatory system in the varied and complex framework of a territorial system in evolution.

The process of implementing the Park Plan includes the plan of the landscape ² that, based on knowledge of the area and its dynamics

processing, should guide all actions of monitoring, observation, rehabilitation and protection of landscape assets³, in order to implement the dictates of the European Landscape Convention, and in particular the meaning of perceived landscape: “designates a certain part of the territory, as perceived by people, whose character derives from the natural and humans and their interrelations”.

The focus on the perceptual dimension of the landscape is also confirmed by the Guidelines for the landscape of the Spatial Plan of the Campania region in which it is hoped to exceed the Scheme of articulation of the landscape through the semiological reading⁴.

You want, in this context, propose reflections on the criteria for a methodology of reading and interpretation of syntactic and morphological features of the rural landscape of Cilento, the reasons underlying the configuration of the landscape of Cilento will be therefore investigated in terms of the set of signs, satisfaction of needs, availability of resources and compliance with the rules. The primary objective of this study is to understand the nature of the landscape and identify the dynamics of transformation in order to define the possible methods of control.

The study identifies as analytical tools the technical maps for the analysis of places and the definition of identity factors and factors of transformation, highlighting the rural landscape of Cilento: stable and unstable areas⁵, horizontal relationships between ecosystems and different landscape units (relations chorologic), vertical relationships between the individual components of an ecosystem in a

2) The implementation of the plan and its development will be coordinated through:

The Environmental Presidium Permanente, the Observatory of Biodiversity and landscape diversity, the Observatory for the application of the European Landscape Convention, System multisectorial environmental monitoring, the

Service to municipalities for the management and urban planning, the Geographic Information System.

3) “... *designates a particular part of the territory, as perceived by people, whose character derives from the natural and human factors and their interrelations* ... “ from: European Landscape Convention

4) Cfr. §5.3.4. Scheme of

articulation of the landscapes of Campania, PTR Campania (2006).

5) Stable landscape: territory not affected by works of human settlement to the steepness of the area and difficulty of access. Unstable landscape: anthropized land subject to frequent changes (cropping systems, buildings, etc.).

**Figg. 2, 3**

Stable and unstable landscape

landscape unit (topological relations) and bio-regions.

Further development of this study could be the involvement of both local user (who has a perception enriched by the knowledge of the places and their history) and random users (which are not affected by the conditioning if not linked to a personal wealth of experience) in a map drawing through experiential to be crossed with the technical.

In the case of requalification of rural landscape becomes a priority to identify the driving forces of the dynamics of change by an examination of the complex changes due to changes or to adaptations generated by natural events or local management of territories.

The survey on local identity, the heart of the sense of the landscape, requires a detail that allows to compare the objective data with those perceptual; the question requires you to deal with a new concept of rural that deny the intensive cultivation and returns an order compatible both with the needs of the new rural economy and with instances of conservation of landscapes.

2. Tools for the Analysis of the Landscape's Structure

At the end of the sixties a system based on economic-entrepreneurial companies of small to medium size finds, despite the logistical problems, the dispersion and the low yields, in the rural reality the right features, polymorphism economic, social mobility and flexibility, to give birth and grow new industrial enterprise⁶. Agriculture in the areas of the hillside was forced to confront the difficult topography of the area that allowed a specialized production, very difficult to modernize and to manage with mechanicals. This production became uncompetitive and has led to a gradual abandonment of large areas by farmers which reconverted themselves in workers in heavy industry in the years of economic boom.

To try to make it financially competitive crops of Cilento, were implemented improper adjustment that are not compatible with the local delicate balance⁷. All this changes the traditional configuration of rural areas, essentially unchanged for centuries: the rich and varied texture (generated by the need to adapt to the morphology of the soil, by the destination to different varieties of crops, by

6) The decentralization of production has been possible thanks to the transformation of

technology, which has enabled small-medium businesses to achieve competitive levels up to

that point only by large enterprises.
7) Scraping and stone clearance of the land to facilitate the use of

the different exposure and fractionation of land) had led to a crop and to a variety of landscapes characteristic for each geomorphological reality.

The phenomenon that has led to major failures to rural landscape in recent decades is the deconcentration of settlements. If in the past the need to agglomerate the residential functions in confined areas had limited the growth of urban centers while maintaining a clear separation with the rural areas, today the increased mobility and the spread on the territory of different functions have expanded settlements up to make it difficult to identify the boundaries between the town and the countryside. The landscape is characterized by the alternation of intensive residential areas with random and point interventions. At the beginning of this intense phase of construction, at the same time commercial and residential, was concentrated along the main roads, then, thanks to the senseless creation of branching roads, residences were built in a diffuse manner throughout the territory. This practice has also been exacerbated by granting of agricultural building indices also to those who did not destine their buildings to rural activities.

In view of these negative trends today we are witnessing the configuring of a new landscape of post-industrial rurality that implies a rural development project of quality based on the sustainable agriculture. Rural areas are invested in the role of conservation and environmental protection of the recovery of a lost food culture. The new concept of rurality is the value system that historically binds a community to its original land which has grown and developed in harmony with the natural and cultural heritage.

This phenomenon, in recent years, has triggered a reshaping of rural landscape in which it is necessary to identify the congruence between the actual use of the areas with their

traditional agricultural potential, in order to redistribute the interventions and diversify productive activities and identify homogeneous areas in which to achieve integrated development programs.

In light of these considerations, more and more rural landscape is related to socio-economic management of agricultural areas and the manner and purpose of their use; just the fragmented management of these areas and the lack of control and coordination by local authorities produced new phenomena of further deterioration landscape heritage. It is therefore necessary, in the work of upgrading and management of the rural landscape, developing new means of control. In this study, therefore, rather than identifying a new critical reading you want to formalize a methodology of classification in the perception of objective perspectives of the landscape, by an external party, taking its specific meanings in order to facilitate the recognition of the underlying syntax. Not an overall interpretation of a territory under the semantic aspect but the recognition in partial views in which detect the syntax that governs the relationship between the various components present, as relationship between diachronic perspective planes and conditions of perception.

Under the word landscape in the dictionary Devoto-Oli you read: ... part of the territory considered from the perspective point of view or descriptive ... and the Article 1 of the European Landscape Convention describes it as ...*an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors*. These definitions, which may give rise to different levels of interpretation, underline, in particular, the objective aspect of the reading of the landscape.

It is thus determined the need to translate what appears to us as an extraordinary collection of short or infinite components:

mechanical means, plowing with plowshares deep crossing the humus layer and bring to light not fertile soil and large amounts of stone and clay,

often have made the land particularly vulnerable under the action of the rains. Moreover, often, to questionable policies of restoration

of greenery and with government funding, they have been planted, both on public lands and in private funds, non-native tree species



Figg. 4, 5
 Prospective systems with known characteristics (Chianti's territory, CinqueTerre's terracing)

mountains plains barren hills dense forests city suburbs waters and sky taken in their singularity or in their interdependence may, however, be traced to simple images, in perspective views in which .. the look is *the tool that knows how to capture the visible and invisible textures of a landscape as a set of heterogeneous elements in relation to each other* (Venturi Ferriolo, 2009).

Bringing in a simplified view of a landscape requires a set of parametrization. The first sees the exclusion, in the field of investigation, the dynamic perception. It will, in fact, translate the static perception in a sequence of pictures or snippets defined as perspective systems, static three-dimensional visions, whose perception can vary in relation to environmental and diachronic conditions. It is required that the systems perspective are identified regardless of the parameters that can change the usual reading, such as extreme weather conditions or states of light radiation extremes⁸.

In addition, each system perspective may be essential to make rounds of observations differentiated in relation to the seasonal, when

the state of vegetation can reduce or extend significantly the perception of certain elements in the system.

To choose the perspective system, in which to perform our investigation, we need a careful understanding of the studied area (more or less wide) or a documentation to allow the identification of visuals or views that possess representative iconographic levels and in which the perceived characters allow the global understanding of the territory.

It furthermore appears of particular influence the choice of the position of the observation point for the visual. Certainly it will be chosen the most common, ignoring, in the observation of large systems perspective⁹, the small difference in perception of the possible horizontal and vertical movement of the viewpoint. On the contrary, in observing visuals of limited size, the position and the distance at which there arises may be relevant and determine its uniqueness¹⁰.

The structure of the system prospective analyzed, which can be characterized by different physiographic units of landscape¹¹, can be reduced by three-dimensional reality

absolutely inappropriate to the local climate profile.

8) Certainly the solar grazing radiation or rain and, even more, the snow or fog determine a degree of alteration of the landscape up to render it unrecognizable or not usual.

9) The perspective system to be analyzed is significant part of a broader in which more components and key features are included.

10) Moving, even a little, the point of observation may involve the inclusion of elements that can lead

to a substantial modification of the visual object analysis.

11) The physiographic units of the landscape are reference territorial units, they include... portions of geographically defined territory who have a characteristic structure and

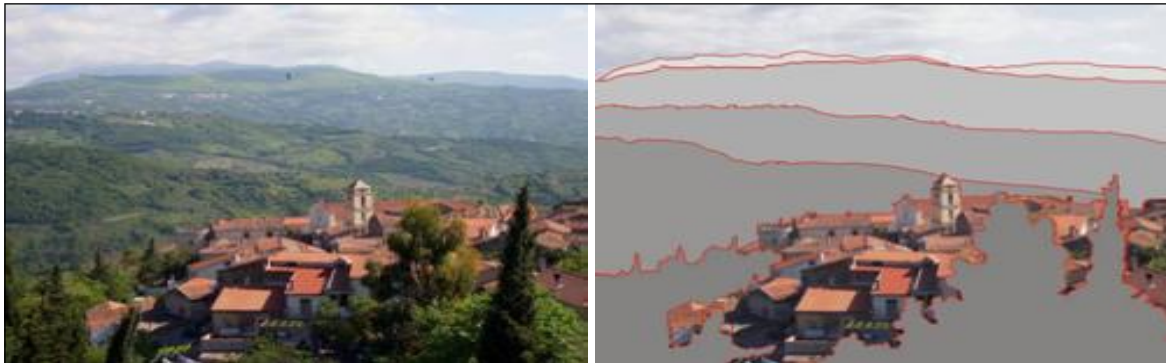


Fig. 6, 7
Simplified shape of the spatial configuration of the perspective system (Stella Cilento)

(analysis of the depth of field) in a variety of two-dimensional planes, through the division into perspective planes (foreground, second, third, etc. background) recognized, using photo surveys, schematics, eidotype, simplifying and making explicit complex constructs.

If, as stated, we exclude the analysis of the semilogical size of the single components, regardless, therefore, from their judgment of quality; the work of discretization moves to the task of breaking down the prospective system¹² and analyzing and then building a hierarchy of components that belong to distinct perspective planes.

The components detected and identified can be described by the nature or origin¹³ and their specific properties¹⁴ which are the following:

- Size - significant / insignificant (in relation to the observed system);
- Form - simple / complex;
- Geometry - linear / polygonal;
- Orientation (with lines of force in horizontal,

vertical, oblique, etc.).

- Contours - blurred / net, closed / open, continuous / discontinuous;
- Texture - regular / irregular (in relation to the weft or warp);
- Colors - primary / complementary;
- Grit - uniform / smooth / move / rugged);
- Roughness - reflective / absorbent, transparent / opaque, clear / blurred. (in relation to the surface).

Each detected component in the image: town, plains, hills, sea, trees, can be described as a function of the identified parameters. For example, the town has a considerable size, a complex shape, a polygonal geometry, a horizontal expansion, sharp edges, etc. or a component prevails as size than the others of the same shape etc.

These properties combine to determine a prevalence in the prospective system rise to a hierarchy of components.

The single observable¹⁵ component can be

physiographic patterns of land cover - these are attributed, by the Institute for the Protection and Environmental Research, one of thirty-seven *Types of physiographic landscape* identified as a representation of natural scenery recognized and codified for the Italian territory.

12) It shall not be read in particular times and environmental conditions in which the oblique light tends to

the dramatization of the perspective system by increasing the depth of field which would make it difficult to read analytical.

13) Artificial or natural, and its inclusion in the system due to spontaneous, random, evolutionary or anthropogenic operation.

14) A hill has dimensional characteristics, colors, materials, etc; a prospective system may include more hills which is a main

component because it has different characters. The sea and the mountains may insist on a prospective but not necessarily both be key components.

15) The limit of recognizability is also given by the scale detection landscapes (large or glimpses of modest dimensions) and by the quality of the air as the transmission medium.

16) In fact the same main



Figg. 8, 9
Shape and components of village (Trentinara and Pisciotta)

classified into: primary, coordinated and subordinated.

The primary component, when present, prevails in the prospective system as a characterization, often as a dimension, and it has its own complete identity¹⁶. The coordinated components are a limited number, in most cases, they are similar for types and entities to the main components, often contribute to determine the value of the scenic perspective system, are subsidiary to the main component and strengthen its role.

The components subordinated are numerous, in most cases of modest size, occupy undifferentiated positions within the system prospective, have a typological nature diversified and not recognizable in a unitary role. The large number of subordinated components enriches the perspective system and overlap equally to other components without necessarily enhance scenic apparatus.

After identifying hierarchies and characteristics of the components you can make the syntax analysis that underlines the system architecture perspective; this is discernible in paratactic or hypotactic¹⁷. It is considered the paratactic structure which notes a preponderance of coordinated components,

organized so as to compose a scenario, among which it is difficult to recognize a hierarchy.

Instead, you can identify an hypotactic structure when prevail the subordinate components that emphasize and increase of details the spatial organization of the perspective system (often disguising or concealing the role of the main components and coordinated).

Having identified the structure you can make a first analysis of the relationships between the different components according to their placement / disposal.

In a perspective system, in fact, it is always possible to identify those relationships, unaltered even by changing the distance and the position of the observation point, generated by the arrangement of components which can be placed:

- Central or marginal;
- Concentrated in an area bounded or distributed;
- Isolated, side by side or stacked.

The subsequent analysis is related to the characters with which the components are presented and combined each other by establishing typological concordances¹⁸ through effects:

component prevails in the visual but does not determine its quality.

17) The terminology has been adopted by transferring their own definitions of the linguistic discipli-

ne of technological reading of a complex system like the landscape.

18) In the search for inductive detection of the concordances it enables to state that when a

phenomenon occurs always with the same attributes these are believed to be cause or effect of the phenomenon itself.

19) The topological relationships are



Figg. 10, 11

Example of the hypotactic and paratactic landscape (Casalfinocchito and Trentinara)

- Chromatic (homogeneous / mixed);
- Light and shade (strong / weak);
- Geometric (agree / disagree);
- Material (homogeneous / heterogeneous).

This determines the specific spatial configuration which is further analyzed through the characterization of the topological relationships¹⁹ between components:

- Ordered or disordered;
- Balanced or unbalanced;
- Symmetrical or dissymmetrical;
- Rhythmic (sequences: uniform, alternating, increasing, decreasing).

The reciprocity between these relationships determines configurations characterized by a greater or lesser inertia to perceptual modification²⁰.

By the operations of detection of the components contained in a perspective system and the type of relationships originated between them is possible to determine: the identity and specificity (autonomy), the consonance of interaction (coherence) and the ability of resistance to changes (resilience)

The syntactic frame, through the interpretation of the structure and of the relation-

ship between the components, let us provide a catalogue of the most frequent perceived models in the areas under consideration. These, include part or all of the detectable components in the concerned areas; their detection and classification would allow the construction of a repertoire of syntactic frameworks, which can preserve the memory of configurative experiences of a territory, for the education and training of all those who, for various reasons, are involved in land management²¹.

When inserting new components or in rehabilitation of an area is necessary, therefore, the identification of prospective systems affected by the intervention; are determined for each of these individual components and decoding the syntactic structure. This first phase allows to anticipate the level of intervention possible considering that:

- In a paratactic structure the character of the system has a strong identity but the inclusion of new components, in particular those uncoordinated, is more evident;
- in a hypotactic structure, however, the increased complexity and richness of components allows a greater possibility of

a specific of the geometric relationships between components characterized by the ability of preserve the relations after the application of a transformation (translation, rotation, scaling, etc.).

20) When the landscape is

dominated by a component with a particular expressive power the topological relationships, while changing the viewing position, remain unchanged.

21) The analysis of the syntactic structure of a system perspective, the

detection of components and mutual relations are designed to define: the identity and specificity (autonomy), the consonance of interaction (coherence) and the ability of resistance to changes (resilience).



Figg.12, 13

Examples of overlapping components inconsistent with the area's image

inclusion of small components and limited modifications.

In the next step through the analysis of the layout / placement of components and their characters is possible, without altering the topological structure, to define the tolerable degree of modification of existing components (primary, coordinated and / or subordinated), the type and size of those to be inserted.

The variety and complexity with which the components configure the infinite perspective views of the same landscape, along with the emotional bond that man establishes with the places, can nullify most of the possible representations and pose the need not so much of a typology, but of an instrument which can return data as diagrams, conceptual plans and formal relationships, and take on the character and value of recommendation.

The study described by identifying the syntactic elements and the rules that govern the composition of a perspective system, allows the orderly return of what is recognized by the experiential memory. Reading the natural adaptations or the ones produced by men, as a mechanical operation, where the dynamics of change are returned in geometric expressions, materials or color, is functional to outline the rule that oversees the equilibrium of a perspective system.

A prospective system in equilibrium reflects the order that regulates the relationship with the nature of places and the life that takes place, however, is a system in constant evolution,

capable of transformation that often contradict and unbalancing the relationship between the component parts.

You can change the syntactic construct of the prospective system, provided that the rules of composition and the relationships between components are controlled in order to maintain the existing quality through responsible choices.

Too often in control of the interventions in an area you are working with regulatory instruments; this practice has proved a failure because it only aimed at regulatory constraints without the cooperation of the residents; it is essential to change orientation, dive into an existing space, design and construct a reality designed from the inside, which demonstrates the priority of participation of those who reside or use the area in question. In this way, the means of protection and restoration are not rigid constraints to be respected, but how to use the land consistent with the needs of residents.

The study is aimed, therefore, to tools that have the function of educating the individual residents to avoid producing imbalance in the perspective system through insertions or removals of natural or artificial components inconsistent with the rules that govern the balance and identity.

This belief has led the research for a method of analysis that can return the warp of a given landscape system on which suitably incardinate the necessary future changes; the purpose is to educate and to let be able to understand the

dynamics that shape the landscape all local users that can be the main promoters of protection measures in the transformation processes.

We mean that through the recognition of the syntax of the landscape is possible to identify a range of solutions congruent indicating how you can correctly place any transformation in compliance with the higher-level system landscape.

The aim is twofold: on the one hand to make known, through the codification of the significant elements of the landscape, the value of the individual components and the relationships between them, on the other hand provide support to the management of the image of the territory. Therefore, it is necessary to structure a catalogue of models, with glossaries of compatible solutions, which, in the management and redevelopment of the area, can be used as a tool to control the possibility of intervention whenever there is a change.

It is hoped that, by giving wide diffusion to such a model, it triggers a participatory process from the bottom that makes users able to distinguish the models extraneous to the context in order to avoid to import improper iconography of different kind in building solutions as in the warp and culture and in the works of adaptation of the land.

□

Sommario

Lo studio propone lettura del paesaggio rurale del Cilento attraverso una metodologia di analisi che com-

porta la individuazione degli aspetti sintattici e delle dinamiche di trasformazione del territorio. La dimensione percettiva del paesaggio è influenzata da molti fattori che possono dar luogo a numerose e diverse valutazioni; lo studio, individuando gli elementi sintattici e le regole che governano la composizione di un sistema prospettico, permette la restituzione e il controllo della identità dei luoghi. Gli strumenti individuati consentono di controllare le modificazioni e di definire gli elementi resilienti al cambiamento oppure il grado di modificazione accettabile in coerenza con le nuove istanze di sviluppo locale.

Rigraziamenti e riconoscimenti.

L'Introduzione e il § 1 sono a cura di P. De Joanna, mentre il § 2 è a cura di A. Passaro

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