Complex Values-Based Approach for Multidimensional Evaluation of Landscape

Maria Cerreta, Pasquale Inglese, Viviana Malangone, and Simona Panaro

Department Architecture (DiARC)
University of Naples Federico II, via Forno Vecchio 36, 80134 Naples, Italy
{maria.cerreta,viviana.malangone,simona.panaro}@unina.it,
pasqualeinglese@gmail.com

Abstract. The several meanings that landscape takes in all scientific studies and in the common speech highlight the complexity of a concept that finds in the richness of its dimensions the understanding key and the interpreting matrix for actions aimed at local sustainable development. A new concept of landscape identifies the relationships between the various points of view and different interpretive approaches, overcoming the consideration of territory as a physical-geometrical reality at the service of economic aspects. The paper, starting from the evolution of the landscape's concept, focuses on the management of its complexity in the transformation processes included in the dynamic context of landscape's cultural values and in development strategies designed to support and strengthen these values. It has been structured a multidimensional methodological framework oriented to the evaluation of landscape cultural values, tested in National Park of Cilento, Vallo di Diano and Alburni (Italy).

Keywords: Complex landscape, cultural values, multidimensional evaluation.

1 Introduction

Landscape is a place and a concept where insiders and disciplines meet, collide and, increasingly, interact. To improve interaction, and to assist those who care for and manage landscapes, it is important to find ways of achieving a more integrated and comprehensive approach to understanding landscape values.

Traditional landscape assessment methods, which focus on discipline-specific value typologies, may fall short of revealing the richness and diversity of cultural values in landscape held by insiders. Achieving a more integrated approach requires the establishment of a conceptual framework that is inclusive of perceptions founded in disciplinary methodologies and captures the rich and dynamic landscape experienced by insiders. While it is unnecessary for different forms of landscape knowledge to share a methodology or a theoretical foundation, the key is a common frame of reference that has a reasonable fit with the range of ways in which disciplines and communities perceive and value landscape [1].

According to the above perspective, the landscape framework provided by the Cultural Values Model [2] has attempted to offer a conceptual linkage between contemporary

B. Murgante et al. (Eds.): ICCSA 2014, Part III, LNCS 8581, pp. 382–397, 2014.

theory on landscape, space and time with the range of ways in which insiders and disciplines express what is important to them about landscape.

New transformations of landscape concern not just the physical landscape, but also the collective memories, meanings and identities that the landscape holds. Planning theory and practice currently offer relatively little guidance as to how to address meaning and value, particularly at a landscape scale. Recent literature from a variety of disciplines has stressed the need to develop holistic models of understanding landscape. The absence of integration between disciplinary approaches is relevant, and the need to involve communities in defining what is important and distinctive about their own landscapes. The Cultural Values Model sets out to develop a conceptual framework to assist in understanding multiple cultural values in landscape. Although the primary focus of the Model is to address the perceived shortcomings in planning theory and practice, its relevance to inter-disciplinary work also forms a major component of the approach [2]. According to the model, values in landscapes include those expressed by associated communities and those identified through a variety of disciplinary approaches. Using case studies, the nature and range of landscape values as expressed by those with special associations with particular landscapes, examining the nature of the meanings and values ascribed by disciplines with an interest in landscape, and how various disciplines model landscape to convey these values.

An analysis of these findings generates a landscape framework consisting of the Cultural Values Model [2] that offers a conceptual structure with which to consider the surface and embedded values of landscapes in terms of *forms*, *practices* and *relationships*. The landscape framework is found to be useful not only for generating a comprehensive picture of key landscape values, but also in offering an integrated evaluative approach useful both for planners and other landscape-related disciplines.

Much has been written about the significance of landscape to communities and their cultural identity [3,4]. Culture and identity are therefore not just about social relationships, but are also spatial. Inappropriate landscape development can change or obliterate locally distinctive characteristics and cultural meanings, creating a break between communities and their past [5].

The global groundswell of concern about such losses suggests that there may be shortcomings in the identification of landscapes' cultural significance, and that we should pay better attention to how to sustain landscape's contribution to cultural identity and diversity. A landscape's contribution to culture/s requires decision-makers to have a detailed knowledge of the particular values of that place, and how the values help support (or otherwise) cultural identity and diversity. Planning and management decisions would need to be taken in the context of the cultural dynamics of landscapes [6], and new development would need to be designed to support and enhance such values [7]. In order to support this, decision-makers would understand the nature and range of values that may be present in a given landscape, how these are spatially spread, and how they interact [8,9,10,11,12]. Yet current methods of landscape evaluation, as commonly incorporated into national legislation and institutionalized assessment mechanisms, may fail to do justice to the diverse, overlapping and irregularly spread values that are present in landscapes.

Formalized landscape assessments generally undertake to define set categories of value using predetermined criteria (aesthetic, historic, scientific, etc.) and are commonly set up to provide a series of parallel assessments by different disciplinary experts. What is perceived to be of value will depend on the particular interest of the discipline. The result can, firstly, be a static model of significance – a map of aesthetic, historic, and ecological values, for example – with no way of conceiving of the landscape's cultural dynamics as a whole [1].

Multi-disciplinary landscape assessments [13] offer a broader understanding of landscape values than a single discipline, but such collaborations can be hindered by the incompatibility of landscape-related theory and methodology.

The failure to understand landscape in a holistic sense requires an integrated, comprehensive theoretical and analytical framework that adequately address landscape study, assessment and planning. Ideally, such a framework would offer an effective unifying approach that enables the multiplicity of information (from whatever source) to be seen as an interlinked whole.

In relation to considering the cultural significance of landscape, a similarly holistic framework would be need to conceptualize landscape values as a whole, in a way that incorporates the very different assessments of value that might be made to from within different disciplines, as well as the values expressed by insiders for a given landscape [14]. According to this perspective the Cultural Values Model was developed in an attempt to respond to the above challenge by developing a holistic conceptual structure for considering the diversity of cultural values that might exist in any given landscape, and how these might relate to and reinforce one another. In order to avoid capture, a conscious choice was made to step aside from the lenses of predetermined value typologies, and instead to attempt to discover, from communities themselves, what it was about their landscapes that they particularly valued. The development of the model was informed by contemporary theories on the nature of landscape, and prevailing holistic models of landscape.

The paper, starting from the methodological framework proposed by the Cultural Values Model, proposes a multidimensional evaluation approach in order to identify cultural values of the National Park of Cilento, Vallo di Diano and Alburni, in Campania Region, Italy, through a testing conducted in the village of Castel Ruggero, municipality of Torre Orsaia. In the second section, we analyze the theoretical and methodological assumptions related to the concept of landscape cultural values. In the third section, we describe the evaluation process elaborated for Castel Ruggero case study. In the fourth section, we examine the results and express some reflections outlining future developments of the research.

2 Landscape Cultural Values: A Methodological Approach

Current interpretations propose that culture is a dynamic process whereby people are actively engaged in constructing group life and its products [15]. People are considered to live culturally rather than in cultures, with the generative source of culture being human practices rather than in representations of the world. These dynamic

senses of culture are particularly relevant and can be a key interpretative concept of cultural values [15,16]. The concept of value is generally considered a social construction arising from the cultural contexts of a time and place. Brown et al. [17] suggest that people hold certain values but also express value for certain objects. In this sense, understanding how a landscape is valued involves understanding both the nature of the valued "object" (or aspect of landscape), and the nature of the expressed value/s for that object. These values do not speak for themselves: they can be identified when they are expressed by those who are part of the cultural context, or by those who are in a position to observe and understand.

Arising from the evolving meanings of "culture" and "values", cultural values are taken to be those values that are shared by a group or community, or are given legitimacy through a socially accepted way of assigning value. This suggests that there can be multiple ways of valuing landscapes: values shared by those within an associated group as well as those attributed by disciplinary experts [1].

At the same time, the perception generally differs between "insiders" and "outsiders": most experts, developers and policy-makers are outsiders to the area where they are to work, but an outsider can also be a person who does not belong to the local community, the same socio-economic group or have the same education and training.

Insiders and outsiders perceive, understand and create the landscape around them through the filter of their social and cultural background.

A relevant example of the Cultural Values Model implementation [2] is that of the two case studies of Bannockburn and Akaroa, in the South Island of New Zealand. The choice of case study areas was guided by a preference for landscapes that were distinctive, had recognized and varied cultural values, and had a resident community of which some people at least were likely to have developed strong connections with the landscape over time [18,19].

The Bannockburn area, a broad inland valley within rugged tussock-covered ranges, was extensively mined for gold the 19th century, and today is renowned for its quality vineyards. The Akaroa basin has at its heart a long narrow harbor, a shoreline is dotted with small settlements, and is encircled by rural and forested land rising to steep volcanic ridges. In both areas, Maori still retain close links with the land. Additionally, both landscapes are known to be undergoing relatively rapid modification from influxes of newcomers and land use changes.

The methodology applied consists of subjecting an in-depth semi-structured interview to a sample of people of different culture, profession, age and economic status, choices between permanent and temporary residents. The interviews were centered on the question: *what is important to you about this landscape?* What interviewees had to say about their landscape was used as the "way in" to understanding the meanings and values built up through their experience of the landscape.

The results were analyzed for statements that conveyed that the interviewees attributed some importance or significance to that matter, regardless of whether it fitted any preconceived notion of landscape held by the interviewer.

The data was further selected according to whether the expressed sentiments were shared or supported by others. From this broad picture of values as a whole, patterns and linkages were sought. Both case studies have revealed that the values are not

limited to physical forms of landscape, but also to past and contemporary practices, and internal relations of the landscape itself. Although visual and experiential aspects of the landscape have emerged as important, members of the community have also given great importance to the values that had developed over time.

By the analysis result clearly many overlaps between the landscape interests of community members (insiders) and disciplines (outsiders). Insider perspectives were founded in personal experience and knowledge of place. It was also notable that insiders emphasized intangible values to a far greater extent that would usually be elicited through standard expert-based studies of landscape's material forms. As well, community members, did not generally confine themselves to landscape as defined through standard assessment typologies, but ranged freely across many topics. This is not to say that insider views are necessarily more right than those of outsiders: the crucial issue is that both forms of knowledge contribute to understanding landscape values as a whole. From the analysis and interpretation of the responses to the interviews the Cultural Values Model was developed and structured by three components of value. The first, denoted by the term *forms*, belong the physical, tangible and measurable elements of the landscape, both natural and artificial. The second, indicated by the term *relationships* is related to the second category to which belong the links generated by people-people interactions in the landscape, those generated by people-landscape interactions, and valued relationships within the landscape even where there is little or no direct human involvement. The third component, defined *practices*, is inclusive of both human practices and natural processes and include past and present actions, traditions and events; ecological and natural processes; and those practices/processes that incorporate both human and natural elements.

Indeed, human activity affects natural processes and, conversely, natural processes affect human activity. It thus appears how nature and culture are closely related and how natural processes are inseparable from the cultural ones [2].

These three fundamental components - *forms, relationships* and *practices* - offer the basis for an integrated understanding of landscape and its values and encompass the range of landscape values expressed by both disciplines and insiders. There is a clear call within contemporary thinking on landscape and space that it is necessary to move beyond static understandings, and to be inclusive of movement, social practice, and time. By considering the three model components in a dynamic sense, it can be seen that *practices*, *forms* and *relationships* are continually interacting to create landscape. Such interactions were implicit in many of the reported values from the case studies, and it was rare for interviewees to talk about one component (e.g. a *form*) without further elucidating its value in terms of *practices* or *relationship*s, or both.

It is therefore proposed that these dynamic interactions help generate cultural values, and are also generated by them. Data analysis suggests that landscape has yet a further dimension: *temporality*. The time-thickness of landscapes was clearly evident in the case studies, where interviewees spoke of aspects of the past when referring to their landscapes.

Accordingly, a further variant on the model represents landscape as a *continuum*, bearing within it the forms, relationships and practices of the past that influence those of the present, and thereby shape landscape as it is perceived. It expresses the concept

that landscape is created from the dynamic interactions of forms, practices and relationships, occurring over time, and that landscape values are contingent on elements from both the past and present. Landscape is thus always changing, carrying forward the threads of the past and weaving them into the future.

To describe the distinction between past and present value the terms *surface values* and *embedded values* are proposed [2]: surface values are the perceptual response to the directly perceived forms, relationships and practices, while embedded values arise out of an awareness of past forms, practices and relationships.

These concepts form the basis of the Cultural Values Model, offering a provisional framework for understanding multiple cultural values in landscapes: landscapes can be understood in an integrated way through consideration of forms, relationships and practices; the dynamic interactions amongst these; and the dimension of time. These components give rise to, and result from, cultural values in landscapes. Accordingly, it is necessary to take account of all of these landscape components to achieve an understanding of cultural values as a whole.

3 Cultural Values Model implementation: The Experience in Castel Ruggero

The Cultural Values Model approach has been the methodological framework considered for identifying and evaluating the landscape cultural values of Castel Ruggero, a village of Torre Orsaia municipality, in National Park of Cilento, Vallo di Diano and Alburni (here in after NPC). This experience is part of the Research Project "Cilento Labscape: an integrated model for the activation of a Living Lab in the National Park of Cilento,Vallo di Diano and Alburni", funded by FARO Program 2012-2014 "Funding for the Start of Original Research", University of Naples Federico II.

This research aims to develop a methodological framework that integrates the contribution of expert knowledge with context-aware knowledge to activate a Living Lab based on an approach of open innovation, in order to outline an innovative model of smart endogenous development and to enhance the local landscape resources. This proposal seeks to formulate an innovative approach that integrates the concept of Living Lab and the complex meaning of Smart Landscape by structuring a model of interpretation and evaluation of landscape cultural values, which can be implemented for the enhancement of the landscape of the NPC. This Park is enlisted as UNESCO World Heritage Site, MAB-UNESCO List of Biosphere Reserves, it is a Geopark and it is member of the UNESCO HELP-BASIN network.

The study area comprises 95 municipalities and Torre Orsaia, with Castel Ruggero village, is one of them. One of the aim of the research is testing a process of territorial co-design based on the interaction between landscape values and human economy ones. In Castel Ruggero a workshop was organized in order to address the issue of revitalization of abandoned (or in state of progressive abandonment) landscapes, helping to create a virtuous circle of introduction and management of innovation, by networking resources and planning. The village of Castel Ruggero (Figure 1) is the context where micro-actions of revitalization are co-designed, paying attention to local conditions and, at the same time, opening to innovation.

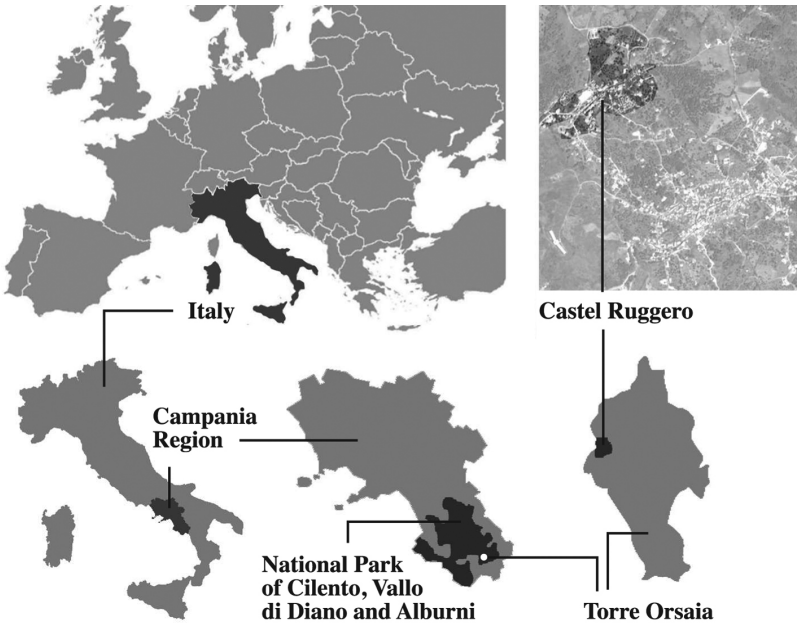

Fig. 1. Castel Ruggero localization

About fifty architecture students took part to the workshop of the University of Naples Federico II. With the support of tutors and experts, they participated to a three days activity in research, whose aim was to seek the conditions for village's transformations processes according to the Living Lab methodology: find out, co-design and test solutions with the users local community. This methodology is based on the involvement of specific groups of interest, in order to identify together particular needs and solutions to them.

In Castel Ruggero's workshop a group of insiders, mostly elderly inhabitants, has been compared to a group of outsiders, young architecture students, for letting the village's latent values come out and for making a map of values describing in an innovative way the context in new circuits.

The methodological approach has been articulated in three main phases (Figure 2):

1. Cognitive framework, aimed to surveying hard data and soft data;
2. Data processing, aimed to identifying values' meanings;
3. Evaluation, aimed to identifying relations between values and meanings.

In cognitive framework phase, the surveying of open spaces and buildings, elaborated in GIS maps was useful to carry out the knowledge of the village through specific analyses of physical features of buildings (details and levels of neglect of buildings, conditions of degradation, etc.) and of open space (use and characteristics of open spaces). At the same time, the cognitive framework was integrated with: a survey of

in depth semi-structured interviews to the inhabitants aimed to identify the values and their meaning for them; a focus group with inhabitants and students for public sharing of visions and actions; a collection of storytelling of the architecture students, that give an external point of view, from those who spent time in the village has guests.

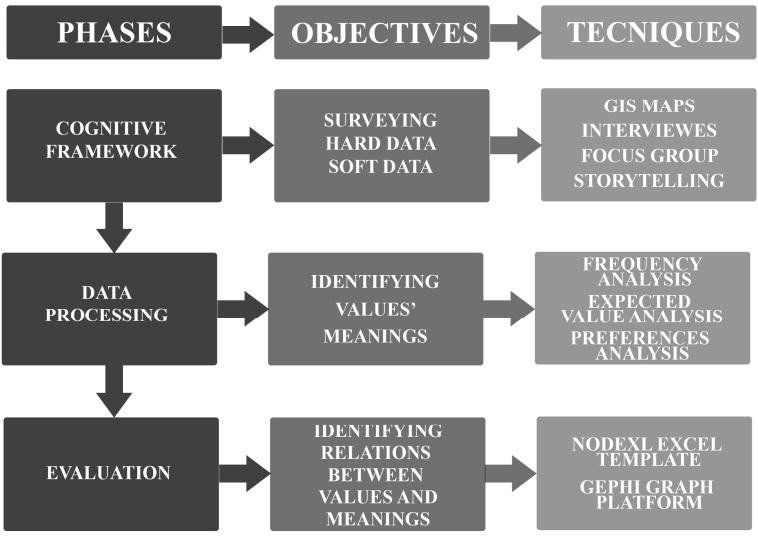

Fig. 2. The phases of the methodological approach

In order to identify the complex values for insiders and outsiders the Cultural Values Model approach has been used to decode soft data. This kind of information has been a very useful benchmark to understand in details not only different points of views, but also significant physical features of the village with different meanings assigned. This has helped the selection of a set of information relevant for triggering small co-designed actions with the local community.

More precisely the Cultural Values Model allowed to find out the potential of the range of values assigned to the Castel Ruggero's landscape, and to cope with the identification and the interpretation of values with an interdisciplinary attitude.

Starting from the interviews and the storytelling, the meanings and the values given to the landscape have been defined and classified in: *forms*, *relationships*, and *processes*. The concept of practices, just the original Model, has been replaced by that of processes, able to better explain the main dynamics that have characterized the changes and influenced the perception of the values.

In specific terms, *forms* include natural features, contemporary features, human-made features, and historic features; *relationships* express sense of community, stories, feeling of belonging and sense of place; *processes* identify natural processes and human processes; *temporality* recognizes embedded values.

This classification in its use reflects the values expressed, by testing their reliability and their applicability. It clearly shows, indeed, that the physical features of the landscape are strictly linked to the immaterial ones, and, thus, to the values that assign them their meaning and importance. As it can be seen in Tables 1 and 2, the immaterial features identified are more than the materials and, at the same time, there is no place mentioned without been assigned to a single or more kinds of values (*forms*, *relationships* and *processes*). Each of these latter has been represented in the Tables 1 and 2 with keywords summarizing their meaning for Castel Ruggero. The model, implemented in the specific context, aimed to survey the local meaning for universal forms of values.

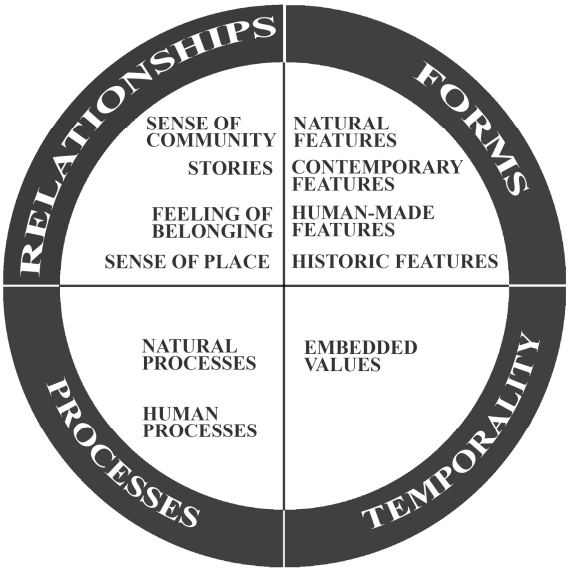

Fig. 3. Cultural Values Model interpretation: forms, relationships, processes and temporality

To analyze and identify the Castel Ruggero landscape values, the weight of the keywords and places mentioned in the interviews has been assigned according to their frequency and the expected values suggested by both the insiders and outsiders.

In details, the frequency regards the keywords and places referring to a particular value in the interviews and storytelling, while the expected value expresses the ranking of importance of keywords and places mentioned by the insiders and the outsiders. The preference is the synthesis of frequency and expected values. It allows to identifying a final ranking of keywords and places that define the specific values for Castel Ruggero village. Each keyword enriches the semantic domain of the observed issues, and knowledge is represented as a network of values linked by different associations. The main purpose of this form of interpretation is to find a finite set of basic semantic features defined without ambiguity that combined according to specific rules expresses landscape complex values of Castel Ruggero.

Table 1. Storytelling decoding: forms, relationships, and processes

	Values	Keywords	Places	Frequency	Expected value	Preference
Relationships	Stories		'Santa Maria'	2	1°	0,200
			'Pecorelli'	1	1°	0,100
			'Iannuzzi'	1	2°	0,050
			'Castello'	1	4°	0,025
	Sense of places	Rurality		1	1°	0,100
		Slowness		1	2°	0,050
		Nostalgia		3	1°	0,300
		Relation man-nature		1	1°	0,100
		Naivety		1	1°	0,100
		Serenity		2	2°	0,100
		Waiting for change		6	1°	0,600
		Value of time		1	1°	0,100
		Reliving childhood		1	2°	0,050
		Memory		1	1°	0,100
		Romantic		1	2°	0,050
	Sense of community	Friendly		2	1°	0,200
		Hospitality		2	1°	0,200
		Hostility		2	1°	0,200
		Isolation		1	2°	0,200
		Get together	'Puosti'	2	1°	0,050
			'Lavatoio'	1	2°	0,200
	Feeling of belonging	Home	'Torchio'	1	2°	0,200
			Luigia's home	5	1°	0,500
			Biagio's home	1	1°	0,100
			Mafalda's home	1	1°	0,100
			Corrado's home	1	1°	0,100
			Carmine's home	1	1°	0,100
		Roots	'Castello'	1	2°	0,200

The graphic representation of the semantic networks identifies *nodes*, variably connected by arcs that indicate the *semantic relationship* between two values. Each value, considered as a node in a *network* of values, has a specific weight in the network depending on the quality and quantity of relationships that generates with the other nodes. The different values identify a *complex semantic network*, considered as large collection of interconnected nodes.

Networks are graphs that describe the structures of interacting systems and give substantial information about the patterns of connections between the nodes in a particular system. Knowing about the structure of networks and their arrangements enables one to make certain types of predictions about their behavior.

Referring to the graph theory and network analysis [20,21], to detect the weight of each value within its semantic domain, some analysis have been made that return the following indicators:

Table 2. Storytelling decoding: forms, relationships, and processes

	Values	Keywords	Places	Frequency	Expected value	Preference
Forms	Natural features	Sea		5	1°	0,500
	Contemporary features	Mountains		3	2°	0,150
		View	'Castello'	8	1°	0,800
		Rural		3	1°	0,300
		Property speculation		2	2°	0,100
		Empty houses		2	1°	0,200
		Cars		1	3°	0,033
		Barriers		1	1°	0,100
		Watching		1	2°	0,050
		Uphill		2	1°	0,200
		Ruin		1	2°	0,050
		Mansions		2	2°	0,100
	Human-made structures	Alleys		3	1°	0,300
		Mansions		1	1°	0,100
		Ruin		1	2°	0,050
	Historic features	Decay		2	1°	0,200
		Portal	'Imbriachi'	1	2°	0,050
			'Servi'	1	3°	0,033
			'Pecorelli'	7	1°	0,700
			'Mariosa'	6	1°	0,600
			'Iannuzzi'	1	2°	0,050
			'Santa Maria'	2	3°	0,066
			'Castello'	1	4°	0,025
Processes	Natural processes	Earthquake		1	3°	0,033
	Human processes					
		Sense of community		2	1°	0,200
		Depopulation		4	1°	0,400
		Property speculation		1	1°	0,100
		Physical neglect		2	1°	0,200
		Farming		1	1°	0,100

- *Betweenness* is a centrality measure of a vertex within a graph and quantifies the number of times a node acts as a bridge along the shortest path between two other nodes;
- *Closeness centrality* provides a measure of the distance of a node from all other nodes, indicating which points in the network minimize the average distance between the nodes.
- *Eccentricity* is a parameter associated with every conic section and it can be thought of as a measure of how much the conic section deviates from being circular.
- *Eigenvector centrality* is a measure of the influence of a node in a network. It assigns relative scores to all nodes in the network based on the concept that connections to high-scoring nodes contribute more to the score of the node in question than equal connections to low-scoring nodes.

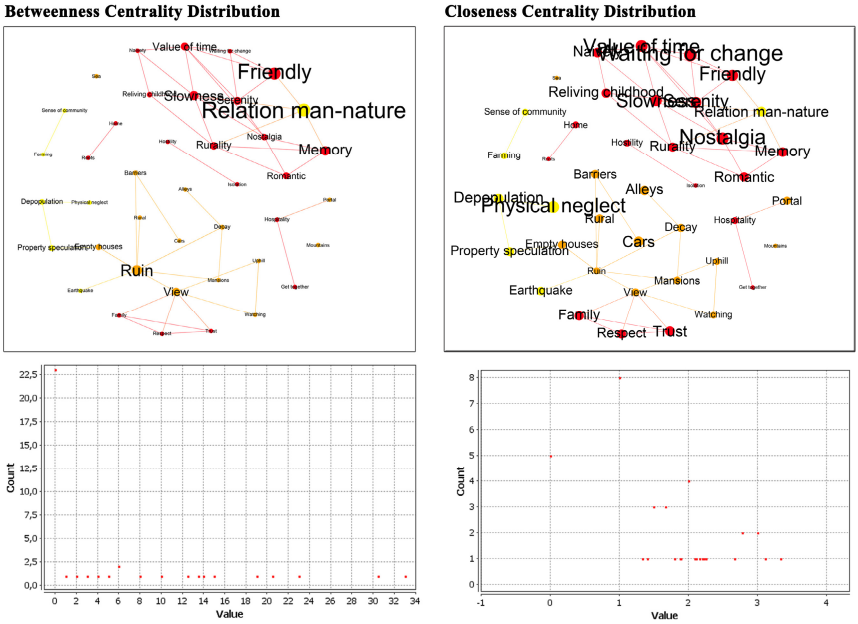

Fig. 4. Indicators: Betweenness and Centrality Distribution

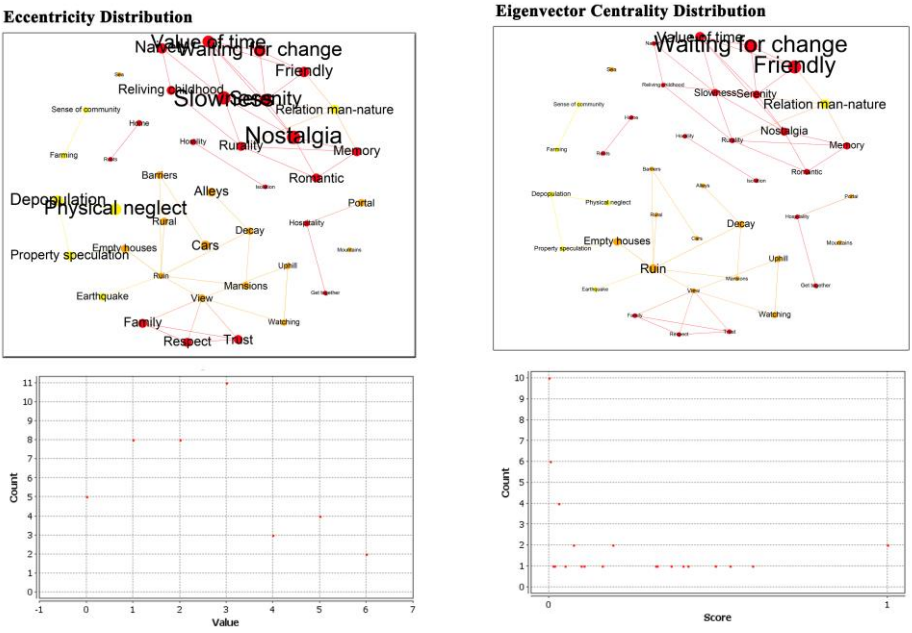

Fig. 5. Indicators: Eccentricity and Eigenvector Centrality

The above indicators take into account, in the calculation of the weight of each node, the relationships that it generates with the other nodes of the network.

In order to analyze the complex semantic network we used the software packages NodeXL and Gephi:

- NodeXL is a free, open-source SNA plug-in for use with Excel. It provides instant graphical representation of relationships of complex networked data, allowing collecting, analyze, and visualize a variety of networks. NodeXL is used to visualize the structure of conversations around specific topics. It is applied as an analytical tool in the social, information, and computer sciences as well as the focus of research in human computer interaction, data mining, and data visualization [22,23,24];
- Gephi is an open source software for graph and network analysis that works with complex data sets and produces valuable visual results. Gephi is a tool for Exploratory Data Analysis, able to exploring and understanding graphs: the user interacts with the representation, manipulate the structures, shapes and colors to reveal hidden properties. The goal is to support making hypothesis, intuitively discover patterns, isolates structure singularities or faults during data sourcing. It is a complementary tool to traditional statistics, as visual thinking with interactive interfaces [25].

The application of the two software was useful for detecting preferences coming to the relations between different values in the complex semantic network. The key words were included in the software taking into account the category of membership values (*forms*, *relationships* and *processes*), which are readable even in graphs in different colors (respectively red, orange and yellow). For each indicator we obtained a graph that shows:

- the identification of the main nodes;
- the interaction between nodes belonging to different classes of values;
- the isolation of some nodes.

These observations let finally to trace the relations between meanings and thus between different values, allowing a complex and dynamic reading of the information collected. Considering the selected indicators and the results of the analysis, it is possible underline that:

- About *Betweenness*, “friendly” (red color, *relationships* category) and “relation man-nature” (yellow color, *processes* category) are central nodes that interact, followed by “memory”, “slowness” and “value of time” (all red color). “Ruins” and “view” (orange color, *forms* category) are central too, but isolated respect to the others.
- About *Closeness centrality*, “waiting for change” and “nostalgia” are the nodes of the network that minimize the average distance, followed by “friendly”, “serenity”, “slowness” and “value of the time”. All of them are red and related to the *relationships* category. “Physical neglect” and “depopulation” (both yellow color) are the two other nodes related to the *processes* category.

- About *Eccentricity*, "nostalgia" and "slowness" are the main relevant nodes, followed by "waiting for change", "value of time", "friendly" and "serenity", with reference to the *relationships* category. All of them are of red color. In this case, too, "physical neglect" and "depopulation" (both yellow color) are the two other relevant nodes related to the *processes* category.
- About *Eigenvector centrality*, the nodes with more influence are "waiting for change", "friendly", followed by "value of the time". All of them are red and are part of the *relationships* category. "Relation man-nature" is the most relevant for the *processes* category (yellow color); "ruin", "empty houses" and "decay" (all orange color) are nodes of the *forms* category.

Therefore, we can identify the main relevant values that characterize the landscape of Castel Ruggero, considering the following groups:

1. "friendly", "waiting for change", "nostalgia" for the *relationships* category;
2. "ruins" for the *forms* category;
3. "relation man-nature", "physical neglect" and "depopulation" for the *processes* category.

According to the perceptions of insiders and outsiders, Castel Ruggero's landscape is expression of a network of values that make explicit the deep ties with the specificity of the context, but also the emotional dimension that derives from the cultural relationship with the places; they are not recognizable in measurable components and need an integrated approach to understanding intangible aspects.

4 Conclusions

The research of landscape values is, thus, a complex exercise that requires to investigate not only the meanings of the values, but also the relationships among them. This second stage of the study tests, therefore, the way the relations between meanings can increase the semantic domain of keywords, in order to better understanding the complex values and to express them by relating themselves to multiple categories of values.

The model adopted defines a systematic framework for understanding landscape values, and analyzing insiders and outsiders data and perceptions. The application of NodeXL and Gephi tools, according to the graph theory and network analysis, enables this information to be synthesized by capturing and locating key landscape-related values in a simulation of space and time.

The landscape framework provides a way of conceptualizing them by a structured approach of conceiving cultural values and linking them by a language based on interrelated key concepts. The model creates a basis for understanding, sharing and communicating landscape values. They also sketch out a theoretical structure that incorporates both qualitative and quantitative spatial significance.

In the further stages of the research, the complex values will be represented in the spatial dimension, reconsidering the places meanings. Indeed, the cultural values influence planning practice, it is necessary to be able to account for those values a

spatial sense. Landscape's features mapping is an inappropriate model, since it offers little to the understanding of cultural values, while the support of cognitive maps may well be highly informative.

Landscape, as an inclusive concept, allows to overcome the fundamental division between nature and culture, incorporating the idea that assessments of natural values are a cultural construct.

References

1. Stephenson, J.: The Cultural Values Model: An Integrated Approach to Values in Landscapes. Landscape and Urban Planning 84, 127–139 (2008)
2. Stephenson, J.: Values in Space and Time: A Framework for Understanding and Linking Multiple Cultural Values in Landscapes. PhD, Geography. Otago University, Dunedin, NZ (2005)
3. Gray, J.: A Rural Sense of Place: Intimate Experience in Planning a Countryside for Life. Planning: Theory & Practice 4(1), 93–96 (2003)
4. Hay, R.: A Rooted Sense of Place in Cross-Cultural Perspective. Canadian Geographic 42(3), 245–266 (1998)
5. Antrop, M.: Why Landscapes of the Past are Important for the Future. Landscape and Urban Planning 70(1-2), 21–34 (2005)
6. Cerreta, M., De Toro, P.: Urbanization Suitability Maps: A Dynamics Spatial Decision Support System for Sustainable Land Use. Earth System Dynamics 3(2), 157–171 (2012), http://www.earth-syst-dynam.net
7. Fusco Girard, L., Torre, C.M.: The Use of Ahp in a Multiactor Evaluation for Urban Development Programs: A case Study. In: Murgante, B., Gervasi, O., Misra, S., Nedjah, N., Rocha, A.M.A.C., Taniar, D., Apduhan, B.O. (eds.) ICCSA 2012, Part II. LNCS, vol. 7334, pp. 157–167. Springer, Heidelberg (2012)
8. Cerreta, M.: Thinking through Complex Values. In: Cerreta, M., Concilio, G., Monno, V. (eds.) Making Strategies in Spatial Planning, Knowledge and Values, vol. 9, pp. 381–404. Springer, Dordrecht (2010)
9. Cerreta, M., Diappi, L.: Adaptive Evaluations in Complex Contexts. Introduction. Scienze Regionali – Italian Journal of Regional Science 13, 5–22 (2014)
10. Cerreta, M., Poli, G.: A Complex Values Map of Marginal Urban Landscapes: An Experiment in Naples (Italy). International Journal of Agricultural and Environmental Information Systems 4, 41–62 (2013), http://www.igi-global.com
11. Perchinunno, P., Rotondo, F., Torre, C.M.: The Evidence of Links between Landscape and Economy in a Rural Park. International Journal of Agricultural and Environmental Information Systems 3(2), 72–85 (2012), http://www.igi-global.com
12. Montrone, S., Perchinunno, P., Torre, C.M.: Analysis of Positional Aspects in the Variation of Real Estate Values in an Italian Southern Metropolitan Area. In: Taniar, D., Gervasi, O., Murgante, B., Pardede, E., Apduhan, B.O. (eds.) ICCSA 2010, Part I. LNCS, vol. 6016, pp. 17–31. Springer, Heidelberg (2010)
13. Hayden, D.: The Power of Place. The MIT Press, Cambridge (1995)
14. Williams, R.: The Country and the City. Oxford University Press, New York (1973)
15. Johnston, R., Gregory, D., Pratt, G., Watts, M.: The Dictionary of Human Geography. Blackwell, Oxford (2000)
16. Thrift, N., Whatmore, S.: Cultural Geography: Critical Concepts in the Social Sciences. Routledge, London (2004)

17. Brown, G., Reed, P., Harris, C.: Testing a Place-based Theory for Environmental Evaluation: An Alaska Case Study. Applied Geography 22, 49–76 (2002)
18. Stephenson, J.: Many Perceptions, One Landscape. Landscape Review 11(2), 9–30 (2007)
19. Stephenson, J., Bauchop, H., Petchey, P.: Bannockburn Heritage Landscape Study. Department of Conservation, Wellington (2004)
20. Aldous, J.M., Wilson, R.J.: Graphs and Applications: An Introductory Approach. Springer, Dordrech (2000)
21. Wasserman, S., Faust, K.: Social Network Analysis: Methods and Applications. Structural Analysis in the Social Sciences. Cambridge University Press, Cambridge (2008)
22. Bonsignore, E.M., Dunne, C., Rotman, D., Smith, M., Capone, T., Hansen, D.L., Schneiderman, B.: First Steps to Netviz Nirvana: Evaluating Social Network Analysis with NodeXL. In: Proceedings of the 1st IEEE International Conference on Computational Science and Engineering, CSE, pp. 332–339 (2009)
23. Hansen, D.L., Schneiderman, B., Smith, M.: Analyzing Social Media Networks with NodeXL: Insights from a Connected World. Morgan Kaufmann, Burlington (2010)
24. Mendes Rodrigues, E., Milic-Frayling, N., Smith, M., Shneiderman, B., Hansen, D.: Group-In-a-Box Layout for Multi-faceted Analysis of Communities. In: Proceedings of the 3rd IEEE International Conference on Social Computing, CSE, pp. 354–362 (2011)
25. Bastian, M., Heymann, S., Jacomy, M.: Gephi: An Open Source Software for Exploring and Manipulating Networks. In: International AAAI Conference on Weblogs and Social Media, pp. 1–2 (2009), http://gephi.org