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**Linking community engagement and
ecosystem services assessment as a tool for the
rural landscape management**

**An applicative case for the Collemeluccio-
Montedimezzo Alto Molise Biosphere Reserve**



Angela Tavone

UNIVERSITY OF MOLISE
DEPARTMENT OF BIOSCIENCE AND TERRITORY



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Montedimezzo Alto Molise Biosphere Reserve**

Tutor:
Prof. Davide Marino

Ph. D. Coordinator:
Prof. Gabriella Stefania Scippa

Co-tutor:
Prof. Paolo Di Martino

Candidate:
Angela Tavone
Reg. Number: 143792

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To Ally, and to my family

Picture on the cover: Tavone A. – “San Domenico church in Carovilli countryside”
(2014)

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Tavone A. – “Cohabitation”. Molly Bog, Vermont (Fall 2013).

“Landscape is not merely the world we see, it is a construction, a composition of that world. Landscape is a way of seeing the world”.

Cosgrove D.E.

From *“Social formation and symbolic landscape”* (1984).

Introduction

Nowadays, the landscape issues are becoming actual always more, because we live in world that we are transforming so fast that sometimes we cannot recognize what we are surrounded by (or we do not reflect enough about its changes). And the landscape is the expression of this surrounding space: “actions and interactions of natural and human factors”, states the European Landscape Convention (ELC 2000), a continuous transformation that gives the dynamic character to the landscape. It is not possible to stop the changing landscape, but it is a civic duty to manage it, unless to destroy or degrade the matters and functions that can allow the natural and semi-natural ecosystems to work in balance. Yet, what it risks is also another component of the landscape if it is not well managed: the cultural values enclosed in the shapes, the social expressions, the traditions, the artifacts and the jobs, found in the landscape. “As perceived by people” the ELC still states by defining the landscape, because there is not landscape without a human perception of it.

The rural landscape is a special and, at the same time, challenging one to be managed in terms of both material and immaterial resources, and the possible risks are, for example: high productive pressure, cultural identity loss, pollution load made by agricultural practice, soil consumption, natural reforestation in consequence of the abandonment of marginal agriculture, fragmentation of landscape patches that compromises the high functionality of ecosystems and the conservation of biodiversity. For all and not exhaustive these threats potentially belonging to the rural landscape, important driving forces need to intervene: the social cohesion and the sense of place expressed by people who live the rural landscape, the renovation of social values by keeping alive the traditions and the aspirations of local communities, the planning of shared actions towards a sustainable use of the landscape, the inspiration of use the rural landscape as a special classroom for educating people to "cultivate plants and souls". The rural landscape is a big commingling of fragilities and potentialities that should be constantly balanced by an aware and integrated planning, where all the diverse beneficiaries are called to take care about it, for managing their own future well-being.

In this broad framework, the present thesis work moves around, with the main aim of analyzing how the community engagement and the ecosystem services (ES) assessment can be used for improving the management of the rural landscape.

For reaching this objective, the research starts from framing the main Italian and European address and regulatory systems of reference for the landscape management, specifically about the rural landscape, which is analyzed in its fragilities and potentialities in biophysical, economic and sociocultural terms. Linking the expert and local knowledge is a key step explored for building up an integrative approach for the rural landscape management (Chapter 1).

The community engagement is a priority to consider in the landscape management, because people who live and enjoy the landscape have the duty to understand how it is transforming and, in consequence of their needs and future perspectives, they have the possibility to decide in what direction orient the management actions. It should say that the “power of changing” needs to be led by a “civic awareness”. Hence, more attention needs to be given to the participation practices in the decision-making processes. There are many examples around the world that include the community engagement as a fundamental tool to reach, first, a common vision, and then to plan the actions for improving the conservation and/or the transformation of the landscape according to a shared intervention line. Case studies are shown from Europe, Italy and Vermont by focusing on the participative modalities and the reasons at the basis of the involvement: the community engagement, indeed, has not to be considered a finality, rather a mean (Chapter 2).

The involvement of stakeholders in the landscape management is important but it is not enough. Indeed, people’s actions for performing the landscape management have relevant responsibility for driving changes (and adding values at landscape) in terms of ecosystems functions, and, consequently, related services. Thus, a basic step for improving the landscape management is to increase and deepen the knowledge by assessing the ES. A broad overview of the ES approach is given, from global to local scale, by focusing the attention mostly on the important role played by the social perception of the landscape ES by stakeholders and how this knowledge can be integrated into

decision-making processes for improving the landscape management. For this purpose, a methodological “twofold approach” to include a framework of objective and subjective data aimed at an integrated and multidisciplinary landscape management is presented (Chapter 3).

Finally, an application of this proposed approach is shown in the area of “Collemeluccio-Montedimezzo Alto Molise” Biosphere Reserve, in Central-Southern Italy, recently enlarged by UNESCO. The research is mostly oriented to investigate the subjective data correlated to this landscape, in particular by analyzing the ES perception of different stakeholders, while the objective data are considered already available thanks to several studies and researches that have been carried on during the years. This application represents a first attempt that wants to put in practice a general and theoretical approach, which derives from the analysis of inputs and good examples reported in this thesis work (Chapter 4).

The “twofold approach” here proposed is thought to be flexible and applicable to any typology of decision-making process, at large or small scale, that aims the landscape management.

CHAPTER ONE

The landscape management



Minotti M. – “Shadows on the Biosphere Reserve landscape” (2012).

1. THE LANDSCAPE MANAGEMENT

1.1 Definitions and regulatory tools: an overview

Contents:

- Visions and definitions of landscape
- Origin and evolution of the landscape concept in the Italian and European regulatory system
- The landscape plan: objectives and functions for managing the landscape in a trans/multidisciplinary perspective

The first time someone wrote about the landscape in literature was the poet Francesco Petrarca, when in 1336 climbed the peak of Monte Ventoso, or Mont Ventoux, on the South-Western Alps in France (Küster 2010). All along the hiking, Petrarca was attracted by the natural phenomena, the mountains, the valleys, the river and the sea, whom shapes and beauty he interpreted according to his personal experience. Once on the peak, all these elements were too far away that he was not able to recognize the water flows, the sea waves, the single trees, nor the sparkly minerals on the rock walls. At that point, he realized that only when all the images rejoin in an overall view, then it is possible to recognize a landscape.

According to Petrarca's vision, the landscape is what a man perceives in his own environment, with which he is in relation; the visible things as well as the invisible ones, which the thought can build up, make the landscape. In the same way, the naturalist Alexander von Humboldt assumed that when a landscape is examined, it brings together all that is animate and inanimate (von Humboldt, 1998). The recognizing process of the landscape relationships might last long, even a whole life, and the impulse to start this process can be transmitted throughout generations, like the traditions. Continuously, new landscape relationships appear, but sometimes not the right importance is given to that, because the details analysis is often favored to the synthesis results, which presumes, moreover, to be found in different disciplines, even they are distant each other.

During the centuries, the landscape concept has been continued to keep a strong connection with the aesthetic and perceptive dimension, also since the beginning of XX century and over. Indeed, in the Italian tradition, the landscape notion has been tied with the conservation of cultural heritage (Settis 2010), and the law promoted by Benedetto Croce in the twenties (National Law 778/1922 about the preservation of natural beauties and remarkable historical buildings) defined the landscape as the material and visible representation of the homeland (Ferrara et al. 2007). The consideration of shapes perception and the beauty (Romani 1994) is the meaning found inside a subsequent regulation, the N.L. 1497/1939 about the protection of natural beauties, where there is not the word landscape, but its notion is assimilable to “beauties as a whole”. Moreover, both the laws spoke about regulatory plans or territorial plans to be design to avoid that a detrimental use of certain areas compromises those beauties. Even the Italian Constitution in 1946 exalted the landscape notion in the Art. 9, associating it to the historical and artistic heritage and subjected it to a protection regime. This means that the landscape protection is an Italian fundamental principle and that the Country territory, with its environmental and cultural elements, is a constitutional value itself (Sandroni 2012). The landscape restriction is the main tool contained in the “Galasso Law” (N.L. 431/1985 about the protection of areas of particular environmental interest), extended its action to many broad landscape categories (such as cost areas, mountains, rivers and streams, volcanos, etc.). Even if, from one side, the N.L. 431/1985 included the necessity to protect a wide portion of the Country territory through restrictions and plannings, from the other side it presented some problems and uncertainties about the attribution of multiple competencies amongst institutions regarding the landscape management (Agnoletti 2010).

The growing interest and necessity for managing the landscape raised across the decades since the important milestone at European level, with the European Landscape Convention (ELC) signed on October 20, 2000 in Florence by 45 EU Member States. The ELC arrived in a moment of high consciousness matured by the Governments to understand the direction through which advising institutions and populations for managing their territories in evolution, giving some tools and recommendations for leading people to enjoy a landscape of quality and encouraging them to have an active

role in the landscape transformation (Priore 2005). Indeed, since its preamble, the ELC states that “the landscape is a key element of individual and social well-being and that its protection, management and planning entail rights and responsibilities for everyone” (Council of Europe 2000). The well-known definition of landscape by ELC points out that the landscape is not simply a background where the man is only a spectator, but it represents the entire scene within which the man acts as a protagonist (Agnoletti 2010). Indeed, by definition “landscape means an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors” (Council of Europe 2000, art. 1). Therefore, the different landscapes whom give shape to the European territory are the contexts where populations experiment the representation of their own identities and evolutions. Definitely, the ELC pushes State authorities to make the local entities responsible about the landscape values and, simultaneously, to develop activities to raise awareness in people regarding these themes. In this way, a social request of (a quality) landscape is possible to build up, of which the local and regional authorities must take charge so to trigger virtuous circle aimed to the outbreak of a real widespread consciousness of the landscape (Priore 2005). The ELC compels the Member States of Council of Europe whom ratify the Convention (until today they are 38¹) to develop political programs specifically regarding the landscape, with activities of outreach, training and education aimed at making actors, both private and public, responsible for their own actions concerning the landscape. In this sense, this is a process of democratization of the landscape.

The ELC has imprinted an important turning point to the landscape policies under different points of view: first of all, the complex meaning attributed to the landscape as an expression of the common cultural heritage and the foundation of local identities; the recognition, even juridical, of landscape values to the whole territory (indeed, the ELC indicates three broad different kinds of landscape - the outstanding landscapes, the everyday ones, as well as the degraded landscapes – providing three different approaches

¹ <http://conventions.coe.int/Treaty/Commun/ChercheSig.asp?NT=176&CM=8&DF=&CL=ENG> [Last consultation: 02-28-2015].

for their management, but each of them is worthy of being considered always a landscape); the populations' leading role to determine the choices for protection and valorization of their landscape through their expectations and perceptions. An innovative management of the landscape, with its natural and cultural heritage, needs some specific measures of protection, but also an articulated set of policies, as ELC recommends, assessing and dealing with different problems regarding tangible and intangible values, risks and threats of the landscape (Gambino 2013).

The strong resonance of ELC in Italy was conveyed in the Agreement between State and Regions regarding the landscape in 2001. The Agreement aim was to define the activities of both the Minister of Cultural Heritage and the Regions, consistently with the ELC, about the landscape planning and, more in general, the collaboration processes amongst the different public administrations about these topics. That Agreement was also the result of such an awareness that the landscape is also a national economic resource and its protection can lead the Country towards the sustainable development objectives.

After this step, the national law went towards the most recent regulatory piece regarding the landscape, with the Code of Cultural Heritage and Landscape – hereafter, the Code - (Legislative Decree 42/2004 and its subsequent L.D. 156/2006 and 157/2006, which modified and integrated the Code in the part regarding the cultural heritage and the landscape, in consequence of the Italian ratification of the ELC, occurred in that year). The landscape definition given by the Code accepts the ELC one. Indeed, in the article 131 of the Code, landscape means “portions of territory which distinctive characters derive from nature, human history and their own mutual interrelations” (art. 131, paragraph 1, as modified by L.D. 157/2006). “The protection and valorization of the landscape safeguard its values as manifestations of perceptible identities” (art. 131, paragraph 2, as modified by L.D. 157/2006). Even considering the coherence between the Code and the ELC in terms of landscape definitions, the ELC specifies the necessity to include the landscape inside the urban and territorial policies, implying important repercussions on the territory governance; this is not completely covered by the Code, because it seems attributing the aim of implementing values, objectives and rules of the territory only to

the landscape planning, even though in connection with other plans (such as: the regional plan for the forest sector or the rural development, the territorial plan for the coordination of the provinces, the municipal or intermunicipal plan, etc.) (Balletti and Soppa 2005). Just about the measures of coordination with other territorial planning tools found in the Code, the national and regional programs regarding the landscape management need to be designed for achieving the economic development. This means that the protection and valorization of the heritage go towards a programmatic meaning, not only towards a binding one, focusing the attention, in this way, also on the investment of resources for incentivizing the implementation of projects and best practices in this field (Agnoletti 2010). Furthermore, as the Code recalls, the public administrations need to work for cooperating in the planning sector and to implement training and educative activities, as the ELC recommends.

The Code has introduced the obligation for the regional authorities to draw up the landscape plans together with the Ministry of Cultural Heritage, recognizing in this way the inescapable necessity not only to protect but also to manage and valorize the areas characterized by strong landscape values, and the important requirement of healing the too much long conflict between State and Regions about the landscape matter. Therefore, the landscape plan is considered the fundamental and reference tool for the landscape policies in Italy. Each regional authority designs the landscape plan, which contains a set of actions for recovering and valorizing the territory, then to be proposed to the local institutional levels (sector policies). Usually this conveys into: interventions on soil protection, recovery of environmental systems and historical and cultural heritage, the establishment of parks and protected areas aimed at the development of equipment and routes for the environment and landscape fruition. More rarely the plans set in motion direct actions of conservation, enhancement and requalification, generally subject to the adoption of subsequent projects or programs, which constitute tools for different legal nature of implementation. The approval procedures of the landscape plans imply the institutional consultation, the participation of stakeholders and actors involved in the protection of “widespread interests” of the landscape.

Moreover, the landscape plan, starting from the recognition of the landscape assets and, therefore, the existing restrictions, has the power to strengthen them, expand them and to set up new ones, while it cannot reduce or, worse, eliminate them in any way. The Code prescribes that the landscape plan makes the recognition of all the landscape assets, which means essentially the analysis that allows verifying the real state of the intrinsic values of a certain landscape, with respect to the assessment made at the time the decision to protect it. Hence, it derives the provision of protection measures, the processing conditions of use, but also the evaluation of possible expansion of the restriction (Sandroni 2012).

According to Gambino (2013), because a landscape plan can contribute to implement effective management policies of the territory, it must follow two prerequisites:

- a) That the plan expresses an authentic "landscape project", the result of a continuing process of drafting, participation and social sharing, based on the comparison explicit and transparent the interests involved; to this purpose, it is crucial that local communities and other stakeholders are considered not mere spectators, but actors and protagonists of the project, sharing the responsibility.
- b) That the landscape project articulates at all levels of the fundamental territorial government, from the regional, provincial and municipal ones, until to the operational projects, triggering virtuous processes of trans-scalar interaction.

This means that the landscape plan needs to be a tool able to connect the planning and regulatory aspects to the management ones (which should be as much flexible as possible), becoming a sort of "container of projects", which have to be consistent with the plan itself (Balletti and Soppa 2005).

The set of territorial policies can influence or determine the unceasing transformation of the environment and the landscape at different levels and in different sectors (such as soil conservation, water management, agriculture, forestry management, urban planning, engineering of the territory, culture, training, social communication, etc.) (Gambino 2013). This means that it is a priority to considering the landscape always under

its multidisciplinary light. Indeed, landscape is the visible expression of both the environmental and the cultural systems, and because they are so integrated each other, it needs to study and interpret the landscape phenomena with an interdisciplinary regime. Moreover, the transdisciplinarity extends the interdisciplinarity concept, because the former include the participation of and amongst actors from different competencies. Indeed, in the process of sharing, aimed at the landscape management, generally not only the bearers of expert knowledge are called to participate, but also the actors of the territory, from policy makers to the inhabitants (Gissi 2011). Often this goal is hard to achieve, mostly due to the different languages and interpretive paradigms holding by all the disciplines involved in the landscape management, like engineering, urbanistic architecture, economy and social science, and the landscape ecology. Just the latter is remarkable to be mentioned regarding its important role in the research and reflection about the landscape. The aim of landscape ecology is to understand the existing ties amongst structures and functions of landscape and, in particular, to deepen the multi-spatial and multi-temporal research to be able to give answers to the processes, both planned and under way, and to build up an indicative and proactive methodology, through analyzing the changes, able to anticipate future approximate scenarios. The landscape ecology can be considered, with its integrated and transdisciplinary vision of dynamisms of natural and human matrix, the conceptual and technical foundation for a reformulation of the spatial and urban planning, in the sense of those environmental and landscape needs which require, for their importance, a growing consideration (Balletti and Soppa 2005).

There are two different levels of problem concerning the integrated management of the environmental and landscape resources: the first one regards how to modulate the integration amongst the disciplines connected to the territory and, then, amongst expert knowledge and widespread one; a second issue concerns how to introduce and integrate this new knowledge with the governance of the territory (Gissi 2011). Therefore, the communication difficulties amongst the sectors involved in the landscape planning are crucial and need to be overcome for building up a shared framework of knowledge.

1.2 The rural landscape in Italy: fragilities and potentialities

Contents:

- Why addressing the rural landscape in this research: ecological, socio-cultural and economic factors that shape this type of landscape
- The Italian and European policies for managing the rural landscape through the planning systems
- Suggestions from two research projects aimed at improving the rural landscape management
- The rural landscape is always affected by transformations: an overview on its main fragilities and opportunities factors

1.2.1 Why the rural landscape

The Italian surface is covered by two main landscape structures that are the agricultural matrix (55% of the total surface) and the forests and semi-natural matrix (40%); the rest is made by a mix of composite landscape with a transition structure between the agricultural and natural matrix, by wetlands, suburban and urban landscapes (5%) (Agnoletti, 2010). This means that, at national scale, the agricultural landscape is a physically continuous expanse, while the forests and the semi-natural environments constitute the mountainous “connective bone structure” of the peninsula. Indeed, historically speaking, the Italian landscape evolved mostly due to the agricultural techniques and practices coming in succession along the centuries and millennia, through a long process of transformation and adaptation to a hard natural environment, mostly mountainous and hilly.

Here, it is going to take into consideration the rural landscape not only because it is the main kind of landscape in Italy, but also for many other reasons: it is a highly rate changing landscape and often the transformations are not accompanied with a well-structured planning (Agnoletti 2010). It is the most productive landscape in terms of goods and services for humans (such as food, recreation, energy, water supply, etc.) and, therefore, it is the most used kind of landscape, often with no care about the exploitation consequences of its resources (Roura-Pascual et al. 2005; Schneeberger et al. 2007; Zomeni et al. 2008). It is the caretaker of many cultural values, because along the rural

landscapes, the strongest socio-economic systems evolved across the history, and these values are at risk due of fragility factors, which affect the rural landscape (Dezio and Marino 2014). Despite that, it is also characterized by many potentialities regarding the implementation of the sustainable development, the biodiversity conservation and the quality of life (Barbera et al. 2014).

First, it needs a distinction between the agricultural and rural landscape definitions. Emilio Sereni (1961) used to define the agricultural landscape as “that shape the man, in the course and for the purpose of its agricultural production, consciously and systematically gives to the rural landscape²”. Indeed, it refers to the spaces of production, rather the rural landscape definition – often used as a synonymous of agricultural landscape – has a broader meaning and it comprehends the settlements, infrastructures, the woods and the watersheds (Barbera et al. 2014).

The rural landscape is shaped by different kind of processes, which are social and economic, ecologic and environmental, political and cultural; each of them is driven by different factors.

The socio-economic factors are: the socio-demographic dynamics connected to the population’s aging, the changes in the social structure al local level, the abandonment of rural towns and the migration processes; mostly the latter two factors determine the marginalization of the rural landscape. Moreover, the big urban areas exert an attractor effect towards the orientation of the productive and social processes. The restructuring of land, the productive specialization and intensification are other important driven factors for shaping the rural landscape in the direction of trivialization.

The ecological and environmental factors are: the steady increase in the share of naturalization and the extending woodland; the pollution of surface water, groundwater and air, as well as the waste accumulation; the soil erosion; the climate change effects at midterm.

² Translated from the original sentence: “quella forma che l’uomo, nel corso e ai fini delle sue attività produttive agricole, coscientemente e sistematicamente imprime al paesaggio rurale.” (Sereni 1961: 29).

The political and cultural effects able to shape the rural landscape are: the role of the supporting tools to the incoming and of the farms for guiding production processes and the cultivating choices; the pressure of urbanization, in some cases linked to a chaotic infrastructural development; the inadequacy of the tools that fit the landscape in the policies of regional planning, in the environmental management and in the protection of public property, even with respect to investment in research and training. Another one is the cultural attitude, sometimes contradictory, that manifests itself on the one hand, in increasing demands to preserve the landscape, and on the other party, in harmful behaviors towards it.

All these factors act in guiding the process of transformation of the rural landscape.

It has been demonstrated that the numerosity of natural and seminatural habitats in the rural landscape is correlated to the richness of the species and, therefore, the reduction of their number or their disappearance is an indicator of biodiversity loss (Billetter et al 2008). The high ecosystemic biodiversity characterizing the rural landscape (Barbera et al. 2014) is expressed through a composite mosaic of cultivation tiles (according to the land use), connected by ecological corridors (such as, water courses, tree lines, hedgerows, dry stone walls, etc.) which link them each other and, by allowing the interactions amongst species, energy and material, and they ensure the productive and ecological efficiency. Moreover, a high level of animal and plant biodiversity is not only an asset in itself, but also a prerequisite for the functionality of ecosystems. In fact, biodiversity also carries ecological services such as the maintenance of the nutrient cycle, the regulation of microclimate and the local hydrological assets, the suppression of harmful organisms, the detoxification of contaminants (Altieri 1999). Biodiversity also allows the maintenance of ecosystem connectivity of the landscape, which is a further ecological function (Forman 1995).

Another important asset characterizes the rural landscape: the multifunctionality. It derives from the concept that the rural land is able to produce not only agricultural goods, but also environmental functions, such as the biodiversity, the hydric resources, the soil fertility, and cultural values, like people's identity, aesthetic and spiritual values. In this sense, the agrarian policies recognize all these aspects attributed to the rural

landscape as a public good and, as consequence, drive their measures to increase the farms incoming (an example is the *agriturismo*). Still, in terms of policies in favor of rural landscape, also the biodiversity finds an important position for its protection, especially through the action of farmers, seen as “biodiversity’s caretakers” of the agri-forest ecosystems. In this perspective, a Life Project called “DINAMO³” was co-financed by EU in the rural landscape of Lower Molise, in Central-South of Italy. The project, coordinated by the University of Molise, aimed at the protection of biodiversity through direct actions mainly made by the farmers voluntarily, for instance the installation of nests in their farmlands to allow the Red kite (*Milvus Milvus*) and the European roller (*Coracia garrulus*) to go back for nesting in the area, or the restoration of natural vegetation to create extended habitats in agricultural environment to encourage the presence of birds and reptiles species (also fostering the connection amongst the farmlands and the Natura 2000 sites). In addition, also some public areas managed by the municipalities involved in the project were reserved to these kind of actions for increasing the biodiversity. That project was a good model for demonstrating that the multifunctional and productive activities of the rural landscape reconcilable with the protection of biodiversity and the direct involvement of private and public entities are possible and successful.

Normally, when running think the landscape in general, it is rarely associated with the economic aspects. This is because, commonly, the man connects the idea of landscape (also the rural one) mostly to its aesthetic and spiritual values rather of its monetary features (Tempesta 2011). What it lacks is a broader concept of the potential benefits that the rural landscape can represent for the society.

Economically speaking, the landscape can be considered a pure public good, for which, in the absence of the principles of excludability and rivalry in consumption, it is not possible a market formation. Obviously, this does not mean the landscape cannot have a value, but it may not be in any case the subject of production for mercantile purposes from a private, and it will not have a price (Tempesta 1997). Moreover, the landscape is also an externality (positive or negative) of the anthropic activities and, specifically for the

³ DINAMO means “Increasing endangered bioDiversity iN Agricultural and semi-natural areas: innovative Management mOdel”. For more insights about the project: <http://www.life-dinamo.it/>

rural landscape, of the agri-forestry-pastoral activities. The consequence is that the quality of the rural landscape does not depend on an intentional intervention of a farmer who works only for getting an economic profit, but it is properly an external effect, not programmed by his own activity. For example, the conservation of a historical rural landscape represents a positive externality, because the farmer does not receive a remuneration for the landscape advantages he contributed to produce for the collectivity, but only for the goods he is able to deliver to the market. The opposite situation is the case of the negative externality: in the same example, the farmer makes to burden on the collectivity the cost (which means the loss of quality landscape) that he is not supposed to reimburse to the citizens.

Thus, there is a discrepancy between the mercantile and social values regarding the rural landscape, and, sometimes also between perceived and real values, that can cause the disappearance of historical landscapes or their decline. Bringing back the previous subject as an example, the farmer, as an entrepreneur, would gain the maximum profit from his own work and rural land. If a reduction of the profitability from the cultivation occurs and if the productive factors become less remunerative than other possible jobs to run, he will have few choices: he can stop cultivating or he can implement productive techniques that allow him to get appropriate profit margins. In the first hypothesis, the abandonment of production will happen: in the second hypothesis, the introduction of new productive techniques and the implementation of new changes in land will occur. In both cases, the result will be the transformation of the landscape as inherited from the past.

To avoid the incapacity of the market to guarantee an adequate level of quality landscape there are two main ways to take, even not exclusive: the imposition of landscape restrictions and the providing of grants (Tempesta 2011). The landscape restrictions imply costs for individuals in terms of lost income and they determine an insufficient use of the productive factors, therefore the necessity to find new and more profitable jobs. The restrictions are conceived as an acceptable tool socially only if their incidence on the farmer's income is not so much high. In the opposite case, they can

encourage phenomena of land abandonment, increasing, in this way, the decline of quality landscape, rather than stopping it.

Grants are provided by public entities, mostly from European Union and, sometimes, from national level, but often they are insufficient or hard to obtain. To avoid these problems, there is the possibility to carry out volunteer instruments aimed at the rural landscape conservation without a public intervention (Reho 2006; Marangon 2006). One of the most effective example in this direction is the rural tourism, because if it is linked in some way to the quality of landscape, the entrepreneurs, aware of the tourists' preferences, would work voluntary for preserving that rural landscape. In another case, while the landscape is perceived as a quality indicator from the consumers of a typical agricultural product, its conservation would guarantee higher prices and higher profitability for farmers' advantage. However, these opportunities often find obstacles at operational level. Indeed, in the rural tourism the costs of landscape conservation burden on all farmers of an area indistinctly, while the advantages are a prerogative of only few farms involved in selling services to tourists.

In synthesis and in the economic perspective, these elements belong to the rural landscape: the primary production of the resources; the ecological complexity starting from the ecosystemic complexity in the mixed farming; the valorization of the environmental resources at local scale, that is essential for the self-reproduction of the domesticated and wild species; the hydrogeological safeguard through the management of the woods, terracing and streams; the environmental cycle closure at local scale regarding the food supply (such as short chains between the producer and consumer), the waste (such as the synergic association between the breeding and the cultivation) and the water (low energy-consumption cultivar, and the choice of traditional cultivar better related with the local climate features); typical products produced in typical landscape, strongly linked with the food quality; the cultural identity of places in terms of mutual aid and non-monetary and supportive actions, which are typical of community relationships in the civic customs. According to an overall view, the rural landscape is a system that requires quality (e.g. in the sustainable use of resources and in the productive systems)

and, at the same time, demonstrates quality (e.g. in the aesthetic values and in the ecological complexity).

There is another remarkable aspect regarding the rural landscape, which is worth to underline: there are some compositional elements, which recall an innate perception of the man, dating back to the human kind evolution. Indeed, the visual perception has had a fundamental function from an ecological point of view: in the environment where the human being spent the majority of its evolutionary phase, the African savanna, only a precious perception of the external environment could give to individuals a chance to survive. Therefore, the ways of visual perceiving the environment, and so the landscape, are an essential component of the genetic heritage as it has been selected in millions of years (Tempesta 2011). Some decades ago, Appleton (1975) indicated that a pleasant landscape is made by those elements that make an environment favorable to survival. These elements, typical of African Savanna, are scattered trees, woods alternated to open spaces, small streams and curvilinear profiles of the ground. These characteristics are assimilable to the ones that it can be found in the rural landscape; that is why this kind of landscape is mostly perceived aesthetically beautiful and relaxing from people. This instinctive component of the landscape perception is connected with a sense of safety that a well-known environment (since millions of years) conveys to people.

There is also a social component of the landscape perception, which is related to direct capacity of man to modify the environment for his own living and for his community's too. The environment transformation is one of the processes through which a social group affirms its own identity and, as consequence, all the signs and symbols belonging to that landscape will allow the cultural and social stability of the collectivity or the group that has built up that landscape (Costonis 1982). In this perspective, considering the historical, social and economic processes characterizing the rural landscape, intrinsically it has strong cultural and identity values, which should be valorized and protected.

A right understanding of whom are the values of the rural landscape is a basic element of a good definition of effective and locally shared territorial policies.

Just in terms of regulation, the Code, which has been discussed above, and its planning instruments can have important potentialities towards the rural lands, because they refer to the whole territory: in this way, the agricultural areas turned from not interesting place to be planned (before the entry into force of the Code), excepted for some “excellent goods” already indicated to be protected, into strategic components and “connective tissue” for a new landscape planning. However, the Code does not consider the rural landscape as a real category, and this implies, under a binding point of view, that a wood is always a wood, even though someone decides to substitute a centennial chestnuts wood with a coniferous one, because the latter is more productive for industrial purposes. This is the evident limit of a legislation that covers the environmental heritage, but not specifically the rural landscape (Agnoletti 2010).

In the last twenty years, the general interest for the landscape issues grew, because the need of changing the economy models only focused on the production and the industrialization started to evolve. Indeed, the conservation and valorization of the landscape, especially the traditional and multifunctional one, have entered in the regulatory systems, both European and national one (the already cited ELC, and the UNESCO policy regarding the “Cultural landscapes⁴”, put into effect few decades before the ELC). Even the Community Agrarian Policy (CAP) has pointed out, along its history, the importance of taking care about the environment and its functions. Then the landscape with its valorization became progressively significant, especially in the presence of a multifunctional agriculture (Barbera et al. 2014). The Good Agronomic Environmental Conditions foreseen in the CAP concern the protection of the agri-forest landscapes, encouraging the keeping of diversification elements of the rural landscape, such as hedgerows, ponds, ditches, trees in rows, field edges, etc. Going downscaling in the agrarian policies, the most recent National Plans for Development include specific agri-environmental measures aimed at diversifying the cropping systems and, as consequence, also the landscape mosaic. Consistently, the Rural Plans for Development applied at

⁴ “Cultural landscapes are cultural properties and represent the “combined works of nature and of man” designated in Article 1 of the Convention. They are illustrative of the evolution of human society and settlement over time, under the influence of the physical constraints and/or opportunities presented by their natural environment and of successive social, economic and cultural forces, both external and internal” (UNESCO WHC 2013).

regional scale contain several measures regarding the strong connection amongst the agriculture and forest sectors with the landscape protection.

All actions and interventions delineated by the agricultural and environmental policies in the European Union, which relate directly or indirectly to the rural world, cannot disregard the use of appropriate tools for multisectorial and multiscale planning, involving specifically socio-economic, historical, cultural and environmental issues. In this context, the concept of landscape, especially the rural landscape, can be a key link and summary for a true integrated planning.

1.2.2 A special issue: the historical and traditional rural landscapes

Beyond the European and national agrarian policies, it does not exist a unanimously recognized method to identify, inventory and characterize the rural landscapes (and the landscapes in general) in descriptive, multidisciplinary and multiscale terms (Barbera et al. 2014).

In front of this gap, an Italian research project, still in course, finds a niche by implementing a method to read, understand and interpret the traditional agrarian landscapes (PAT⁵) in the contemporaneity, identifying the compositional elements. It is a PRIN⁶ project called “The traditional agrarian landscapes of Italian agriculture: definition of an interpretive, multidisciplinary and multiscale model aimed at the planning and management of land”. The PAT can be defined as those landscapes present in a certain territory since long time and are stabilized or are evolving slowly in time (Marino and Cavallo 2010). This means that the PAT are the expression of specific socio-economic systems, which occurred to create them and keep them as they are. The method elaborated along the research project has an innovative component, because it comprehends historical and socio-economic analysis to understand the landscape evolution (from around sixty years ago till today), the anthropic choices, the meaning

⁵ PAT is the Italian acronym for “Paesaggi Agrari Tradizionali”, which means traditional agrarian landscapes.

⁶ PRIN means “Progetto di Ricerca di Interesse Nazionale” (Research Project of National Interest) and it is financed by the Italian Ministry of Education, University and Research.

progressively attributed to the landscape and which role all these information can play in the territorial policies.

These landscapes are characterized by the “traditional” condition: it can be found not only in the shape of an agrarian landscape, but also in the conservation of its (traditional) functions. Therefore, the land use and the historical persistency must be considered together with the presence (and, again, the persistency) of such environmental, social and economic functions to be defined traditional landscape. This is because the PAT have got a strong coevolutionary dynamic between the social project of the farmer and the natural system constraints where he deals with; it is a context where the maximum integration amongst human activities and natural factors occurs, and this determines relations of equilibrium and exchange in ecological, socioeconomic and cultural terms. According to Farina et al. (2003), the PAT are one of the most complex integration models amongst anthropic activities and nature, because the use of resources through the agri-forestry-pastoral practices is happened with technologies aimed at the biocenotic conservation.

The PAT model allows to read and understand the transformation processes of the agrarian landscape through three dimensions: complexity, connection and resiliency; each of them is declinable in the environmental, social, economic and settlement systems (Cavallo and Marino⁷, in Barbera et al. 2014).

Indeed, the traditional agricultural landscapes play a crucial role in the maintenance of biological complexity that is grounded in their own constituent characters or in the management techniques, which are the base of PAT preservation. The extraordinary complexity of shapes and structures that characterize the PAT is the prerequisite for the conservation of a rich biocenotic diversity expressed in species richness, either spontaneous or cultivated, in the genetic variability of cultivated lands. These features are visible in the complexity of land uses that often coexist in confined spaces of mixed cultivation in the strict sense or in the mixed farming spaces (cultivated and natural areas)

⁷ Marino D., Cavallo A. – Lo studio delle trasformazioni del paesaggio agrario: un modello interpretative: 37-46.

and in the complexity of the environmental mosaic. Furthermore, the management of PAT, characterized by a low input technology, allows the conservation of animal biodiversity, instead strongly disturbed in the intensive agricultural systems.

In the PAT model, the connection is taken in reference of its ecological, economic and social values. The opposite of connection is fragmentation and in the landscape ecology it means a process mainly connected to the man's action and defined as a mechanism through which an homogeneous land cover is divided into separated and/or removed parts (Farina 2001). In the research project, the connection dimension is useful to analyze the transformation processes occurred in the last fifty years and the deep modifications determined by the land use changes, which generated alterations in the traditional landscape matrix, reducing it in spots increasingly scarce and unconnected with the surrounding tissue. In this sense, the connection concept is extended from the environmental framework to the structural alterations of the landscape, investigating the landscape fragmentation as a complex modification, responsible of negative effects not only on habitats and animal and plant populations, but also on environmental functions, which are important for the human ecology, the historical permanencies and the morphological articulation of the landscape (Olivieri 2004).

The other fundamental dimension analyzed in the PRIN project about PAT is the resilience that is the capacity of an ecosystem to restore the equilibrium condition after an external disturb or intervention (Evans 2011; Walker et al. 2004). In the PRIN project, the resilience concept is useful to examine the relations amongst the agrarian landscape considered, the internal and external pressures on it and the variations of the physical and economic space borders of that landscape, identifying at the same time the changing factors. The PAT transformation processes are determined by profound changes in the land use and by its settlement structure occurred in the second half of the twentieth century. These transformations are largely made towards a progressive impoverishment of the forms and structures complexity of the landscape, the reduction of ecological and social functions, as well as a simplification of the production processes (Marino and Cavallo, in Barbera et al. 2014). Where this process has not happened, the persistence of traditional characters of the agrarian landscape can be identified, and, to be such, they

have to be complex and resilient. Therefore, the resilience becomes a proxy of the sustainability of natural and social systems. More generally, it expresses what the Anglo-Saxons call “capacity”, which means the intensity evaluation of the change that a landscape can suffer with no negative effects (Swanwick and Land Use Consultants 2002).

According to the PRIN project vision, the agrarian landscape is a matter of territory project (Marino and Cavallo 2011). Looking at the agrarian landscape means to conceive the space as a physical entity with specific socio-economic, geomorphological, agri-forest, environmental and ecological characteristics, to be investigated as resources for the city and the man, but it is also seen as a lived and perceived space endowed by shapes and meanings that can go beyond its own physical concreteness, which is also an inspirational motif of the ELC.

Under the light of the PRIN project, the attention to PAT in their shapes and meanings assume today a strategic role in the future management of agricultural systems, because one of the most important contemporary challenges is the identification of productive models in which the agronomic techniques can coexist with technological innovation, the environmental protection and its resources, and the respect for the natural and cultural values, by making them an integral part of the development of the various production chains (Biasi⁸, in Barbera et al. 2014). Greater attention to the enhancement of traditional agricultural landscapes can lead to the achievement of this goal, but also to improving the quality of the rural environment and thus the quality of life of those who live it or, for example, who are living it with the experience of tourism.

Another remarkable research project in Italy moved its steps from the necessity to compensate the lack of criteria for evaluating the influence of anthropogenic and temporal dynamics on the transformation of the rural landscape, mainly to understand the integrity level of the historical landscape. The methodology called VASA⁹ was developed during the research project for the enhancement of the monitoring system of

⁸ Biasi R. – Il PAT: caratteri generali ed evoluzione del concetto: 25-28.

⁹ VASA is the Italian acronym of “*Valutazione Storico Ambientale*”, which means historical and environmental evaluation.

the Tuscan landscape (Foster et al. 1998; Agnoletti and Paci 1999; Agnoletti 2002), and it is applicable to all the territories for which aerial photographs series or other historical documents are available, making it possible to reconstruct the evolution of land uses. Indeed, the land use is the base unit for the analysis, because the landscape is a specific area that can be considered as a mosaic composed of contiguous tiles, each one characterized by a different land use. In this perspective, the land use becomes, therefore, the basic element of the landscape, which is then described and assessed according to the characteristics of the overall structure and the internal structure of that mosaic.

The Italian Ministry of Agricultural, Food and Forest Policies financed the project, in which many universities and research institutes were involved, because there was the need to analyze and better understand the role and the meaning of the historical and cultural factors, in relation with the biodiversity rate, of the semi-natural systems, where the man is too often put only under a negative light as a degradative or disturbance factor. Thus, the VASA assessment approach is particularly suitable to a vision of sustainability in which ecological factors are a functional support to the interpretation of the territories in which the man is the main actor, through a dynamic multi-temporal model based on comparative assessments and specific analysis tools.

The evolution of this research project went in the direction of drawing up a Catalog of the historical rural landscapes in Italy (Agnoletti 2011), aimed at laying the foundations for recognizing, conserving and managing in a dynamic way the historical landscapes and the traditional practices in the face of the economic globalization, the climate changes and the inappropriate policies passed across the last decades. Indeed, in Italy still there is a big heritage of rural landscapes formed during millennia that, even they are continuing their evolution process, conserve evident proofs of their historical origin, still keeping an active role in the society and economy. Those landscapes are indissolubly connected to the traditional¹⁰ practices maintained and transmitted throughout generations of

¹⁰ According to the author (Agnoletti), the word "traditional" refers to those landscape already existed before the industrialization of the agricultural sector, formed by the shapes of properties and the cultivation techniques of agricultural and forest activities.

producers: farmers, shepherds and woodcutters. These are complex systems based on ingenious and varied techniques that provided an important contribution to the construction and maintenance of the Italian historical, cultural and natural heritage, representing the continuous adaptation to harsh environmental conditions, providing multiple products and services, contributing to the quality of life and producing landscapes of great beauty. The landscape heritage, the stratification of knowledge and experience related to traditional practices are key assets that must be protected.

However, multiple pressures force manufacturers to innovate agricultural techniques, often leading to unsustainable practices, the depletion of natural resources, the decline in productivity and the excessive specialization. This poses serious risks for the conservation of this economic, cultural and environmental resources, which constitute the traditional landscape, not only by interrupting the knowledge transmission necessary for its maintenance, but also leading to the socio-economic destabilization of the rural areas and the loss of competitiveness of the Italian agriculture. In this sense, the Catalog wants to testify not only the importance of the landscape as one of the historically most representative expressions of cultural identity of the Country, given the prevalence of rural civilization in the history of Italy, but also the universal value of the Italian landscape in the context of the human cultural heritage, which today seems largely to have been lost memory.

According to the VASA method (Agnoletti 2010), three are the fundamental principles on which criteria and indicators aimed at the rural landscape management are set up: significance, integrity and vulnerability (Fowler 2003; Romani 1994).

The significance refers to all the values expressed by the landscape; these values change from place to place and are not investigable in a preventive way, rather it needs to search them with specific investigations, neither they have to be confused with the conservation of the ecological aspects.

The integrity is a measure of the completeness and the degree of the maintenance of the landscape structure. A landscape that keeps intact its relations amongst the structure of its components, like in the mosaic of rural landscape, is able to satisfy the integrity relations.

The vulnerability represents the landscape fragility in respect of all the processes that might compromise its significance and integrity. The vulnerability does measure also the resistance to changing of a certain landscape. For example, the agri-forest composite structures are areas at high landscape dynamism, because they can transform themselves rapidly after a cultivation abandonment; instead, in the suburban landscapes it is easy to foresee an expansion of the artificial surfaces.

The Catalog has identified 123 traditional rural landscapes distributed in all the Italian regions, collected in descriptive sheets, which take into account their historical value, typical products and critical issues that threat their integrity, providing also addresses for their valorization¹¹.

An interesting consequential result in terms of regulations that this research project brought is the approval of a decree (n. 17070, 19 November 2012) made by the Ministry of Agricultural, Food and Forest Policies regarding the institution of the “National Observatory of the Rural Landscape, the agricultural practices and the traditional knowledge”. The National Observatory of Rural Landscape has the task to conduct a census of the landscapes, the agricultural practices and the traditional knowledge considered particularly worthy, and to promote research activities to deepen the values connected with the rural landscape, its protection, management and planning, even with the aim of preserving the bio-cultural diversity. Furthermore, the Observatory has to develop the general principles and the guidelines for the conservation and valorization of the rural landscape, with a special reference to the actions planned in the CAP.

1.2.3 Fragilities and potentialities of rural landscape

In the previous paragraphs, the ecological, social and economic features of the rural landscape have been described, even considering the two Italian research projects as important experiences and taking into account the regulation framework of reference.

¹¹ For more information about the Catalog: <http://landscapeunifi.it/it/info?start=5> [Last consultation: 02-28-2015].

The rural landscape is a dynamic system and for this reason, it is always affected by transformations over time. These changes can be seen as fragilities and potentialities regarding the rural landscape, of which main ones are listed here in a synthetic scheme (see below), looking at their driving forces and consequences, which are “readable” on many Italian rural landscapes today.

Furthermore, in this paragraph some fragilities and opportunities aspects are deepened in their interrelations, because they are relevant for other topics dealt with the rest of the thesis.

FRAGILITIES	
Driving forces	Consequences for rural landscape
1. Bad irrigation techniques	1. Abandonment of the land
2. Challenging geomorphological and geographic conditions	2. Biodiversity loss
3. Chemicals in agriculture	3. Climate change
4. Crop intensification	4. Complexity loss of landscape
5. Globalization	5. Connectivity loss of landscape
6. Industrialization	6. Cultural diversity loss
7. Landfills	7. Depletion of water resources
8. Low economic value of rural jobs	8. Desertification
9. Low perception by people of the socio-economic and ecologic roles played by the rural landscape	9. Fire risk
10. Monocultures	10. Habitat loss
11. No crop rotation	11. Homologation and homogeneity of the landscape
12. Regulations not applied	12. Impoverishment and simplification of ecosystems
13. Overuse of natural resources (water consumption, forests cutting, etc.)	13. Integrity loss of the landscape
14. Pollution	14. Marginalization of the land
15. Soil consumption	15. Mixed cultivation loss
16. Uncontrolled urbanization	16. Multifunctionality loss
	17. Place identity loss
	18. Social and economic breaking up
	19. Soil erosion
	20. Soil fertility loss
	21. Soil salinization
	22. Sustainability of energy cycle loss (in ecosystems)
	23. Urban sprawl

Table 1 - Fragilities and Potentialities of rural landscape: a synthetic scheme¹²

POTENTIALITIES	
Driving forces	Consequences for rural landscape
1. Agri-forest-pastoral activities	1. Aesthetic values
2. Biological diversity	2. Conservation of habitat
3. Complexity (in ecosystems and societies)	3. Cultural values
4. Connectivity (in ecosystems and societies)	4. EU grants
5. Cultural diversity	5. Food production
6. Integrity (in ecosystems and societies)	6. Food self-sufficiency
7. Mixed agriculture	7. Maintenance of equilibrium in ecosystems and societies
8. Resilience (in ecosystems and societies)	8. Multifunctionality
9. Short supply chain	9. Quality of human life and wellness
10. Sustainable use of resources	10. Rural tourism (connected with wine and food)
11. Territorial policies (at different scale) for protecting the rural landscape	11. Sense of place and identity felt by local people

¹² The numbered lists in the table are alphabetically ordered. The direct relation amongst the driving forces and the consequences are not shown; this means that there is not any logical correspondence between the same lines of different columns.

Looking at the Table 1, it emerges soon that the scale considered for identifying the “driving forces” and the “consequences” for the rural landscape fragilities and opportunities are different: from a very local scale (almost such a “farm scale”) to a global one. This is done on purpose to underline how a transformation at a local scale can affect a broader scale in terms of consequences: for instance, if the chemicals used only by one farm in the area end up to a channel that flows to a river, the relative impact will be measured at a broader scale (a long stretch of that river) than the original one. Furthermore, it is possible to find one connection at least between a left list item with a right list one (e.g. the monocultures determine homologation and homogeneity of the rural landscape); however, it needs to evidence the circularity character of the phenomena present in the table, so it is allowable to shift a “consequences” list item to the “driving forces” list for triggering a new phenomenon. For instance, the wood cutting at large scale is one of the determiner of the climate change, which is, in turn, a driving force for the desertification (at a small or large scale), which implies, in turn, chemicals use for cultivating and getting profits from land, and the chain can be continued with a circular trend. That is why the items in the table should be considered not in a stand position in each list, rather as an overall view of the main phenomena of cause and effects of transformation of the rural landscape, determined by good or bad management practices.

The most important transformation of the Italian rural landscape in the last century is the agricultural lands loss with a negative and continuous trend (ISTAT 2010) and two are the main reasons: the abandonment of the potentially cultivable lands by the farmers and the urbanization (MIPAAF 2012). The abandonment of agriculture is the first fragility of the Italian rural landscape, because the phenomenon is much extended: from 1920 to 2007, the annual average of abandoned agricultural area was about 110,000 Ha and, from it, 75,000 Ha have become forests, net of fires (Agnoletti 2012). Moreover, from 1950 to 2010 the ratio between UUA (Utilized Agricultural Area) and TAA (Total Agricultural Area) decreased from 79% to 58% due to the abandonment of the agriculture and, in the same time, the growing organizational complexity of farms, which means in terms of

remittances, warehouses, facilities for processing of products, buildings and space aimed at tourism activities, like agriturismo (ISTAT 2010). The level of land abandonment depends on different socio-economic factors, but also the geomorphological and geographical situation contribute to the “farmers’ escape”: the more the land is high in altitude and hard to be worked, the more the farmer will leave it for another possible occupation somewhere else. This determines the depopulation of the marginalized lands and, consequently, the woods advancement. In qualitative terms, this process can vary according to the difference of elevation. For instance, if in mountain areas and high hills the abandonment of agricultural lands - deriving precisely from the process of depopulation - seems to favor the advance of the forest and pasture, in the hilly area of the little hick (especially in the Central-North sharecropping of Italy), the wide variety of farm typologies seems to underlie the deconstruction of the many and various historical agricultural landscapes. Moreover, it notices a recomposition in a discontinuous patchwork landscape and rich of internal fractures and detachments, where semi-abandoned areas approach to intensively cultivated areas with crops specialized and territorially rooted, which are areas subjected to extensive use that varies in face of changes in Community subsidies (Lanzani A., 2003). Furthermore, the abandonment of agricultural lands and the wood advancement determine relevant environmental and socio-economic impacts, like the biodiversity decreasing, the hydrogeological risk increasing and the landscape decay: it is well known that the agri-forest-pastoral activities play a fundamental role as an indispensable defense for the maintenance of the territory, the risk prevention and the landscape protection (Agnoletti 2012).

Another important aspect of fragility regarding the rural landscape is the fragmentation; in landscape ecology it is defined as a break of a habitat or ecosystem, resulting from the interaction of the overall structure with the change of a function (Forman 1995), which can be, in the case of rural landscape, new infrastructures and buildings (barriers which increase spatial discontinuity) that break the naturalness and the fauna passing. A consequence can be that the effect of external negative impacts on habitats increases and the number of suitable and reachable habitat sites decreases (Jongman 2002). While in the landscape ecology the fragmentation is measured by the calculation of the ecological energy and the connectivity of important nucleus of species

from different habitats, in the rural landscape it is measured by the integrity of its functional structures, such as the hedgerows nets. In both cases, the decreasing of the integrity degree will determine an impoverishment of biodiversity and habitats, because the connectivity amongst the different ecological levels will miss. Furthermore, in the analysis of landscape the fragmentation is measured and monitored by different parameters of the patches, which are the extension and the isolation, but a third element is important to consider that is the edge effect (as underlined for example by Frate et al. 2011). This is particularly relevant when the transformation affects the rural landscape that is turning rapidly into a forestry one.

The fragmentation of the rural landscape is caused mainly by the urban sprawl. The urbanization, indeed, influences the rural areas, letting become them a multifunctional complex in an ever bigger urban network, constantly without a real definition. Moreover, the agriculture abandonment is connected with the urbanization process, which determines not only the construction of new buildings and infrastructures, but it also affects on the better lands in terms of productivity and localization: flat, fertile, easily reachable and workable lands, such as the urban fringes and coastal areas (MIPAAF 2012). Therefore, these spaces are often the most precious in terms of economy and agricultural production, as well as the food security. In addition, the urbanization provokes the soil sealing process, which causes the biodiversity loss, the water resources scarcity, the increasing risk of floods and global climate warming. From this perspective, the urbanization affects very much the landscape management in such negative way, as well as the woods advancement connected to the agricultural abandonment, but the former phenomenon is irreversible in terms of strong environmental impact. According to ISTAT (2014), the urbanization rate, that was very high in 2012 (8.77%), fortunately seems it is slowly decreasing in the last couple of years.

Strongly connected to the soil sealing, the desertification is another consequence of fragility affecting the rural landscape, because it is the process of irreversible reduction of the soil capacity to produce resources and services (FAO-UNEP-UNESCO 1979; FAO-UNEP 1984). At national scale, 1/5 of the Italian landscape is at desertification risk (ENEA 2005). The causes of this phenomenon are many: uncontrolled urbanization, landfills, pollution,

fires, climate change, prolonged drought, soil erosion linked to violent weather events, unsustainable exploitation of resources, for example due to poor use of crop rotation, the excessive use of chemicals that pollute the ground water, poor irrigation practices and soil salinization. In this framework, the gibe for the rural landscape lies in one of the causes for the soil consumption that is the spreading of agri-ecosystems economically efficient, but ecologically fragile. The rural ecosystems of the agricultural landscapes are severely undermined by globalization, industrialization and maximized productivity. The intensification of crops and the monoculture produce the simplification and impoverishment of the ecosystem through the rupture of ecological interrelationships and a high consumption of environmental resources (Ruiz and Domon 2009). This environmental degradation made by the technical and economic evolution rooted in the logic of maximum profit, is significantly reflected in the landscape heritage. In this case, the consequence at sight is a homogenous landscape, far from the original shape, where the globalization has provoked gradually the loss of the identity value featuring that place.

In front of all these fragilities of the rural landscape, the main role is committed to the populations that live and build up the rural landscape; indeed, they do not suffer only its transformations. It seems that today there is more consciousness regarding the necessity to “make actively the landscape” by local communities in terms of projects and actions aimed at the protection and valorization of their territory; it is the same awareness grew along the last decades for the environmental issues. In this term, an important help might come from the promotion of perception. In Italy, there are many rural landscapes not well identified (mostly the traditional ones: thinking at the drove roads, today hardly visible) from people and because of this, they are not considered important or worthy of conservative actions. Therefore, a sustainable management of rural landscape for the future must consider all its diversity in shapes and functions, where people are the central messengers of the promotion of its peculiarities, for example through the rural tourism. One of the most interesting benefit, in fact, regarding the rural landscape is the capacity to create a favorable background for let people relaxing themselves and staying peaceful. Indeed, some landscape characteristics like the rivers, the countryside plenty of meadows, the hedgerows and the woods influence

positively people to enjoy these places for hiking or exploring in free time. This depends on the restorative capacity of some landscapes with poor anthropic elements and rich of naturalness (Kaplan S. 1995; Kaplan S. 2001; Kaplan R. 2001), the same perceptive features that recall the Savanna-like landscape, so instinctively familiar to humans, as it is seen above. Moreover, the quality of a landscape can interact positively with several physiological parameters of the individual and, the more is pleasant the landscape, the more is the overall wellness of the individual (Berto 2005; Harting et al. 2003).

The conversion of the rural areas towards the multifunctionality allowed to conceive the agriculture in a sustainable way and to distinguish clearly the productive phase from the goods and services provision. The multifunctionality is a new scenario where the countryside can contribute not only to the food supply, but also to residential and touristic-recreational functions, advantages for the settlement of the small and medium factories (especially for the tertiary sector), environmental services, conservation of biodiversity, water supply and renewable energy (from sun, wind, biomass and hydroelectric power) (Sotte 2003). In this framework, in the last decades especially the segmentation of food commodities emerged in relation with the quality and typical products of the rural landscape. This phenomenon has been accompanied by a gradual reconciliation of rural people to searching a landscape and a life of quality; it has been a rediscovery of countryside that has allowed creating a real “landscape request” (Esposito and Sotte 2001), which also oriented the society towards virtuous dynamics of sustainable development. In this sense, the big opportunity is to develop a “food and wine” tourism, putting in touch the consumer directly with the place where he/she can get the products, so the quality of the landscape (mostly the traditional one) can become a strategic factor through which promoting the food products. This must not imply to renounce at the modern productive techniques, rather to work the land in a sustainable way whereby it can preserve also all that peculiar elements that make the landscape the emblem of its products (Tempesta 2011). The landscape asset is a crucial element for encouraging the rural tourism, but it is not enough by itself, as Mastronardi et al. (2012) demonstrated: the aesthetic values are not always conceived as an economic resource, mostly if the touristic entrepreneurs are located in marginal areas. This demonstrates that further efforts have to be conducted for educate people to look at the rural landscape in

its complexity as an opportunity for their economic and social development. Despite this consideration, it is remarkable to make notice that in Italy the most visible expression of the rural tourism, which is the agriturismo (officially, the N.L. 96/2006 defines agriturismo activities those of receipt and hospitality practiced by farmers through the use of their farms and connected with the activities of land cultivating, forestry and animal husbandry), is increased considerably: from 1998 to 2011 the number of agriturismo rose by 110% (ISTAT, 2012).

This opportunity starts, again, from the people who live these landscapes and an important requirement is the resilience, meant not only in the ecological way, but also in the social one: the capacity of a community to restore an equilibrium condition after an external change (thinking at economic crisis, or natural disasters provoked in consequence of the climate change). This capacity is directly connected with the landscape, so the higher the skill of a landscape to self-organize and regenerate itself towards a new equilibrium, the lower its intrinsic fragility compared to the many stresses of multiple nature to which it is undergone by. If a rural landscape is characterized by a strong ecological and social resilience, its capacity to restore itself in case of transformation will be more efficient rather than a landscape that has not this feature.

What it is clear is that the rural landscape is not only a matter of farmers, but of all the local community, which should recover and keep its own landscape identity as a strength element for the future development. Nevertheless, this is not enough, because the will of people should encounter the tools through which realize the actions aimed at the management and conservation of the rural landscape, which are the territorial and landscape plannings at different scales. Moreover, the latter have to be consistent with the agrarian policies for the rural development. In this framework, while the landscape planning should provide the opportunity to local communities to define priorities and goals regarding the landscape, the agrarian policies should give the tools for realizing those goals.

1.3 Finding a balance: the key steps to improve the management of rural landscape

Contents:

- Taking into account the fragilities and potentialities of the rural landscape, how much the regulations can help to improve its management: the role of protected areas
- Expert knowledge (based on research projects) needs to match local knowledge (expressed through people's needs, perceptions and education and resulting from the collective experience of generations of observation and practice) in a bidirectional process of social learning
- Building up new social and economic models to fit the rural landscape prerogatives for managing it in a participative way

Considering all the features regarding the rural landscape, its fragilities and opportunities factors seen in the previous paragraphs, here a synthesis of which are the key-stones for finding a balance between the positive and negative aspects are illustrated, trying to trace a possible and realistic direction for implementing good practices of the rural landscape management.

One of the most widespread model to preserve the landscape in Italy is the institution of protected areas, because it implies restricting tools consistent with the mission of conservation. However, the presence of a protected area generates sometimes conflicts between the preservation requirements and the expectations of socio-economic development coming from the local communities. Indeed, while from one side maintaining the elements of a landscape (especially a traditional or historical one) requires the perpetuation of techniques, rules and modalities of land use not anymore compatible with the current economic profile, from the other side the local communities stress the necessity of reaching a quality of life correspondent to those models widespread in the contemporary society (Balletti and Soppa 2005). The local development theory, or better, the self-sustainable local development, that let emerge the peculiarities of places and roots the possible transformations on the valorization of these

characteristics through recovering the role of the “richness producers”, can give a chance to overcome the conflictual visions. In this sense, the population engagement along all the phases of the self-sustainable local development model (educative and training phases to deepen the knowledge regarding the landscape, designing and managing phases) should help the effectiveness of the real shared choices. Ideally, all the territory should be managed as a protected area applying this model, but this is not possible, so the protected areas have to be considered model places for the rest of the territory for experimenting policies, methods, techniques, planning and managing practices regarding the landscape transformations, also able to propose new sustainable relations amongst man, nature and society.

According to the Italian regulatory system, there are two management models of the rural landscape: the agricultural park and the rural district, the former comes from the territorial planning, the latter from the economic programming. The agricultural park has not an official jurisdictional definition and it is instituted by region authorities with the aim of facilitating and guaranteeing the agricultural use of lands, increasing the rural lands value to sustain them economically and also in the process towards the sustainability (Fanfani 2009). The agricultural park represents a territorial structure aimed mainly at primary production, its protection and enhancement and together with the use of cultural and recreational environment for citizens, in compatible terms with the main destination (Ferraresi and Rossi 1993). The agricultural park vision finalizes to overcome the general restrictive dimension of the protected areas for proposing a valid tool for planning and managing the rural territory, especially where there is a high request of rurality from its community and the rural landscape needs to be converted towards the multifunctionality.

The rural district is regulated by the L. D. 228/2001 and is defined as a local productive system with a homogeneous historical and territorial identity, derived from the integration amongst the agricultural activities with other local ones, and the production of peculiar goods and services, which are consistent with the natural vocations of the landscape. The rural district is a real model of local development because it is provided by a financial autonomy, independent from the national or community

plans, and this guarantee a long-term action. It operates as a programming agency in advantage of the territory valorization, and it aims to enhance the growing and stabilization of preexistent local economies.

Both the models constitute two subjects of territorial governance, and while the agricultural park is oriented to strengthening the agriculture, the rural district involves all the stakeholders in a strategy of territorial diversification aimed at economic and social growth, in a view of cohesion, sustainability and conservation of natural balance for guaranteeing a quality life to the communities. Thus, the agricultural park and the rural district are configured as territorial structures finalized mainly at the primary production and the landscape conservation and valorization, so they are able to combine both the objectives of sustainable development and landscape protection in an integrated way, even facing the management of transformations.

It is evident that the protected area as institution for managing the rural landscape is not enough if there is not a deep understanding of the social, economic and cultural peculiarities of the territory. Useful tools are the methodologies implemented through issues-oriented research projects, like the one regarding the Traditional Agrarian Landscapes and the other one about the Historical Rural Landscapes described before, because they allow to have a knowledge base for analyzing, categorizing and letting emerge the strength and weakness elements of these rural landscapes, so to recommend the right actions in terms of policies for the best management. For reaching this aim, a further effort is requested in the direction of understanding and including the needs of rural communities in the management tools. Indeed, the process of knowledge and policies construction regarding the rural landscape has always to foresee that the expert knowledge needs to join and include the local knowledge (that is primarily tacit, implicit, informal, context dependent, resulting from the collective experience of generations of observation and practice; Ingram 2008) expressed by the stakeholders of the territory. As it will discuss in the next chapter, all along the process of landscape planning, people's engagement needs to start from their perceptions and preferences through which analyzing the landscape features, during, for example, meetings and interactive activities. These inclusive processes will represent fundamental steps, in which the exchange

between the experts and the stakeholders regarding the environmental, ecological, cultural and economic issues will constitute a real social learning process. In any case, all this path should be follow always a win-win logic (Gissi 2011).

The need of considering the communities' perception in the rural landscape planning and management is consistent with the ELC, which stresses explicitly its principles on the subjective component of the landscape in terms of engaging the populations in the projects of territorial transformation. Indeed, the subjects called to express a judgment evaluation are not only the decision makers, who have the task to elaborate territorial policies, nor only the experts, who have an external and technical knowledge about the landscape, rather the local communities, who are the first landscape-builders. This means that their perceptions cannot be neglected and their judgments have to be included in the landscape planning. On this purpose, Fjellstad et al. (2009) point out that the functions attributed to a landscape do not depend exclusively on its physical-morphological composition, but also on the values system attributed by the communities (Haines-Young e Potschin 2005; Haines-Young et al. 2006). Consequently, in the resources management issues regarding the landscape, it is fundamental that the judgment of value results from the composition of all the points of view expressed by the stakeholders (Gómez-Sal et al. 2003).

A very informal but steady method for approaching the rural landscape management taking into account the community's perceptions and evaluations is the community map (or Parish Map). Its origin is from the 80's of the last century in Great Britain as a consequence of the homologation process of places and local cultures, and a social disruption, that involved mostly the English rural landscape after the crisis of the Second World War (Clifford et al. 2006). The community map is a tool with which the inhabitants of a place can represent (mostly graphically, but not exclusively) their heritage, landscape, knowledge that they recognize as their own and want to transmit to the future generations. It is a simple tool able to express the linkages between the community and their material and immaterial heritage (Becucci 2013). An interesting aspect is the meaning behind the final product that is a map: a participative path is indispensable to the community for designing in a shared and aware way the map, with a

responsible attitude regarding its own territory; this process is important to recognize the value and the awareness of the places, to increase self-esteem of the community and to mature its own growth. Since the 90's, when the Parish Map approach was used in Great Britain by the Countryside Agency for implementing an active protection of the rural landscape (see Swanwick et al. 2002, which will be deepened later), the potentiality of the community map as a useful tool for enhancing people's participation in the landscape planning process was worthy. This is because the map should express, in a logic of sustainable transformation of the landscape, a set of assessments given by the community about the current state of the natural and cultural heritage, underlining, for example, urgent and priority actions for conserving or recovering certain places or goods, or possible measures for actions of transformation of the landscape. In this sense, the community map can be helpful not only for recovering the collective memory of a certain territory, but also for making more effective projects aimed at the landscape management by complementing the official territorial planning that already acts at regional level.

Another important key-stone regarding the management of the rural landscape is what Musacchio (2013) calls "cultivating deep care" attitude. It is the adaptive process for deepening people's affinity of places where they live around, enhancing their appreciation, awareness and actions for biodiversity, landscape and their own well-being. This concept is strongly connected with the necessity of calling people in participating the planning processes of their own landscape and cultivating deep care in this dimension means educate community to understand, valorize and taking care of their resources. This is also the sense of the Place-Based Education, because if the education of citizen is related to their own place, this can influence the well-being of the social and ecological places people actually inhabit (Gruenewald 2003). Therefore, education programs based on the landscape understanding, valorizing and protecting have the potential to influence the direction of public acceptance of landscape values, and, consequently, the course of territorial planning.

Of course, only the education is not enough to revitalize the rural landscape life to go towards its own aware management. Indeed, it would be necessary to encourage

networks of small cooperative family enterprises, which are able to renew of sense the rural landscapes with innovative approaches to work the land (Marsden et al. 2002). The territorial planning can enhance this process, by contributing to support especially the weak local stakeholders in the valorization (both in economic and cultural terms) of their potential heritage of their lands. The right direction of this process might be the multifunctional agriculture, the conversion of the farms towards enhancing the ecological functions, the rise of a new generation of farmers. These people should be characterized by a strong ethical set of values, should increase the short food chain implementation and spread out the benefits of this production approach both to other farmers and to consumers, should reduce the use of external input in their productive processes, such as seeds, cultivars, machines, chemicals and technical-financial flows (Magnaghi 2011).

It appears evident that only combining all the different operational tools available is possible to start an improving process in favor of the rural landscape. The regulation system is not enough without the involvement of all the diverse actors called in its application; the rural community participation is not possible if people are not aware of the potentiality of their resources; the increase of the agricultural sector is not realizable if the national and international policies do not “prepare the ground” in the way that the farmers can face their job without losing the gain.

The management of the rural landscape starts from people. Involving stakeholders in the decision-making processes may increase the likelihood that the discussions made during participatory events are perceived to be holistic and fair, accounting for a diversity of values and needs, and recognizing the complexity of human-environmental interactions (Richards et al. 2004). In this way, stakeholder participation can enhance the quality of decisions regarding the rural landscape by considering more comprehensive information inputs, and it emphasizes empowerment, equity, trust and learning (Reed 2008). For these reasons, the rural landscape management, implemented from wide to small scales, should not ever prescind from the communities’ engagement.

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CHAPTER TWO

People and (in) landscape



Giancola C. – “Walking immersed in the landscape” (2013).

2. PEOPLE AND (IN) LANDSCAPE

The landscape would never exist without humans, because of its essence is made by the combination of human action and (in) nature, therefore its management starts from people. However, which people? Primarily, people who live and enjoy a certain landscape, as they are the first agents of transformation and shaping of the surrounding territory. Thus, they have to care, or better, they should care about it. There is a word that can summarize the behavior that people should have regarding their own landscape of belonging: “engagement”. Its meaning is connected with an action to take, or an obligation, a condition that binds to something, so it requires a strong link between people and place. If this link is weak, it means that people are not very engaged and they do not really care about the landscape where they live. Therefore, the engagement implies a certain degree of awareness about what are the resources concerning the landscape, what are its weakness and strengths.

This is a basic assumption included in the main European address system of reference for the landscape, the ELC, that exalts the central role of people’s perception of the landscape (firstly, in its definition) and requires their participation for its care and management, through developing landscape policies (art. 5, Council of Europe 2000).

To be engaged, people need to participate, that means to take part in something they can contribute to develop. In terms of landscape management, they contribute to bring their opinions, perceptions, needs, expectations, fears, ideas and projects, hopes and values. The landscape management is made by all of these things, so there are many reasons why including people’s participation, or to say it more technically, stakeholders’ participation in the decision-making processes aimed at the landscape management.

2.1 Community engagement: the primary tool for the landscape management

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decision-making processes aimed at the landscape management

- Why the participation is so important: evidences from literature about features of stakeholders and process
- Some case studies recommend to map the community values and integrate the participation with the quantitative analysis
- Who is the stakeholder and what kind of participation is needed must not be underestimated elements

2.1.1 Participation: features of stakeholders

People shape the patterns and the expressions of the landscape, but in the same time the landscape influences people by arousing emotions and feelings, by stimulating the definition of meanings and values, by contributing, thus, to represent an important element of quality life of people themselves. This is the circular relationship between people and the landscape (Castiglioni 2005).

When people are invited to attend an event where they can express opinions and thoughts regarding a certain issue they really care about (and this is a necessary condition), such as their own landscape future, a probable first reaction is supposed to be positive, because the participatory event is perceived worthy to be attended. Other feelings might come after, such as a sense of trust in organizing entity (because it demonstrates to be open to people's opinions) and a perception of transparency can characterize the process. Moreover, Richards et al. (2004) assert that stakeholder participation may increase the likelihood that decisions regarding the landscape are perceived to be holistic and fair, accounting for a diversity of values and needs and recognizing the complexity of human-environmental interactions. Stakeholder participation can enhance the quality and durability of decision regarding the landscape resources by considering more comprehending information inputs (Fischer 2000; Beierle 2002; Reed et al. 2008); however, the quality of decisions made through stakeholder participation is strongly dependent on the nature of the process leading to them (Reed 2008). What people perceive as relevant drivers of change in the landscape during a participative process might not coincide with other indirect drivers of change that people are not able to indicate, just because they do not deal with them (Iniesta-Arandia et al.

2014). This means that the “decisional power” of certain stakeholders to pursue goals strongly depends on their own beliefs and preferences (McShane et al. 2011) and it has to be taken into account. In this perspective, it is important to remember that stakeholder participation in environmental decision making (so, consequently, in landscape issues) is a democratic right, as it is enshrined in the Aarhus Convention (UNECE 1998), so it has to be facilitated by Governments (Art. 3) and made in practice with plans and programs by ensuring a transparent and fair framework (Art. 7). Accordingly, if participation is a democratic right, not just a normative goal, then participation has to be institutionalized (Richards et al. 2004), going beyond the increasing incentives for it, to enable stakeholders to influence or alter the questions that are asked and the outputs that are produced (Reed 2008).

Participation amongst stakeholders can empower them through the co-generation of knowledge with researchers and increasing participants’ capacity to use this knowledge (Greenwood et al., 1993; Okali et al., 1994; MacNaughten and Jacobs, 1997). In this way, a social learning is promoted (Blackstock et al., 2007), because stakeholders and the wider society in which they live learn from each other through the development of new relations. This process allow to be built on existing relationships and to transform adversarial ones as individuals learn about each other’s trustworthiness, also they learn to appreciate the legitimacy of each other’s views (Pahl-Wostl and Hare, 2004; Stringer et al., 2006). In this way, by establishing common ground and trust between stakeholders, participatory processes have the capacity to transform adversarial relationships and find new ways for participants to work together (Stringer et al., 2006). This may lead to a sense of ownership over the process and outcomes. If this is shared by a broad coalition of stakeholders, long-term support and active implementation of decisions may be enhanced (Richards et al., 2004). Furthermore, social learning may be one of a number of mechanisms that can deliver more pragmatic benefits from participation, with groups of people who develop more creative solutions through reflective deliberation (Fritsch and Newig, 2012). In assessing the participation, it cannot be ignored the fact that it is both a method and a goal. As a method, participation is the process by which social actors and communities cooperate and collaborate in the implementation of projects, programs and plans. As objective, participation is a process that strengthens local actors and local

communities through the achievement of skills, knowledge and experience, to increase research, self-development and sustainability (De Marchi 2005).

Amongst the stakeholders involved in the participatory processes aimed at the landscape management there are, of course, the local governments. Sometimes, their position is not easy, because they need to face challenges related to long-term environmental sustainability, economic development and other priorities coming from the civil society. Therefore, regarding the landscape management they are often constrained from addressing problems coming from the territory and growing public demands given institutional, jurisdictional and economic constraints. One promising concept that might help to overcome these barriers is that of “place-based governance” (Edge and McAllister 2009). This approach seeks to utilize local or regional place-based identities to motivate and engage civil society, government and other organizations in decision-making processes that foster social capital and institutional learning, and as one that promotes a local sense of place and community development, without being constrained by politically delineated boundaries (Kruger and Shannon 2000; Raco and Flint 2001; Pollock 2004).

2.1.2 Participation: features of the process

Along this overview regarding the features of the stakeholder participation in the landscape management process, it is important to remark that when implementing a participatory process, stakeholder participation should be considered right from the outset, from concept development and planning, through implementation, to monitoring and evaluation of outcomes. Indeed, since the first stages, local interests and concerns can be taken into account easier than in a second moment, and a variety of ideas and perspectives can be included soon in the project design. In this way, the likelihood that local needs and priorities are more successfully met (Dougill et al. 2006). Engagement with stakeholders as early as possible in decision making has been frequently cited as essential if participatory processes are to lead to high quality and durable decisions (e.g.

Gariépy 1991; Chess and Purcell 1999; Reed et al. 2006). Typically, stakeholders only get involved in decision-making at the implementation phase of the project cycle, and not in earlier project identification and preparation phases. Increasingly they may also be involved in monitoring and evaluating the outcomes of the decision-making process (Estrella and Gaventa 2000).

Furthermore, it has been demonstrated that the stakeholder participation improves the quality of local plans for the long-term management on the basis of theoretically-derived criteria, and found that the presence of specific stakeholders significantly increased their quality (Brody 2003). This means that the engagement of the stakeholder can drive the landscape management process towards a high effectiveness of goals. It is also true that reaching the final aim depends on many variables, but the interests and the aims of the participants and how strongly they favour the outcomes are one of the most important determinants of the process, as some authors stood out (Fritsch and Newig, 2012). Although these researchers' experiences suggest that stakeholder participation may improve the quality of the decision-making process aimed at the landscape management, it is important to remember that the quality of a decision is strongly dependent on the quality of the process that leads to it (Reed 2008).

It is not enough simply to provide stakeholders with the opportunity to participate in decision-making though; they must actually be able to participate (Weber and Christopherson 2002). When decisions are highly technical, this may imply educating participants, developing the knowledge and confidence that is necessary for them to meaningfully engage in the process. As it is already mentioned, to reach this aim local and scientific knowledge need to be integrated to provide a more comprehensive understanding of complex and dynamic socio-ecological systems and process. Such knowledge can also be used to evaluate the appropriateness of potential technical and local solutions to conflicting situations. Many authors found that a combination of local and scientific knowledge might empower local communities to monitor and manage landscape change easily and accurately (e.g. Reed 2007; Ingram 2008). It means joining the "know why" (Lundvall and Johnson 1994), which is the scientific knowledge partly attempts to understand the underlying principles and theory behind observable

phenomena, with the “knowhow” of local knowledge, that is primarily tacit, implicit, informal, context dependent, resulting from the collective experience of generations of observation and practice (Ingram, 2008). By hybridizing these knowledges, as Stringer and Reed (2007) assert, it may be possible for researchers and local communities, with their different understandings, to interact in order to produce more relevant and effective environmental policy and practice. Moreover, participation enables interventions and technologies to be better adapted to local socio-cultural and environmental conditions, and it may make research more robust by providing higher quality information inputs (Reed et al. 2006, 2008).

In this perspective, a debate that is growing interest is the “knowledge transfer/exchange” between knowledge producers (typically researchers) and user (typically stakeholders). Although this has traditionally focused on one-way transfer of knowledge (e.g. the commercialization of research outputs), interest is shifting towards more collaborative approaches (where knowledge producers and users communicate and influence each other throughout the research process) and the joint production of knowledge (where multiple forms of expertise, for example from researchers, practitioners and the public, are valued equally in the production of knowledge) (Phillipson and Liddon, 2007). With the same base philosophy, the PAR (Participatory Action Research) approach involves a diversity of stakeholders as active participants in an integrated process of research and action (action can represent a social change process, community development, conservation projects, etc.) (Bacon et al. 2005); it is designed so that both the process and results of research have direct impact on social and ecological issues regarding the landscape. It seeks the fair and equitable participation of all relevant stakeholders throughout the process and has the potential to increase the depth and relevance of the research process.

2.1.3 Recommendations from some researches: mapping the community values and integrating participation with quantitative analysis

A number of participatory tools have been developed to show how and where local knowledge should be incorporated into decision making aimed at the landscape

management (e.g. Lynam et al. 2007; Reed 2008; Stenseke 2009). What emerges from these studies is the need for a science that uses active research to identify local priorities for management, considers values at multiple scales, emphasizes empowerment, equity, trust and learning, and systematically integrates multiple knowledge systems into environmental decision making. However, it needs another “ingredient” to take into account when planning the landscape management in a participative way that is the resources evaluation at place-specific scale, and the local communities are the best actors able to do that. Recognizing these needs, many researchers (Brown and Reed, 2000; Tyrväinnen et al., 2007; McIntyre et al., 2008) adopted the method of mapping the community values in order to inform the landscape management. The premise to describe the rationale underpinning of community values mapping comes from Zube's (1987) concept of human–landscape relationships, which are described through three concepts: “the human as an agent of biological and physical impacts on the landscape; the human as a static receiver and processor of information from the landscape; and the human as an active participant in the landscape — thinking, feeling and acting” (p. 38). Raymond et al. (2009) applied the mapping of community values at the natural capital and ecosystem services of a geographic area (in Southern of Australia) because these elements need to be uncovered for reaching and understanding the sense of place of the communities. They also based the method on the concept of “coupled social– ecological systems” theory, which posit that human beings are agents in the landscape and attribute meaning and value to biophysical features, which are not solely instrumental and monetary in nature.

Another interesting application comes from Onaindia et al. (2013), who develop a participatory process for integrating the knowledge and cooperation of stakeholders from different disciplines, sectors and levels of hierarchy in a decision-making process aimed at drawing up a new management plan of a Biosphere Reserve in Spain. The innovative methodology used for the purpose is based on the integration of participation methods with quantitative analysis. The final objective is to predict changes that might result from the implementation of the proposals arising from the participatory process, including an evaluation to prioritize actions needed to achieve the desirable results. A protocol for participation was drawn up with subsequent phases (from presentation and discussion of

the objectives with stakeholders to the development of workshops and proposals for action for the new management plan, from the presentation of the results to their evaluation and finally the application of actions). The transdisciplinarity was broadly respected (public-administration technicians, policymakers, researchers and experts in different disciplines, personnel from various environmental associations and NGOs, environmental education professionals, and representatives from agriculture and forestry). This was very important, because removing the walls between disciplines and civil society enable new knowledge and understanding, to emerge through integrated, mutually learned insights (Torkar and McGregor, 2012). Onaindia et al. underline that the integration of quantitative analysis with participatory valuation is a valid method, which is possible to be applied in other reserves for planning their landscape management; furthermore, the public participation is the strongest element of the entire process, because it allows initiating social learning among stakeholders, resource managers, and policy makers. In the end, they can recommend five major points for making successful the methodology: 1) the institution and persons responsible for facilitating and moderating the participatory process, (2) transparency in the design of the protocol, (3) the involvement of decision makers in the design of the process, (4) analysis of expert's opinions to create workshops, and (5) the creation and evaluation of quantitative scenarios for the applied proposals (Onaindia et al. 2013).

2.1.4 Who is the stakeholder and what participation does it need?

Beyond the discourse about the strength and weakness points of the participatory process aimed at the landscape management, a simple but relevant question raise: who is a stakeholder? The answer is not easy and, mostly, there is more than one answer to that question, related to the character of the participants, the interest they have and the number of locals involved (Billgren and Holmén 2008; Stenseke 2009). Therefore, who should be involved as a stakeholder? Theoretically, everyone is a stakeholder and not only people who obviously “have a stake” should be called to attend the participatory process, but the public represents all stakeholders (Billgren and Holmén 2008). Guidelines for the implementation of the ELC mention “the public and other relevant stakeholders”

(Council of Europe 2009, pp. 6, 14, 22) or “local people and stakeholders” (Council of Europe 2009, p. 21). It defines “all the relevant stakeholders” as following: “national, regional and local authorities, the population directly affected, the general public, non-governmental organizations, economic operators and landscape professionals and scientists” (Council of Europe 2009, p. 15). This is a very broad and inclusive description and according to this definition, local people and the public can but do not necessarily signify the same group of people (Sevenant and Antrop 2010). Therefore, finding the right stakeholders to involve in the participatory process aimed at the landscape management is not easy and the organizers should always consider the objectives of the process and, as consequence, all the possible users who depend on the decisions derived from those objectives. Moreover, it cannot lack an effort to take people focused together on their own sense of community and place.

Another important factor to bring in the discussion is what “participation” really means for the organizers and the participants: it can be an end in itself, an expression of democratic principles (according to a “normative” perspective), it can aim to increase information (“substantive” perspective), or it can justify a policy decision to be made (“instrumental perspective”) (Bickerstaff and Walker 2001). These facets are related to the distinction between informative or consultative and participative processes (Soneryd, 2004).

About this issue, Pretty (1995) examined the multiple ways that development organizations interpret and use the term participation and he found it can be resolved into seven clear types. These typologies range from manipulative and passive participation, where people are told what is to happen and act out predetermined roles, to self-mobilization, where people take initiatives largely independent of external institutions (Table 2). These typologies suggest that the term "participation" should not be accepted without appropriate clarification.

Table 2. Typologies of participation: how people participate in development programs and projects (Pretty 1995).

Typology	Characteristics
1. Manipulative participation	Participation is simply a pretense, with "people's" representatives on official boards but who are unelected and have no power.
2. Passive participation	People participate by being told what has been decided or has already happened. This process involves unilateral announcements by an administration or project management without any listening to people's responses. The information being shared belongs only to external professionals.
3. Participation by consultation	People participate by being consulted or by answering questions. External agents define problems and information gathering processes, and so control analysis. Such a consultative process does not concede any share in decision making, and professionals are under no obligation to take on board people's views.
4. Participation for material incentives	People participate by contributing resources, such as, labor, in return for food, cash or other material incentives. For example, farmers may provide the fields and labor, but are involved in neither experimentation nor the process of learning. It is very common to see this process called participation. Yet people have no stake in prolonging technologies or practices when the incentives end.
5. Functional participation	Participation seen by external agencies as a mean to achieve project goals, especially reduced costs. People may participate by forming groups to meet predetermined objectives related to the project. Such involvement may be interactive and involve shared decision-making, but tends to arise only after major decisions have already been made by external agents. At worst, local people may still only be coopted to serve external goals.
6. Interactive participation	People participate in joint analysis. Development of action plans and formation or strengthening of local institutions. Participation is seen as a right, not just the means to achieve project goals. The process involves interdisciplinary methodologies that seek multiple perspectives and make use of systemic and structured learning processes. As groups take control over local decisions and determine how available resources are used, so they have a stake in maintaining structures or practices.

7. Self-mobilization	People participate by taking initiatives independently of external institutions to change systems. They develop contacts with external institutions for resources and technical advice they need, but retain control over how resources are used. Self-mobilization can spread if governments and NGOs provide an enabling framework of support. Such self-initiated mobilization may or may not challenge existing distributions of wealth and power.
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Looking better at this table, the first five typologies cannot be defined properly “participation”, because people are not completely autonomous and self-motivated to attend the events. As the author states, great care must, therefore, be taken over both using and interpreting the term participation. It should always be qualified by reference to the type of participation. What will be important is for institutions and individuals to define better ways of shifting from the more common passive, consultative and incentive-driven participation toward the interactive end of the spectrum.

By the lessons learned here, it follows that it is impossible to implement a fixed blueprint that will be successful for all participatory processes that aim to develop policy, but Rogge (2012) gives a sort of toolbox of success factors that can be used flexibly in the process for planning and managing the landscape. This toolbox gathers a set of five components or building bricks and a combination of them needs to be adapted according to the specific context of the process.

The first component is the definition of common goals that have to clearly reflect the choice of different groups of participants and the succession amongst these groups. The objectives can strongly influence the structure of the process; that is why the goals are called structured. Moreover, common desired outcomes actively engage the participants, so a participatory process will have better chance at success if people are gathered around a common objective. Defining common goals is helpful also to provide a common language, or a way to relate to a common language, which is fundamental when people have diverse background and expertise for finding an effective way of

communication. The landscape issues, despite include diversity in terms of multidisciplinary implied, can be good subjects to reach this aim.

Identifying the actors is the second component of the participation toolkit. It is extremely important to have a clear view on who the significant actors are, trying to know what are their aspirations, hopes and desires. In other words, it is useful to trace an actors' map - or a participants' map, as Sevenant and Antrop (2010) referred to. Furthermore, if possible, getting close to the stakeholders by interviewing or discussing face to face before the event (for knowing their position, interests, needs) can help to build and implement a successful participative process.

The third component refers to finding a balance between democratic decision-making and technical expertise. Indeed, in the policy-related processes, there is often a subtle interplay between technical work and policy work: the first one is done in order to guarantee qualitative results and to develop confidence in the results, the second one is focused on the development of public support and engagement for the process. Therefore, it is important the creation of a continuous and fluent interaction between both "streams".

A participatory process needs to be designed in terms of resources, time and contents. This is the fourth component of the toolkit and it is a crucial task, because having a team for managing all different aspects of the process, keeping a general overview, greatly contribute to the success of the process. Each step of the way needs to be carefully discussed and deliberated. Moreover, groups of actors cannot be gathered ad hoc and without a clear rationale of why and how they are brought together at a specific moment in time, providing them transparency about the course of the process, so the succession of the different steps needs to be logical.

Guarantee transparency, fairness and procedural justice of the process constitutes the fifth and last component. For participants it is essential that there is a complete transparency about the course of the process, as underlined since the beginning of this paragraph. It is crucial that the actors know in which steps of the process they will be involved (and in which ones not), what will happen with the data they provide, who will be able to make decisions, which preparations are expected, etc. In order to guarantee

transparency, it is important to elucidate the degree of participation to the participants, because the actors need to be fully aware of the status of their participation and are informed on the way the final decision will be taken thanks to them.

The combination of the toolkit components is very flexible and allow to be adjusted for each process individually. This variety of combinations should be considered to be an asset as it offers different stakeholder groups the possibility to tailor the process according to their own specific circumstances, allowing them to come up with original methods, creativity and imagination; elements that are crucial in participatory processes aimed at the landscape management.

2.2 Experiences from Europe

Contents:

- Some case studies are analyzed from Europe as good practice in implementing the community engagement in the decision-making process aimed at the landscape management
- From United Kingdom: the Village Design Statement and the Landscape Character Assessment
- From Spain the case of Landscape Observatory of Catalonia is taken in consideration
- From the Netherlands the SPEL methodology and the Agenda Landschap are described
- A European project, HeriQ, underlines the connection between the heritage interpretation and the actions for sustainability in the landscape

After have deepened the features of stakeholder participation in the decision-making process aimed at the landscape management, here a wide series of case studies from Europe is given in terms of best practices, where the community engagement is considered a central node for developing a sustainable and durable landscape management starting from people's perceptions, needs and desires. It has to be noticed that the main issue of stakeholder participation in the decision-making process is very wide and these case studies are reported not to be criticized, neither they are an

exhaustive sample in terms of methodologies applied for managing the landscape (mostly considering the rural one) by involving stakeholders, rather they represent some “interesting windows” through which looking at to understand in what direction “the role of people in the landscape” is going to take.

2.2.1 Village Design Statement (UK)

In 1996, the Countryside Commission introduced the Village Design Statement (VDS) as a tool for addressing and planning the landscape at local scale, in the name of counteracting the standardization process in the rural areas towards territorial urban models. The Countryside Commission assumption was that the rich and varied character of rural settlements forms an important part of the beauty and distinctiveness of the English countryside; this character was under increasing threat from homogenization and poor design of the landscape; so it needed new mechanism for understanding and influencing the rural planning focusing on the regional diversity, local distinctiveness and harmony amongst buildings, settlements and the wider landscape setting (Countryside Commission 1996). The problem was not about whether development should took place; the concern was about how planned development should be carried out so that it was in harmony with its setting and contributes to the conservation and, where possible, enhancement, of the local environment. In this perspective, local communities have a unique appreciation and understanding of their own place, so VDS is based on this knowledge. It describes the qualities and characteristics that people value in their village and its surroundings, it sets out simple guidance for the design of all development in the village, based on the character and it is an advisory document produced by the village community, not by the local planning authority.

What does “character” mean? According to the VDS philosophy, a character is every element that people can describe as identifying the surrounding countryside and it can refer to the landscape setting of the village, the shape of the settlement or the features of the buildings. For local people the village is much more than a collection of individual buildings. It is the sum of all the buildings, spaces, streets and trees, it is where they live and work, it is the material heart of the community. That is why VDS push people to

organize the information under headings such as physical and natural influences, patterns and shapes of the village, its buildings and spaces, local landmarks and special features, roads, streets and pathways and changes and village evolution.

Considering the capacity of identification and description of the landscape characters by people, with the VDS the community has a great opportunity to get involved in the planning process at an early stage and to make a positive contribution rather than just responding to proposals. The earlier people participate in the planning process with the local authority, the greater their occasion for constructive influence the future policies regarding their own landscape. In this sense, the VDS is a strong tool for driving the direction towards to the land use planning works at local scale, through the approval of a Supplementary Planning Guidance, a tool for governing the socio-economic and territorial transformations, by providing advantages to the environment, the communities and the landscape perception (Voghera 2011). Furthermore, the VDS can be considered a real planning tool able to reach and act on those places that usually are poor of designing, such as the rural landscape, respect to others characterized by a higher appeal in terms of social, economic and recreational benefits, like national parks and protected areas in general.

To make this real, the VDS works including a broad participatory process, which integrates different methodologies, with workshops and consultation where people and experts can meet, share ideas and projects and plan together. Indeed the entire process is characterized by: public presentations, sharing ideas and local views of the villages buildings, spaces and settings in the landscape, assembling and recording the local characters of the landscape, exposing preliminary surveys, agreeing the future action, management, drafting and the process of consultation. All along these steps, the local community is able to design projects based on its own identity, by interpreting the rural landscape characters and translating them into priorities and needs. In this way, people can contribute actively to manage the territory next to the government actors, by interpreting the present and building up evolutionary scenarios.

For example, according to Countryside Commission, the farmers and landowners are called to strongly act for maintaining the characters of rural landscape around the

villages. This is an important engagement for them, because changing in agricultural techniques inevitably alter the appearance of the countryside, and this is the main factor that determined the transformation of the English rural landscape in the last decades (as it happened in Italy too, see Chap. 1). Therefore, the participation process built by the VDS is important also to encourage farmers and managers to consider the way that their activities, such as hedgerow management or the siting of new farm buildings and storage areas, affect the setting of the village and the surrounding landscape.

In conclusion, the Village Design Statement would promote a direct involvement of local people for identifying and defining shared policies aimed at the landscape management, which relate with the material, regulatory and perceptive sphere. Stakeholder participation allows recognizing the social perception and appreciation of places, to sensitize people about the meanings and roles of the rural landscape, and to reinforce its multiple values. Therefore, the VDS reveals itself as a tool of community interpretation of the landscape, and it lets read the local and collective meaning of places, spaces, symbols above which the uniqueness and identity are found.

2.2.2 Landscape Character Assessment (UK)

The Landscape Character Assessment (LCA) is an approach developed in UK subsequently to other national and regional initiatives for implementing policy tools for regional development, physical planning, land use, rural landscape planning (such as the VDS described above) and nature protection, sectorial resource planning and sustainability impact assessment. It aims at understanding what the landscape is like today, how it came to be like that, and how it may change in the future. Its role is to help ensure that change and development does not undermine whatever is characteristic or valued about any particular landscape, and that ways of improving the character of a place can be considered. It can be a powerful tool to aid the planning, design and management of landscapes. The character is a distinct, recognizable and consistent pattern of elements in the landscape that makes one landscape different from another, rather than better or worse (Swanwick and Land Use Consultants 2002).

The LCA is based on four principles through which it is applied:

- The emphasis placed on landscape character. Particular combinations of geology, landform, soils, vegetation, land use, field patterns and human settlement create character. Character makes each part of the landscape distinct, and gives each its particular sense of place. Therefore, the characterization is the process of identifying areas of similar character, classifying and mapping them and describing their character.
- The division between the process of characterisation (which is a free-valued process) and the making of judgements to inform decisions. The characterization embraces the practical steps involved in identifying areas of distinctive character, classifying and mapping them, and describing their character. It concentrates on making clear what makes one area different or distinctive from another. Instead, making judgments means to inform particular decisions related to the type of application, for example, the preparation of planning policies, and strategies for the conservation and enhancement of landscape character, or feed into broader decision-making tools and strategies where landscape is only one of a broad range of environmental issues under consideration.
- The roles for both objectivity and subjectivity in the process. The LCA contemplates objective inputs for mapping and describing the landscape types, and measuring the respective attributes and quantitative data; at the same time, it comprehends the judgments and values that people can express regarding a certain landscape and these judgments derive from people's needs and expectations. The important thing is that everyone involved in the process, or in the use of an assessment, understands which elements of the landscape are relatively objective and unlikely to be disputed, and which ones are more likely to be viewed differently by different stakeholders. There is also scope for a wide range of stakeholders to contribute to characterisation, each contributing their own judgements about variations in character.

- The potentiality for application at different scales. LCA can be applied at a number of different scales from the national to parish level. Ideally, assessments at different scales should fit together as a nested series or a hierarchy of landscape character types and/or areas so that assessment at each level adds more detail to the one above. The three main levels at which LCA are carried out are the national and regional scale (e.g. the entire country or large regions), local authority scale (e.g. county, district or unitary authority level) and local scale (e.g. individual parish, an estate or farm, a country park).

A specific LCA field of application is the landscape transformation by using two different indicators: the capacity and sensitivity of the landscape. The landscape capacity refers to the degree to which a particular landscape character type or area is able to accommodate change without significant effects on its character, or overall change of landscape character type. It is evident that studies on the landscape capacity, therefore, are designed to identify which possible transformations might affect a change in the landscape character (Gissi 2011). While the landscape capacity is defined according to the type of change, the landscape sensitivity is related to the stability of the landscape character, which means the degree of how much that character is strong enough to stay and recover itself in case of loss or damage.

The LCA is a process made by 6 steps, of which four in the “characterization” stage and 2 in the “making judgments” stage.

1. Defining the scope, because it can critically influence the scale and level of detail of the assessment, the resources required, those who should be involved in its preparation, and the types of judgements that are needed to inform decisions.
2. Desk study that involves review of relevant background reports, other data and mapped information, and use of this information to develop a series of map overlays to assist in the identification of areas of common character.

3. Field survey to test and refine the draft landscape character types/areas, to inform written descriptions of their character, to identify aesthetic and perceptual qualities, which are unlikely to be evident from desk information, and to identify the current condition of landscape elements.
4. Classification and description to refine and finalize the output of the characterisation process by classifying the landscape into landscape character types and/or areas and mapping their extent, based on all the information collected.
5. Deciding the approach of judgments that will be needed to meet the objectives of the assessment, by choosing the criteria to be used and the information needed to support the judgements to be made. Decisions will be needed on the role to be played by the stakeholders.
6. Making judgments depends by the nature of the outputs that may result from the process of landscape assessment and its purposes.

The development of the LCA, a so logical, holistic, spatially comprehensive systematic and integrated approach, derives from the concept that the landscape is about the relationship between people and place and it provides settings for our day-to-day lives. It results from the way that different components of our environment - both natural (the influences of geology, soils, climate, flora and fauna) and cultural (the historical and current impact of land use, settlement, enclosure and other human interventions) - interact together and are perceived by us (Swanwick and Land Use Consultants 2002). This definition of landscape is very close to ELC one and, in the same way, the strength point of the LCA approach is right found in the role of people's perceptions, which turn land into the concept of landscape (Figure 1). This is not just about visual perception, or how we see the land, but also how we hear, smell and feel our surroundings, and the feelings, memories or associations that they evoke. Landscape character, which is the pattern that arises from particular combinations of the different components, can provide a sense of place to our surroundings.

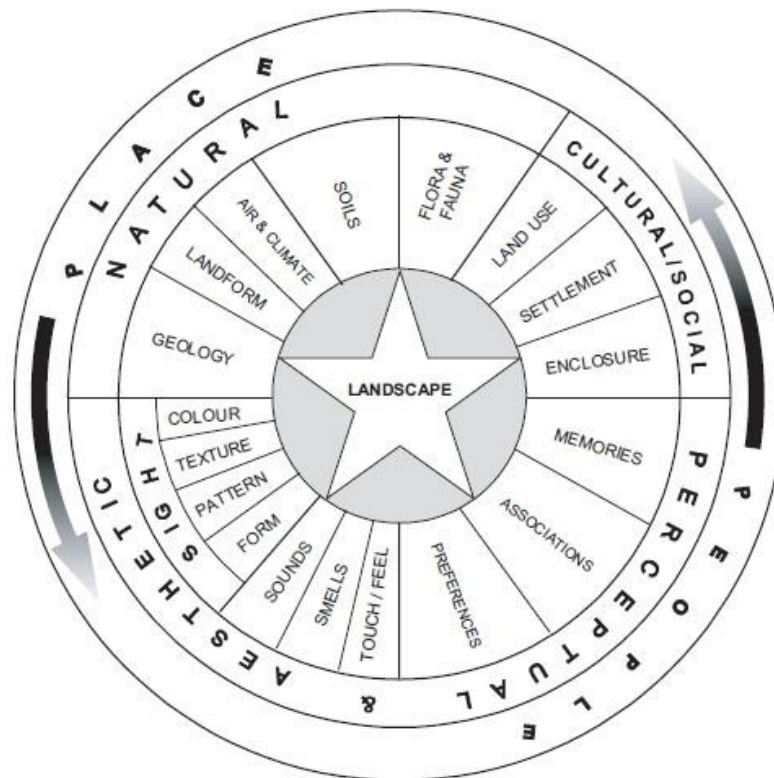


Figure 1 – A representation of the landscape concept as it seen according the LCA approach (Source: Swanwick and Land Use Consultants 2002).

The preeminent role of people’s perception in the landscape issues makes the LCA very focused in the stakeholders’ importance in the assessment process. Indeed, their involvement can produce a more informed valuation, greater ownership of applications, and establish valuable partnerships for future work. The term “stakeholder” describes the whole range of individuals and groups who have an interest in the landscape. This may be through their direct involvement in management of the land, through their knowledge of and interest in a particular subject, or because they have an attachment to a particular place, as residents or visitors. This emphasis fits well with government requirements for local authorities to develop approaches to community planning, cultural strategies, and best value performance plans and indicators. For LCA, the range of stakeholders is wide and can be divided into two broad categories, both of whom should be involved: the communities of interest and the communities of place. The first one is constituted by the many different groups who have an interest in the landscape, from a variety of diverse

perspectives, such as government departments, government agencies, local authorities, and non-governmental organizations. The second one is made by the individuals who live or work in a particular area, or visit it, who can be considered the bearers of the greatest “stake” in their local environment.

According to LCA vision, the stakeholders involvement in the assessment process bring multiple advantages (which ones can be brought back to the paragraph 2.1):

- The process can help people to understand and be aware of the landscape, to celebrate its character and diversity, and to develop confidence in community action.
- Valuable information may be contributed by stakeholders, which would not otherwise come to light.
- If stakeholders are involved in the process of reaching decisions about the landscape, they are more likely to be committed to the outcome.
- The process of participation can help to build consensus where previously none might have existed.
- Involving stakeholders in LCA can help to deliver resultant strategies, which need a variety of people and organizations to implement the guidelines.
- As Warburton (1998) underlines, stakeholder participation makes environmental initiatives more efficient, approachable and sustainable.
- Stakeholder involvement accords with government requirements for local authorities to deliver community planning, cultural strategies and best value performance plans and indicators.

The methods to carry out stakeholder participation in the LCA vary widely, particularly in terms of the degree of influence of the stakeholders in relation to the professionals involved (Scottish Natural Heritage 1999). Indeed, it can have: simply receiving information, being consulted, joint decision-making, joint action, independent stakeholder action, etc. Moreover, there are many methodologies that LCA approach contemplate for involving stakeholders and some examples are: Village Design

Statements (about which it is discussed above), Parish Maps, Local Sustainability Model, Small-group Workshops, Visioning conferences, etc. (Swanwick and Land Use Consultant 2002).

Deciding in principle to involve stakeholders in LCA is only the first step. Decisions must be made about which stage, or stages, of work they will participate in and how this will be achieved. Furthermore, it is important to find the best ways of involving stakeholders within the available time and resources. Ideally, stakeholder involvement should occur during the characterisation stage and continue into the stage of making judgements.

In terms of results in UK, LCA has been used for mapping Landscape Character Areas and Landscape Character Types¹³ at different spatial scales. In 1996, the former Countryside Commission and English Nature, with support from English Heritage, produced The Countryside of England map, which comprised 159 unique character areas. The joint character areas were identified by professional judgment, validated by consensus and informed by multivariate analysis of map information. Then, in 1999 the Countryside Agency commissioned the development of a National Countryside Character database and Geographical Information System. The aim of the database was to identify, on a consistent basis, the key characteristics of each area, in order to assist the targeting of agri-environment schemes. This study developed the National Landscape Typology (NLT) for England that comprises 79 generic Landscape Character Types and a total of 587 individual Landscape Character Areas across England. As in England, Scotland has seen since the mid-1990s parallel development of LCA for identifying and mapping the Landscape Character Types. Thirty-one regional reports identified both Landscape Character Areas and Landscape Character Types, covering the whole of Scotland. In total 3,967 areas were mapped, that were allocated to 366 Landscape Character Types. The

¹³ Just to be clear in the definitions: Landscape character types are distinct types of landscape that are relatively homogeneous in character; they are generic in nature in that they may occur in different areas in different parts of the country. Landscape character areas, by comparison, are single unique areas and are the discrete geographical areas of a particular landscape type (Van Eetvelde and Antrop 2009).

work was at first piecemeal and variable in its working methods (Swanwick and Land Use Consultants 2002).

As it is evident, these results are tools very complex but, in the meantime, useful for having both a broad and detailed view on the UK landscape for planning policies and programs aimed at its conservation, valorization or, even, transformation.

Wascher (2005) examined the appropriate literature in the landscape science, geography and spatial planning and observed that the concept of character of landscape is likely to play a significant role as an assessment criterion, as a development objective or simply as a descriptive notion. Thus, the wide use of the term seemed to reflect the need to respond to the specialness and diversity of places. However, these popular usages of the term “character” are also associated with some significant intellectual challenges: the “character” of a landscape might be a ubiquitous phenomenon, in the sense that there is character in everyone, everything and everywhere, is in juxtaposition to the “specialness” that “landscape character” seeks to single out. Moreover, if identifying the “character” is mainly a question of human perception and of the human capacity to perceive a significant level of details, how much then does landscape character qualify for becoming associated with a scientifically stable reference framework and an accurate analytical tool for spatial planning, sustainable land use and environmental sciences? This question is a key challenge when developing landscape assessment techniques at the European level. Indeed, the LCA was very successful because it ended up in concrete policies and actions for UK, but, even if it is considered a good model for assessing and mapping the landscape at different scales, it should be not taken as a “universal” methodology applicable also in other European countries.

In this context and under a new European ferment for the landscape issues, from 2003 to 2005 the project ELCAI (European Landscape Character Assessment Initiative), financed by EU under the 5th Framework Programme on Energy, Environment and Sustainable Development, was carried out just for examining the origin and use of “landscape character” or “Landscape Character Assessment” throughout 14 countries. ELCAI mainly concerned with the way that the participating countries make and made use of landscape character maps, typologies and indicators and how these national

approaches relate to European initiatives, also for analyzing the role of policies and stakeholders at various levels. In the light of increasing landscape changes, many national agencies have developed sophisticated Landscape Character Assessment tools that are scientifically sound, region-specific and stakeholder-oriented – qualities that are considered as key issues for the future implementation of the EU policy and research agenda as well. Another output from ELCAI project was to generate a core set of landscape indicators for wider policy implementation, and from this experience emerged a high variety in the way of conceptualize and represent the landscape in terms of indicators by all the different countries involved (Haines-Young and Potschin 2005). This is because there is a difference in the factors that are considered at the base of the landscape character typologies of each country. However, every type-set was built to express the same four group of aspects to investigate: morphology and biophysical functions of the landscape, anthropic action in shaping the landscape (cultural aspects), landscape experience (perceptive and aesthetic aspects), view points of the local communities. As to say, the diversity of Europe in terms of landscape is reflected in the different ways (in terms of indicators) to assess it by their country governments, and even the features, or better, the characters, to identify are almost the same.

2.2.3 Landscape Observatory of Catalonia (Spain)

An important experience regarding a big effort for assessing and valorizing the landscape at regional scale (that became a sort of model for many other European countries) comes from Spain, with the Landscape Observatory of Catalonia. Like in UK, even in this case the need that brought the regional government to establish an entity to deal with the landscape issues was the negligence, homogenization, and the loss of identity concerning many Spanish landscapes, even though their total richness was still remarkable, to be opposed with a new planning and management in the framework of the sustainable development. The new social awareness for the landscape that invested throughout the Europe during 2000s involved also Spain that promulgated the Law 8/2005, on 8 June, on the Protection, Management and Planning of the Landscape. The Landscape Observatory is designed both as an advisory body of the Regional Government

of Catalonia and of society in general in matters of landscape, as a center of excellence for the study and monitoring of the evolution of Catalan landscapes and of actors that influence their dynamism.

One of the most important points of excellence of the Landscape Observatory is just the community engagement since its beginning work. Indeed, the aim of openly endorsing participation was to involve people and institutions in landscape policies to make them describing and evaluating the landscape, understanding the dynamics, which transform it as well as the opportunities, potentials and risks, and contributing with ideas that will have an influence on its future. At the same time, there was the purpose to make the most of the process as a widespread education about landscape values and participation.

The Landscape Observatory has got many functions: establish criteria for the adoption of measures of protection, management and planning of the landscape; establish criteria to determine the landscape quality objectives and the actions needed to achieve them; establish the mechanisms for identifying and observing the evolution and transformation of the landscape; propose actions directed to the improvement and restoration of the landscape; carry out the catalogs of the Catalonia landscape designed to identify, classify and evaluate the different existing landscapes; promote social awareness campaigns with respect to the landscape, its evolution, its functions and its transformation; stimulate the scientific and academic collaboration on the landscape issues; organize events and programs aimed at the landscape education; create a documentary center open to all the citizens who care about the landscape. Furthermore, the Observatory has to carry out a landscape state report in Catalonia every four years to be presented to the Parliament by the Catalan Government (Nogué 2007). This report must be informed by a set of landscape indicators, which cover three basic needs. In the first place, the indicators must describe, in a simple yet rigorous way, the reality of the landscape in Catalonia, fully contributing to the identification of problems, furthering the knowledge of existing challenges in relation to landscape conservation, management and planning, and enabling research and the finding of suitable and flexible solutions. A second function of the above-mentioned indicators is that of evaluating the effectiveness

of the actions of the various levels of the administration in the area of landscape, providing clear signs of the success or failure of those policies adopted and guiding decision makers towards issues of priority in the area of landscape. Finally, landscape indicators must communicate clearly and precisely about the features of landscape to the citizens of Catalonia, in order to facilitate and improve their understanding. Besides, these indicators must contribute towards raising awareness and educating the population (Sala 2009).

This is in accordance with the new culture of landscape and territory that characterizes throughout Europe and internationally, in which more and more importance is given to the perceptual and social dimensions of the concept of the landscape indicators, and which take into account both the quantitative and the qualitative aspects in spite of the difficulties this entails. However, this perceptual dimension is closely linked to subjectivity, and for this reason it constitutes an obstacle to an easy solution to the request of indicators, above all because of the incommensurability of the majority of perceptions and sensations of the population, which make this task hugely difficult. Taking into consideration this, ten indicators as a proposal for assessing Catalonia landscapes have been defined. This proposal is unavoidably generic, given the incredibly high level of landscape diversity in Catalonia. Besides, a reduced list of indicators has been chosen in order to guarantee their effectiveness and to link very closely landscape indicators with objectives of landscape quality defined for Catalonia as a whole.

1. Transformation of landscape: analysis of changes in the natural and cultural characteristics of landscape, which alter its value or its appearance.
2. Landscape diversity: evolution of the richness of landscape configurations.
3. Landscape fragmentation: the result of a process of breaking and splitting into pieces the continuity of a landscape and its coherence.
4. Economic value of the landscape: the capacity of a landscape to convert its features into productive resources of diverse economic value.

5. Knowledge of the landscape: the level of recognition and interaction with the landscape which a given population experiences.

6. Landscape satisfaction: the level of satisfaction or dissatisfaction with their landscape of the population living in a given area.

7. Landscape sociability: makes it possible to ascertain social relations in its widest sense in relation to the landscape and generated by the landscape.

8. Landscape and communication: approximation to the communicative dimension of the landscape.

9. Public and private action in the field of conservation: monitoring public policies and private actions in the field of landscape conservation, management and planning.

10. Application of instruments of the landscape legislation: an indicator focused on the degree to which instruments such as landscape catalogues or landscape guidelines have been implemented, therefore evaluating their real contribution to public policies in landscape conservation, management and planning.

Landscape indicators are in the interface between science and management, between generating knowledge and political practice. Therefore, we can consider indicators as valid if they are useful for making good decisions.

The Landscape Law establishes the landscape catalogue as an instrument for introducing the landscape into spatial planning in Catalonia, as well as into sectorial policies (agriculture, infrastructures, culture or tourism, to name a few). The catalogues are tools which enable to understand what the landscape is like, its values, the elements, which determine that a landscape is of a certain type and not another, and how the landscape develops according to economic, social and environmental factors. Finally, they define the kind of landscape that society wants, and what needs to be done to achieve it. The landscape catalogues, in accordance with the ELC, are based on a holistic vision of the landscape, taking into account natural and cultural elements at the same time, and never separately. It is the geographic physiognomy of a territory with all its natural and anthropic elements and, also, the feelings and emotions that are generated in the process of contemplating it. The catalogues also perceive the landscape as the cultural projection

of a society in a specific place from a material, spiritual, ideological and symbolic perspective (Nogué et al. 2009).

By attributing all these meanings to that tool, it appears clear that a landscape catalogue needs a wide variety of expertise and professionals to be included in the working group, such as specialists in the field of landscape analysis, management and intervention, as well as in land use and urban planning, and specialists in social and public participation systems. However, the Landscape Observatory of Catalonia is made to be participative since the beginning stage and, because there is the lack of an agreed methodology for characterizing and assessing the landscape (even at European level) a basic conceptual, methodological and procedural norm were established for developing the seven landscape catalogues of Catalonia in a coherent and coordinated way. The methodology envisages four developmental stages each of which is accompanied throughout by participatory processes.

- Identification and characterisation of the landscape. The aim of the first stage was to identify territorial areas with similar characteristics, on the basis of the natural, cultural (tangible and intangible) and visual elements which make up a landscape, as well as the more subtle and symbolic elements which define it. The result was the division and classification of the land into areas with the same character, which are defined as landscape units (or landscapes) and 135 were identified in the Catalanian landscape. With the intention of bringing landscape closer to the people, they were classified according to the most popular and common ways of perceiving them, after an intense process of public consultation and participation. At each landscape, as a result, was given a name that is well rooted in the local community and which belongs to the collective historical memory. Once the units were identified, they were mapped and their character was described, specifying the values and dynamics, which had influenced and were currently influencing their transformation, either as a result of natural causes or socio-economic factors. During this stage, it was also essential that through the process of public participation viewpoints and walking paths could be identified, as well as the most important tendencies and those values related to sensory or

emotive perception or to a sense of belonging —elements which are impossible to grasp from the analysis of current established forms of mapping or from fieldwork.

- Landscape assessment. The second stage, that of assessment, consisted of studying the threats and opportunities for the landscape, taking into account its configuration, evaluating the dynamics and factors which have an influence, as well as looking into how it may change in the future. This exercise took place unit by unit and for the whole territory. Participation in this stage played a role in improving the landscape assessment carried out by the team who developed the catalogue and in noticing distinctive features of the local environment that may get missed out in a more general study. Moreover, participation also helped to reflect on the importance of the threats and opportunities that were detected.
- Definition of landscape quality objectives. The next stage in developing the catalogues consisted of defining landscape quality objectives, which are the expression of the landscape preferences of a society, after understanding its state, values and risks. Landscape quality objectives respond to the question “What kind of landscape do we want?” and they do this based on the opinions gathered during the participatory processes, from citizens and from the main social and economic agents in each territory. Based on the information collected in the two previous stages, and above all via public participation, landscape quality objectives for each landscape unit and for the whole territory were defined. The main challenge in this stage was to enable citizens and landscape agents to express their hopes and desires with regard to their landscape.
- Establishment of proposed criteria and actions. For each landscape unit this stage proposed criteria (or measures, in the terminology of the Landscape Law) and actions to put into effect the landscape quality objectives defined in the previous stage, by implementing different projects or initiatives. Due to their complexity and their technical component, the level of public participation in the process of establishing criteria and proposals for action was much lower than in the other stages of developing the catalogues. Nevertheless, participatory

processes related to establishing criteria and actions were carried out, but it was necessary to help the participants that were not experts in this subject.

Although in many cases public participation is understood more as a goal than a tool (as it has evidenced in paragraph 2.1 of this thesis), the Landscape Observatory considers it to be a means of improving and legitimizing the landscape catalogues, of sensitizing people to landscape issues, and of guaranteeing the democratic quality of the process.

The participatory procedures in the Landscape Catalogue of Catalonia were addressed primarily to two types of interlocutors: landscape agents (the experts' category) and members of society as a whole (the local communities). In total around 5,000 people took part in the various participatory processes of the seven catalogues. During the carrying out of all the landscape catalogues, various participation methodologies were used to involve people at different level and in different stages, such as: the telephone survey used to get an initial sense of how citizens perceive the landscape; the opinion poll consisted of a series of door-to-door interviews carried out with the aim of getting a sense of how the population perceive, experience and value the landscape, as well as their aspirations for it; the public consultation via the web by the Landscape Observatory website¹⁴ to identify citizens' values of the landscape and to contrast some of the results obtained by the team who developed the catalogues; the interviews with landscape agents were in-depth moments carried out in order to find out their opinion on key issues, values, characteristics and challenges related to the landscape. Other methodologies used were discussion group, workshops with landscape agents, with individuals and open workshops.

In general, the participatory process results were successful and useful for identifying those values that are imperceptible from the cartographic analysis or the fieldwork (Nogué 2007). These values regarding the landscape are mostly the intangible ones (a safe landscape, a wild one, a quiet one, etc.) the symbolic and identity values.

¹⁴ www.catpaisatge.net [Last consultation: 02-28-2015].

Moreover, the interviews were helpful for validating and disputing some results obtained by the technical work, while the consultation via web and the discussion group gave an important spur to sensitize people to the landscape issues.

This experience demonstrated that participation enriched the landscape catalogues. The information obtained in the participatory process had an influence in various ways; some of the contributions were very difficult to detect while others were easily identifiable in the final document. Each contribution had its own specific influence, independently of its level of representativity. In this way, any single opinion, if it made a good point, could have an influence on the catalogue. Whether or not the contributions of participants were included in the text of the catalogue did not depend so much on questions of representativity, but rather on whether these contributions made sense and were validated by other participatory methods or by other means (Nougé et al 2009).

That experience was very significant, the first one of its kind (in terms of landscape observatory), because it brought together citizens and public administrations for making decision regarding protection, management and planning of landscapes. It teaches the lesson that without public participation, it is not possible to advance towards a new territorial culture based on the sustainable management of heritage and natural resources and on a new relation and understanding of landscape as a whole.

2.2.4 Methodologies in Netherlands: the Scales for Perception and Evaluation of Landscape and the Agenda Landschap

In Netherlands, it reports a long research tradition regarding the management of the landscape through participative methodologies, based mostly on the perception assessment of people. An important work has been made by the psychologist Coeterier, who spent many years of research to find a set of attributes that determine landscape perception in Netherlands. According to his studies (Coeterier 1996), he found that, despite great physical differences between the regions he investigated, the inhabitants agreed on some salient attributes: the nature of the landscape as a whole (unity), its function (use), maintenance, naturalness, spaciousness, development in time, soil and

water, and sensory qualities such as color and smell. These can be considered the basic qualities of the Dutch landscape. Unity and use of the landscape always come first in people's perception of the most landscape elements, then, these two attributes determine the significance of the others. The usefulness of this study is to implement different planning procedures by using these landscape attributes as they were perceived by people.

The same author developed a methodology called Scales for Perception and Evaluation of Landscape (SPEL) by using interviews for investigating the individual landscape perception (Coeterier 2000). On the basis of twenty years of questionnaires experience elaborated by the author to find out the social, physical and functional factors that influence their landscape perception, the SPEL questionnaire measures the appreciation of attractiveness of the landscape by considering eight basic qualities of the landscape: unity, use, own use, naturalness, historical character, spaciousness, management, and sensual experience; the methodology consists of carrying out a poll every three years (Farjon et al. 2009) for monitoring the evolution of these quality factors.

SPEL methodology is applied in a large number of regional case studies in the Netherlands and to a national monitoring program of landscape qualities of the Netherlands Environmental Assessment Agency (Van der Heide and Heijman 2012). In 2006, this Agency approved the landscape planning at national scale (VROM 2006) by developing programs and methodologies for assessing the material, regulatory and perceptive spheres of the landscape, including its ecological-environmental, physical, social, functional and aesthetic aspects. After the approval, the Netherlands Environmental Assessment Agency conducted the monitor program about the perception and appreciation of the national landscape by using the SPEL methodology and by involving the experts' judgment and people's opinion to understand which factors influence the quality and the social appreciation of the landscape. In this specific case, the expert knowledge has been synthesized in the physical and morphological characteristics of the Netherlands landscape, at which people's perception has been associated. The latter has been obtained through a series of interviews by using pictures to let emerge

which physical elements people can appreciate about the national landscape. This investigation demonstrated that the 75% of Dutch people appreciates very much its own residential places and this appreciation decrease at the increasing of the distance from home (Farjon et al. 2009). Instead, some differences in landscape appreciation can be explained by social and physical factors. About the former, on the one hand, the non-native people among those polled (born abroad or whose parents were born abroad) had less appreciation for the landscape than the natives; on the other hand, the older the people that were polled the higher was their satisfaction with the landscape. This led to the conclusion that landscape appreciation is closely linked with its use: non-native and young people use the rural environment for leisure purposes less frequently, and therefore their interest and hence their appreciation is lower. These results mean, first, that immigration and the aging of society can have more of an influence on the assessment of landscape appeal than physical changes. Secondly, the landscape appreciation may be influenced by the promotion of its use with leisure purposes. As for the physical factors, the results of the study show that the natural character, unity and historical identity are the most relevant factors influencing landscape appreciation. Furthermore, a factor not present in the initial SPEL questionnaire, but that was considered relevant enough, was that to analyze the changes in landscape. Specifically, people polled were asked if they had observed changes in the landscape of the area that they had been requested to assess, and it was found that this factor made it possible to explain variations in appreciation. In fact, those who had witnessed an increase in infrastructures, industrial estates and residential areas had a much more negative view of the landscape appeal than those not referring to this kind of transformations. This led to the identification of three main sets of intrusive elements that have a clearly negative influence on landscape appreciation: infrastructures, big buildings (commercial buildings, greenhouses, big farming buildings), and high-rise structures (high-voltage lines, wind farms and high-rise buildings). Moreover, the results showed a clear relation between the landscape beauty, identifying the residential places, and the regulatory positivity associated to the restrictions of the planning tools (Voghera 2011). It means that when a landscape is perceived with high aesthetic values, the reasons to protect it with bindings are well accepted. Recognizing protected landscapes at national level allowed the Agency

to go one-step forward and assess the perception of the possible transformations made by new potential infrastructures, such as the wind turbines. About this issue, the results demonstrated that those artificial elements (wind parks, high voltage lines, roads, electrical cables, etc.) have a negative impact on people's perception.

This interesting methodology allows to experiment how the interpretation of perception values regarding the quality of landscape can be used to map, at national scale, and then going downscaling at provincial level, the areas with a low value of appreciation (because the presence of infrastructural impacts), about which new projects of transformation need to be implemented. In this sense, people's participation can contribute to create a new landscape identity, by encouraging territorial and environmental studies to plan that new landscape, with characters that need to combine both the appreciation of society and the economic development and sustainability; sometimes the compromise is obligatory, as in the case of the wind turbines, which were not appreciated by Netherlands's people in general, but were built to make the country effective under the energetic point of view.

The results emerged from the monitoring program made by the Netherlands Environmental Assessment Agency regarding the landscape perception and appreciations (and its subsequent requests made by the society to live in a better quality landscape) led the drawing up of *Agenda Landschap* (VROM and LNV 2008). The Agenda aim is to lead the Netherlands society to a sustainable and aware use of the landscape, inviting people to participate actively to its transformation, protection and management, even under an economic point of view. Indeed, in Netherlands, the landscape is considered an economic value (instead, this is not a true concept in Italy) above which public and private investments are needed. In practical terms, the Agenda Landschap addresses to increase the average score given by people to the landscape perception during the monitoring program from 7.3 to 8 within 2020 by implementing projects and politics on the national territory respect to three strategic action axes: the careful use of land space, the landscape for everybody and the financial tools.

In terms of concrete actions, the Agenda transfers its strategy at provincial level with a series of tasks:

- Protect and valorize some landscapes which views are threatened by commercial and industrial infrastructures.
- Drive the protection and maintenance of the rural landscape, conceived as a heritage entrusted to the farmers.
- Reorganize the fruition of many landscapes characterized by a high value of national identity.
- Control the urban development by the establishment of buffer zones with a character of naturalness to contain the expansion of anthropization.
- Activate project to valorize the suburban landscapes by linking the residential, productive and commercial activities in terms of green economy.

Another participative stage of the Netherlands landscape management strategy is to involve people in events aimed at evaluating the projects and programs already carried on in coherence with Agenda Lanschap framework. In these occasions (been started since 2009), people's understanding is facilitated by using easy communication tools, presentations, lectures centered on the landscape education (mostly for kids), advertising campaigns, etc. It is important to evidence that this type of community engagement is mostly a consultation about some issues already prepared by experts (the projects regarding the landscape), rather a very participative process.

2.2.5 HeriQ Project: the heritage interpretation in the landscape management

The last European case study brought to the attention relates to a different perspective to which look at in terms of community engagement as a precious tool for enhancing the landscape management, which is the education and effective communication thanks to the implementation of the heritage interpretation.

It is worthy to present briefly this approach. Heritage interpretation was introduced in the 20s of the twentieth century by the American National Agency for Parks (National Park Service), it is now a well-codified approach, especially in Anglo-Saxon countries, and it is widely used in all those activities that require communicating with the public. The

conceptual basis of the interpretation and its pedagogical dimensions find their first expression in the publications of Freeman Tilden (1957). According to the author, thousands of naturalists, historians, archaeologists and other specialists are responsible, among other things, to disclose to the visitors of the parks or other places of interest something beautiful and wonderful, the inspiration and spiritual meaning that is behind what the person can perceive with their senses. The interpreters are therefore the guardians of the "treasures of the earth", which must be brought to light and associated with the perception of the individual through the personal interpretation. He defined interpretation as "an educational activity which aims to reveal meanings and relationships through the use of original objects, by firsthand experience, and by illustrative media, rather than simply to communicate factual information" (p. 33). More in depth, he thought that to understand what we mean, we should not cling to it in a literal sense, because interpreting does not mean just translate information, studies and research, but communicate beyond appearance, reveal a broader truth that is beyond any factual situation, to benefit the mere curiosity to enrich the human mind and spirit. It means going over the vision of a part to tend toward the whole. If it transposes Tilden's vision about what interpretation can do into the landscape concept and meaning, it fits perfectly.

Furthermore, heritage interpretation is not only considered a technique to transmit educational messages, or a method to process information, but it's also entered fully in the planning process, specifically of parks and protected areas, being used as a very effective tool to help to achieve the fixed management objectives. In particular, the "interpretation plans" are designed for enhancing the governance of protected areas in general, and in particular to improve the quality and the organization of people's experience in the fruition of places. Properly in terms of planning, the heritage interpretation might be very helpful in the landscape planning process, because it can support the planning meetings with different stakeholders (interpretation as an effective communicative tool), the participative events like presentations, field trips and interactive moments aimed at building a shared vision (interpretation as a tool for uncovering view and thoughts with new eyes). In addition, it can lead the implementation of the projects aimed at the landscape valorization and transformation already approved by all the

parties. Thus, heritage interpretation brings several potentialities aimed at the landscape management and it can increase the efficiency of the results.

A European project is working right in the direction to spread out the heritage interpretation to improve people's sense of belonging to their own landscape, so to favor their active engagement in a sustainable future perspective. This project is called HeriQ¹⁵ that would mean quality in heritage interpretation. It is financed by EU Leonardo project (2013-2015), within the Lifelong Learning Programme, and its partnership involves Bulgaria, Germany, Greece, Italy and France.

The mission of the project is to stimulate development of distinctive heritage experiences by using interpretation for relating people to places, empowering them to achieve a sense of belonging in a changing world and helping them to shape a more sustainable future.

The objectives of the project are to introduce training in quality standards for heritage interpretation in vocational education and training curriculum of partners' countries, and to stimulate development of professional skills corresponding to the needs of sectors related to natural and cultural heritage.

HeriQ is to advance the idea that interpretive change agents can inspire and empower people and communities to cooperate and to share their heritage with visitors from abroad. Therefore, this project can be considered a good practice in the perspective of community engagement for improving the sense of belonging and action towards their landscape. To do that, trained people at principle and practices of heritage interpretation are needed, that is way HeriQ runs training courses to offer skills and materials to improve the careers of guides and to encourage the provision of excellence in guiding. This is supported by the training of interpretive agents, which main task is to develop ideas about how to empower guides, how to involve stakeholders, how to implement heritage interpretation through specific programs, and how to raise its quality in their own regional landscape. Because heritage interpretation uses a range of media but it is at its best when there is direct person-to-person contact, the project wanted to valorize, for

¹⁵ <http://heriq.org/> [Last consultation: 02-28-2015].

that reason, the prominent role of interpretive guiding by drawing up a manual, which is written right for interpretive guides to use all over Europe (Ludwig 2014). Because the project is intended to train interpretive agents who connect people to their heritage, to communicate responsible and sustainable thinking through the way they interact with people and places, interpretive agents are seen, thus, as facilitators of education in sustainable development, who encourage a viable balance between preservation and change. In this perspective, these professionals can achieve a main role in leading the participation activities along the landscape management processes, because they are able to create a strong link between people and their own landscape, according to the place-based education.

In the HeriQ vision, the education at sustainability constitutes an essential cornerstone towards which the heritage interpretation can give vitality, by turning the rich history and many stunning natural and cultural sites, which characterize many European landscapes, into sources of inspiration for improving the management of these landscapes. Indeed, a basic philosophy that inspired HeriQ project is that a deep relationship with our natural and cultural legacy, and a profound appreciation of this heritage, do play a vital role in shaping the sustainable future of our landscape.

2.3 Experiences from Italy

Contents:

- In Italy the community engagement in the decision-making process is still poor and not well understood in its potentialities, even if a new consciousness on this subject is growing right on the landscape issues
- Some sources of inspiration come from the few examples of landscape planning processes that include the stakeholders' participation, like the Landscape Plan of Tuscany Region and the PPTR of Puglia
- The Landscape Observatory is a sector of implementation of the community engagement practices for managing the landscape that in Italy is diffusing in the last decade

It is a few decades now that territorial planning literature has acknowledged that planning considered as a public policy cannot be practiced as a type of government set on hierarchical bases, but instead requires necessarily types of governance more or less sophisticated able to involve different stakeholders.

In practice, in Italy this theoretical awareness does not always correspond to an effective participation of different actors potentially interested in decisions that involve relevant territorial changes (Marson 2012). Mainly, there is a remarkable (and in some cases intentionally wanted) vocabulary confusion between the negotiation practices with the delegations of social and economic interests formally established and the participation process of citizens and their associations, both mentioned as examples of participation.

Despite the large experiences, so far the involvement of citizens and their associations in too many circumstances is still considered an optional practice: long, expensive and often out of control as far as its results are concerned. Therefore, too often it is not considered an effective exercise to improve the quality of public decisions, but rather something to possibly avoid, when not expressly requested. This still happens also regarding the landscape issues. Giving space to participation in the political and territorial landscapes requires a systematic approach that is not reducible to the traditional consultative procedures of the observations in zoning plans, and even the new instruments of environmental assessments, played once again almost exclusively on the relationship between administrators and experts (Sartori and Pirovano 2008).

The landscape planning is one of the sector particularly “courted” by the discourses regarding the participation, but which they are not able to influence yet the consolidated and repeated decision-making practices centered on an almost exclusive relationship amongst technicians, administrators and investors. Often, it speaks about landscape and spatial planning by absorbing the environmental sustainability and other types of sustainability (social, economic, political), and by translating it all with the formation of green wedges and ecological corridors, appropriate management techniques of waste from demolition and construction activities and infrastructure, energy saving initiatives. However, when the role of citizens is deepened in these situations in terms of their

functions, the strategies of management, development, conversion and recover of areas, a delusion often occurs because of scarce people's involvement (De Marchi 2005).

Despite these weakness points, in Italy there are some good examples of landscape planning processes carried out with effective and helpful participative approaches, as the ones that follow.

The first case comes from the Tuscany Region, that has a specific profile regarding participation derived from a regional law on territorial governance (1/2005), which provides for a peculiar figure, the “guarantor for communication” for citizens in relation to the different planning procedures, and by a good number of participation experiences promoted and financed by a specific regional law on participation (69/2007). Both these tools were introduced as a consequence of the new relation between Region and local authorities, consequent to the change of the V Title of the Italian Constitution, which makes municipalities responsible not only for the drafting, but also for the approval of its territorial planning instruments, leaving to the Provinces and the Region a quite limited power to make specific recommendations, but not modify them.

The consultation since a long time codified in the Statute of the Tuscan Region recurrent as a praxis along institutional decision processes has been therefore integrated with participation forms broadened to citizens and their associations. In recent years, participation experiences have thus started to develop in a quite articulated way, becoming a point of reference in territorial planning processes (Marson 2012).

At the end of 2010, beginning of 2011, Tuscany Region had started a review process of its Landscape Plan aiming at completing and improving the first “edition” which had only accomplished the first step of the formal approval process in 1999. Since 2012, the Region started a series of consultations. Then, the different scientific communities present in the region participated actively, their disciplinary contributions proved to be useful and in many cases essential to structure the knowledge systems on which the plan is founded. Then was the turn of a phase of definition and that will include public

meetings organized by sub regional macro areas, creating a network and making a record of the local experiments of community maps, that, in any case, need to be supported sufficiently by working materials specific enough to avoid simple descriptions of the directions already adopted. None of this shall be considered other than the start of a course, where the instrument of the landscape observatory (about which concept it will discuss deeper in the paragraph 2.3.2) represents an important challenge for the future. Required by the national Code and by the regional law, if conceived as an institutional node able to interact with a series of social and cultural energies articulated on the territory, the landscape observatory is able to foster the landscape planning in a participative way. The landscape observatories of Tuscany Region constitute a network with regional references and local ones, identified all by the Landscape Plan, to channel participation by local communities, both in the phase of knowledge of the Plan and in the evaluative phase, and to exert more influence in the decision-making process (Rubino 2013). The network is constituted by museums, ecomuseums, association of landscape producers, etc., and carries out actions to heighten awareness and involvement of local communities working with agencies, institutions, associations, and local experts. The goal is to activate places, both in the physical and functional sense, in which active citizenry and its associations cooperate with the local administration in order to wisely develop their territory and to manage the future of that landscape in a shared manner.

2.3.1 Regional Landscape and Territorial Plan of Puglia: an integrative participatory process

Another Italian Region that completed a well-structured and integrated process for carrying out the regional landscape planning is Puglia. In 2007, the regional administration started the drafting of a new landscape plan, consistent with the recent legislative innovations of that time (the Code of Cultural Heritage and Landscape, Law n. 42/2004). The aims were: setting up a tool able to recognize the main values of the Region territory; building up the shared rules of use and transformation that allow to maintain and develop landscape identities and values; raising the quality in terms of ecology, landscape and settlements; establishing the rules and designing conditions for

the landscape construction and, at the same time, a self-sustainable¹⁶ development of the territory.

The Regional Landscape and Territorial Plan (PPTR is the Italian acronym), approved on January 11, 2010 by the Regional Council of Puglia, has the following objectives:

- Activate the social production of the landscape
- Achieve the hydrogeomorphological balance of river basins
- Develop the environmental quality of the area
- Enhance the territorial durable figures of landscapes and promote the historic rural landscape
- Enhancement of the identity, cultural and settlement heritage
- Retrain the degraded landscapes of contemporary urbanization.
- Enhance the aesthetic and perceptual structure of the Puglia landscapes and its slow use
- Retrain and promote the coastal landscapes of Puglia.
- Establish standards of territorial and landscape quality in the development of renewable energy, in the settlement, rehabilitation and reuse of productive activities and infrastructure.
- Establish standards of construction, urban and territorial quality for urban and rural residential areas.

To reach these goals, the PPTR uses three main tools:

- The Atlas of Environmental, Landscape and Territorial Heritage that is finalized to the description of the region by recognizing the elements and rules of the

¹⁶ The concept of self-sustainability refers to the overcoming of the ecocompatibility concept, that is a model of development, which requires corrective and external props to be sustainable; the self-sustainability refers to a development model that finds in the reproductive rules of local resources the self-generative capacity of durability (Magnaghi 2010: 140).

relationship between human actions and environment, which are the identity characters of the Puglia territory.

- The Strategic Scenery that allows foreseeing the future characters of the Puglia territory at medium and long term.
- The Rules that consist of the Technical Standards of Implementation, which are a list of guidelines, directives and regulations that, after the adoption of PPTR, have an immediate effect on the use of environmental, settlement, historical and cultural resources that constitute the landscape.

In this general structure, a complex participative process inserts since the beginning of the PPTR development for converting the old conception of a landscape plan with a restrictive, conformational and authorization logic (even if these elements are necessary for protecting the landscape) to a conception of a project aimed at a socio-economic valorization of the landscape heritage of Puglia Region. Developing this project requires the active concourse of the most innovative institutional, economic, social and cultural energies that aim to the protection and valorization of the extraordinary qualities of the Puglia territory and to the “living people” for producing a development model of the Region centered on endogen, self-sustainable and richness-generator characters (Magnaghi 2009). In these terms, the area conferences played a central role in terms of community engagement, because they constituted the moments for activating paths of governance and participative democracy finalized at improving the PPTR development. These paths were:

- Interactive web site¹⁷, developed for reaching as many citizens, associations and producers as possible for a sharing construction of the landscape culture, valorization and protection actions. The web site is articulated in three sections:
 - The plan that informs about the activities of its developing phases

¹⁷ <http://paesaggio.regione.puglia.it/>

- The Atlas of Environmental, Landscape and Territorial Heritage (already cited above)
- The Observatory¹⁸ that allows creating, through a real interactive and participative way, a database of reports made by people and institutions about: landscape heritage sites, elements of landscape detracting, good and bad practices for landscape. All the reports are mapped by a web GIS software on the regional cartography layer, so to have a map of social perception of the landscape, as recommended by the ELC. Moreover, the results of the Observatory constitute a map of “active citizenry” useful for driving the general actions included in the PPTR (Lucchesi and Carta 2009). Indeed, every citizen, each big or small community of inhabitants can report in the Observatory such famous or ignored, historical or contemporaneous places that are considered precious, because are perceived as elements for improving the quality of the life experiences of everybody (Carta 2009). Especially those reports about everyday life places are useful for the PPTR, because the experts are not familiar with the judgments concerning these places. Moreover, extremely important are the reports concerning objects and places that people consider responsible of a neglect quality of landscape and for which actions of improving and requalification are needed.
- The agreement with the “landscape producers” (entrepreneurship associations in the agricultural, handcrafting, commercial, touristic, building, infrastructural and transport sectors) to decide, by drawing up a “manifesto of intentions” amongst Regional Authority and productive stakeholders, the actions to carry out in each sector, in the respect of the valorization of the landscape as a “common good”.
- The creation of prizes (in terms of landscape quality marks, benefits, incentives) for farmers and touristic operators who are able to safeguard and recover the

¹⁸ <http://paesaggio.regione.puglia.it/osservatorio> [Last consultation: 02-28-2015].

rural historic landscape, the rural traditional infrastructures and buildings, to valorize the places for the widespread hospitality in the ancient cities and villages.

- Calls for projects and institutional good practices by using a dedicated forum about the landscape.
- The activation of experimental pilot projects regarding the different themes consistent with the objectives of quality landscape and the process of governance and participation by establishing agreements protocols amongst the Department of Regional Planning and the different stakeholders of the territory. The results of the experimental pilot projects have a twofold value: starting the process of “social production” of the landscape plan by the territorial stakeholders; verifying the efficiency of addresses, directives and prescriptions of the landscape plan during executive phases of projects. The experimental projects have two typologies: institutional projects and plans, and sociocultural projects (like community maps, ecomuseums, cultural events, etc.).
- Actions for promoting the participation, established by two Regional Departments for improving the participatory processes in the sectors of communication, active citizenry development, touristic valorization, publications and popularization about the PPTR.

In the Italian framework, the PPTR of Puglia constitutes a good model, possibly to reproduce in other Regions¹⁹ (it needs to remark that in Italy some regional contexts do not have a planning system yet aimed at the management and valorization of the landscape, even if the Code requires it). This is possible mostly if the regional administrations are very aware about the importance of equipping themselves of this fundamental tool, so that to invest in its realization. From the other part, the administrators would see a sense of place, a sense of belonging and care coming from the

¹⁹ For example, see the Landscape Plan of the Tuscany Region, in particular for the “map of reports” of the Landscape Observatory, very close to the PPTR Puglia one: <http://www.paesaggiotoscana.it/> [Last consultation: 02-28-2015].

people who live the landscape, just to find the enlightening motivation for starting the process of landscape planning with a participative approach.

2.3.2 Landscape Observatories

In Italy, the main direction regarding the community engagement in the landscape management arrives from the ELC, as it is underlined multiple times in this thesis. Indeed, the Recommendation CM/Rec (2008)3 on the Guidelines for the implementation of the European Landscape Convention, reports that “landscape observatories, centers and institutes” are one of the main instruments for the implementation of landscape policies (II.3.3; Council of Europe 2008). They facilitate the collection and exchange of information and study protocols between states and local communities. Some national and regional bodies have established institutional centers for landscape observation, which show a varied panorama of missions and relationships within the activities of spatial and landscape planning. In Italy, Regional Observatories carry out various activities including the collection of geographical data, accompanying the landscape planning process and drive participation experiments for managing the landscape with the local communities. Today, the Landscape Observatories are a reality quite diffused on the national territory, indeed, by making a research on web and according to the inherent bibliography (e.g. see UNISCAPE 2013), it seems that 17 on 20 Italian Regions are experiencing these strategic tools for the landscape management.

According to the same Council of Europe recommendations, it emerges the need for continuous observation and exchange of information concerning the forces on the landscape, and thus the opportunity of creating specific Observatories as part of a broader system of observation. This implies a range of activities, from descriptions to the exchange of information, to the development of indicators for evaluation, to the development of future scenarios.

In this original framework, the Landscape Observatories could be seen as connection knots between landscape policies pursued by the competent institutions at various decision-making levels and other policies relating to the territories of competence

(agricultural, urban, infrastructural, etc.), by stimulating and nurturing ideas and shared reflections about innovative actions for the landscape. This requirement currently clashes with the difficulties resulting from the extreme diversification of experiences, from the spontaneity and dispersion of initiatives, which also hinder mutual knowledge, but which reflect, at least in part, the inherent meaning of landscape, the irreducible subjectivity of the landscape experience, and the indispensable role of local options in landscape protection (Gambino 2013).

Moreover, the Landscape Observatories can represent a field of action of the relationship between landscape policies implemented by the ELC and those of parks and protected areas, and especially those of “Natura 2000” sites, in which therefore landscape protection intersects with ecological protection. Another role that the Observatories can play in support of policy intervention is as instruments of knowledge, assessment and social communication. Since the establishment of the Observatory of Catalonia (already discussed in the paragraph 2.2.3), there has been an emphasis on the need to configure the Observatories as meeting places, where expert knowledge intersects with ordinary and common knowledge, gathering scientists, technicians, administrators and members of civil society.

In addition, the Observatories can give a helpful contribution in the definition of quality objectives to pursue in each landscape, “taking into account the particular values assigned to them by the interested parties and the population concerned” (Art. 6, ELC). Here, it is crucial to distinguish between “quality” (somehow measurable and rationally comparable) and “value” as the integrated expression of “subjective” appreciation and “common sense” of landscape.

In Italy, the Landscape Observatories can be established according to the art. 133 of the Code of Cultural Heritage and Landscape (n. 42/2004), which mentions the National Landscape Observatory as well as the Observatories in each Region, as instruments suitable for setting up studies, analyses and proposals for the protection and enhancement of the Italian landscape. Regarding the National Observatory, it was established by the Ministry of Cultural Heritage with the Decree of March 15, 2006, integrated with the Decree of Ministry of January 2008 and only in May 2009 the

Observatory was able to begin its activities. It needs to say that, even its several functions and tasks (such as: coordinate the networks of regional Landscape Observatories; propose methodologies for assessing the landscape values; propose the adoption of parameters and landscape quality objectives and proposes recommendations for the policies of restoration, recovery and landscape requalification of goods and degraded areas; propose the methods for identifying landscapes at risk, etc.) the National Observatory for the Quality of Landscape has been inactive and has not produced any useful results (Di Giovanni 2013).

Fortunately, looking at the single Italian Regions the situation is different. After the entry into force of the Code in 2004, some Italian Region Authorities started the process for establishing regional Landscape Observatories (such as Abruzzo, Lombardy and Sardinia) and during the time many other cases have emerged, but in a heterogeneous ensemble in terms of political, administrative and social features. Indeed, it is possible to recognize three general schemes regarding the Italian Landscape Observatories (Calvo 2013).

1. A predominantly top-down model. The administrations coordinate the Observatories, and sometimes include them in the planning process. The individual inhabitants and/or their associations are requested to evaluate the landscape quality of their living environments and to notify the administration of their possible degradation. In this model, which is quite bureaucratic-administrative, and is typical of the central and regional Observatories, the objectives are set by the “expert know how”, and their controlling and intervening activities, as well as their functions, are generally homogeneous in the various fields. The regional Observatories of Sardinia, Veneto, Marche and Puglia belong to this class of model.
2. A predominantly bottom-up model. It includes those Observatories, often local and “spontaneously” established, which are created and managed by individuals and/or associations sensitive to landscape issues. These Observatories often have a successful outcome, as they are created with social or cultural objectives in mind, in order to promote the protection and the enhancement of their own

territory, coping with the shortcomings of the local administrations. These Observatories are based on a participation model, according to which the involvement of the citizens (from the bottom) and in which the “expert know how” interacts with the people’s “diffused know how”. This model has an open structure, its objectives stem from a shared project, and its functions are diversified according to the nature and the problems of each field and design activity. The Piedmont and Canale di Brenta Observatories belong to this model.

3. A network model. It is inspired by the principles of cooperation established by the ELC, and implies the involvement and the cooperation of various entities of any nature (usually institutional), which have a common interest in the landscape. These Observatories are characterized by an open technical-administrative structure, with interaction between the “expert know how” and the people’s “diffused know how”, by working usually at the interregional level, and by objectives stemming from a shared project. The decisional process is horizontal, democratic and participation-based. The activities, usually of a design nature, refer to the indications of the network; objectives and processes are diversified according to the characteristics and the problems of each field. Finally, by sharing all information in the network, it is possible to implement the knowledge of each by means of everyone’s experience. Among the most successful examples of this model include. The Observatory Network of the Piedmont Region (discussed below), the Pays Med Project²⁰, the European Landscape Observatory (mentioned later), and the Experimental Network of the Landscape Observatories of the Veneto Region.

²⁰ Paysmed is a project undertaken between the years 2009 and 2011 with the participation of 14 Mediterranean regions and the presence of the RECEP-ENELC network (European Network of Local and Regional Authorities for the Implementation of the European Landscape Convention). Its project lines of work are: the creation of a virtual observatory of urban and peri-urban Mediterranean landscapes; the establishment of criteria of an operational nature in a guide for managing the landscape in urban areas; the drafting of a catalogue of good practices for the landscape and the awarding of the 2nd Mediterranean Landscape Award; the development of public participation processes associated with pilot actions for managing evolving urban and peri-urban landscapes; the development of a proposal for promoting awareness on landscape, and the development of a themed portal for Mediterranean landscapes, of which this is the web address: <http://www.paysmed.net/> [Last consultation: 02-28-2015].

The heterogeneous nature of the Landscape Observatories shows that these tools, particularly those acting at the local level, are not supported by exhaustive legislation. Moreover, they are not yet officially recognized as being fundamental for the protection, planning and management of the landscape at the national and regional level. Therefore, a structured body of general principles, recommendations and strategic orientation should be established. On this purpose, Calvo (2013) propose a decalogue of guidelines for improving the coordination of the Landscape Observatories:

1. Definition
2. Aims and objectives
3. Level of application
4. Structure
5. Participants
6. Professional figures involved
7. Functions
8. Activities
9. Relationship with territorial, town planning and sectorial planning
10. Code of reference

The Observatory must be seen as an “ideal site” where people and the available instruments meet together to check if the landscape objectives are reached and the policies have been successful or not. The observatory does not have a research or planning role, but it monitors the territories and promotes the citizens’ active participation in all landscape changes. To give an idea of how the Landscape Observatory can address the community engagement for improving the management of the landscape, few examples are reported below.

In Piedmont, there are 8 observatories forming a network²¹ thanks to small associations comprised of engaged groups of people focused on the understanding and protection of their own territories. The network covers 30% of the total Piedmont municipalities, the 27% of the regional surface and involves 40% of Piedmont inhabitants (Zoppi 2013). The people's actions define the programs and the management of the landscape, considered as a historical, natural, social and economic resource also in relation to sustainable development. The network objectives are to create synergies amongst stakeholders, organize together education and learning events and to propose projects for managing the landscape transformations. The numerosity of the Landscape Observatories in Piedmont means that there is a strong sense of awareness and care regarding the landscape as a common good. Indeed, the construction of landscape consciousness is one of the most important aims of this type of observatory, because only with this set-up is possible to have a wide democratic participation in decision making. The Piedmont Network of Landscape Observatories is active tool to study, understand, interpret and compare different situations. It is the starting point for understanding and designing the landscape of tomorrow, which can be built only on an in-depth analysis of the ancient landscape and its transformations (territorial database) related to socio-cultural growth.

One of the most effective tools through which the Piedmont Observatories express their activities is the Atlas of landscapes, which technically are a collection of textual, cartographic, photographic and artistic representations of landscapes resulted from the objective analysis of experts and the subjective interpretations of local people regarding their identity, so to let emerge both the shared and contrasted values. These representations are at different scales (regional, local and even more in detail) and interpret the environmental, historical-settlement, socio-economic and panoramic features, and allow making evaluations concerning transformations and future scenarios of the landscape (Peano et al. 2009). The Atlas are connected to the landscape planning (but they are not institutional or regulatory tools), because they provide to the administrators supportive tools of knowledge for making decisions on the landscape or

²¹ <http://www.osservatoriodelpaesaggio.org> [Last consultation: 02-28-2015].

even they represent the interpretive part the landscape plans. The Atlas of Piedmont landscapes experimented different methodologies for analyzing the social perception of the landscape and comparing the expert knowledge and the ordinary one, by involving local, regional, international and scientific community stakeholders. The tests concerned the evaluation of Piedmont landscapes by using pictures through different channels (face to face and group interviews, World Wide Web, etc.). People had to evaluate places according some themes and categories, such as the quality of landscape, the values, the conservation state, the transformation dynamics, etc. What emerged from this study is that all the stakeholders recognized the representativity of so many different Piedmont landscapes by their aesthetic and functional characteristics (e.g. the most famous peaks on the Alpine arch, the beauty of lakes and hills, the attractiveness of the chief town, the presence of cultural heritage); however, they didn't recognize the flat and rural landscape as identity ones. The worrying aspect is that not even the local people appreciated their rural landscape, neither for the aesthetic pleasure. This suggests that the landscape planning needs to focus harder on strengthening the identity and the social, cultural and economic values that are behind the agricultural landscapes, which play an important role in determining shapes, development, diversification and promotion for people.

With the same basic philosophy, another Landscape Observatory operates instead in Veneto Region, which is that of Delta del Po. Established in 2008, its activities started from the consciousness that local society has got the power to contribute and orient the transformation of the landscape and to start renewing processes of social, economic, cultural and landscape heritage valorization scenarios (Tosi 2009). Delta del Po Landscape Observatory strength points are its varied composition of actors involved (a foundation, the IUAV University of Venice, regional, provincial, and municipal authorities, Regional Park authority and many associations) and its dominant orientation to the educative approach to the landscape issues. Indeed, some of its activities concern “call for ideas” aimed at professors and students of schools who have to tell stories regarding their landscape, indicating the potentialities and the future projects they would like to see in the surroundings, expressing how they imagine the future development of the area.

Another action started by this Landscape Observatory is the Summer School where expert knowledge represented by professionals (architects, planners, professional communicators, etc.) meet the diffuse knowledge represented by students for exchanging ideas and carrying out together projects concerning such a fragile ecosystem that is the delta.

It is important to report another significant initiative at national level, which is still a work in progress: the ambitious “National Observatory of the rural landscape, agricultural practices and traditional knowledge²²”. The Ministry of Politics in Agriculture, Food and Forests established it with the Decree n. 17070 on November 19, 2012. The National Observatory of the rural landscape tasks are the census of those landscapes, agricultural practices and the inherent cultural knowledge retained with such a value, the promotion of research activities to deepen the values connected with the rural landscape, its protection, management and planning, also to conserve the bio-cultural diversity. Another task is to carry out the general principles and guidelines for the protection and valorization of the rural landscape, with a specific reference at the interventions included in the Community Agricultural Policy. An important aspect of this Landscape Observatory of the rural landscape is its vocation to preserve and valorize the traditional knowledge of those complex systems based on ingenious and diversified techniques, on local tasks expressed by the rural civilization, which provided a huge contribution for building and maintaining those traditional landscapes associated to them.

To develop this ambitious Landscape Observatory it needs a vast taskforce distributed in a network throughout the Country and a clear set of indicators through which conduct the investigations, like significance, unicity, persistency, integrity, vulnerability of the rural landscape characters (those ones recall the VASA methodology explained in the chapter 1.2.2 of this thesis). For other indicators like the socio-economic activities, the cultural values, the transformations, it will be fundamental the involvement

²² <http://landscapeunifi.it/it/osservatorio-nazionale-del-paesaggio-rurale> [Last consultation: 02-28-2015].

of local people and their knowledge to reconstruct the history of the rural landscapes. Once again, the community engagement turns out extremely useful and important for the actions propaedeutic to the rural landscape management.

Finally, with the Decree 17070/2012 the Register of “rural landscape of historical interest, of agricultural practices and traditional knowledge” is established by defining both objective indicators, such as significance, integrity, vulnerability mentioned above, and the values expressed by local communities and the stakeholders involved.

At European scale, a case needs to be mentioned, more as a network of Mediterranean countries that share the landscape issues in the light of ELC application and less as a community-based model. It is the European Landscape Observatory²³ activated in 2008 by Arco Latino²⁴, a network of national and international administrations and organizations²⁵ of four countries: Italy, France, Spain and Portugal. In coherence with the ELC directives, the European Landscape Observatory has the mission to protect, defend, valorize and manage in a sustainable way the landscape. Its objectives are the promotion of sensitivity to the civil society, private organizations and public authorities about the landscape values, its roles and transformations; the promotion of education of the landscape issues; the improvement of tools for the assessment of the landscapes and the definition of quality objectives; the implementation of specific tools aimed at the protection, management and planning of landscapes. Amongst the European Landscape Observatory activities, remarkable is the European Master of the Landscape, organized to train professionals able to deal with the conservation, management and planning of the landscape at international level.

²³ <http://www.osservatoriopaesaggio.eu> [Last consultation: 02-28-2015].

²⁴ <http://www.arcolatino.org> [Last consultation: 02-28-2015].

²⁵ Even if this paragraph contains case studys at Italian scale, this experience is reported here because refers, first, to landscape observatory theme, and, secondly, because the headquarters of the European Landscape Observatory is located in Italy.

In conclusion, the landscape observatories, in all of their expressions, do not have to be considered only study centers for documentation and monitoring, rather they are subject able to support the management of the transformation processes regarding the landscape. It is seen that maps, atlas and catalogues can be considered real useful tool for orienting the integration of the landscape issues in the government instruments for the territory, being clear, from time to time, which are the most important objectives of the landscape quality to be achieved. Furthermore, the landscape observatories are places of convergence and exchange amongst different knowledge, in which the local society needs to be strongly involved because it is able to introduce imaginaries, evaluation criteria and future perspectives.

2.4 A glance to overseas: the community engagement in the rural landscape of Vermont

Contents:

- A different perspective of the landscape management by involving local communities is given, starting by looking at some US main concepts related to the thesis topic: landscape as a working land, land use planning, community engagement as a social priority, the sense of place
- Other related concepts and characteristics are given, specifically by focusing on the State of Vermont: the rural landscape as a strong resource for everybody, the highly “green” tendency of the Vermont, the sense of care for the landscape by its community
- Three case studies developed in Vermont are described for dealing with the different levels and methodologies of the community engagement in the management of landscape: PLACE Program, ECOS Project and the Council on the Future of Vermont

This paragraph finds its origin, first, in some researches through the World Wide Web about international projects and experiences that combine the involvement of local people into the landscape management actions, taking into account particularly those processes that include an evident link between the place and people’s perceptions and sense of belonging to it. Secondly, these web researches turned into an abroad

experience at the University of Vermont, in USA, through which it was possible to get links with a different reality respect to the Italian and, in general, the European ones, and take inspirations for the objectives of this thesis.

To understand the diversity of contexts, it is useful elucidate some key topics inherently the visions and approaches in USA, and then in Vermont, to the specific issues of this chapter: the landscape concept and the landscape planning, the role of local community, some aspects for reading the rural landscape in Vermont.

2.4.1 Some key topics from USA and Vermont

First, the American concept of landscape is quite different respect to the European one. To better understand that, it is useful to give some definitions accepted overseas. The U.S. National Park Service considers the landscape a geographic area, including both cultural and natural resources and the wildlife or domestic animals therein, associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values (National Park Service 1998). According to the Sustainable Sites Initiative²⁶, the landscape is the visible features of an area of land, including physical elements such as landforms, living elements of flora and fauna, abstract elements such as lighting and weather conditions, and human elements such as human activity or the built environment. Moreover, Steiner (2008) states that landscape is related to land use; the composite feature of one part of the surface of the earth that distinguish it from another one is a landscape. It is, then, a combination of elements. The landscape encompasses the uses of land – housing, transportation, agriculture, recreation, and natural areas, and is a composite of those uses. A landscape is more than a picturesque view, it is the sum of the parts that can be seen, the layers and intersections of time and culture that compromise a place – a natural and cultural palimpsest.

In addition, in USA it is frequent speaking about “natural landscape” and “cultural landscape” on the base of most prevalent elements present (just the natural or the

²⁶ <http://www.sustainablesites.org/> [Last consultation: 02-28-2015].

cultural ones), mostly because the recognition of cultural landscapes is relatively recent in the United States, instead the natural landscape has been widely understood in relation with the terms “natural resource” and “ecology” since 1970s, and it is usually defined as areas that have not been actively managed or developed (Slaiby and Mitchell 2003). This distinction is comprehensible if it thinks that the vast American territories have been conquered in a time very more recent than the European ones. At the time of the US founding fathers, those lands appeared to them so boundless, with endless expanse of woodlands, rich farmlands, rolling pastures graced by fresh, clear creek and rivers, abundant game and pristine coastline and with a low people density, that the domain of nature influenced also the successive vision of landscape. While in Europe there was a “hungry of lands” that brought, amongst many consequences, the development of strict rules for land uses, in USA an intensive exploitation of natural resources did not determine the establishment of new rules, rather the shifting of the conquest of lands by moving even more from East to the West when the resources were over.

While there are some points in common in the American and European landscape definitions (the visual perspective, the combination of natural and cultural elements, the expression of human values), the vision of the landscape is different, of course just because the human history of the two continents has been diverse, as it is briefly alluded.

During the decades of the second half of the Twentieth century, an increasing diffused awareness for the management of the landscape grew up and one of the most valuable effort recognized for developing a systematic methodology in terms of planning the land use was made by Ian McHarg (Steiner 2008). He carried out the ecological planning model by including the use of biophysical and sociocultural information to suggest opportunities and constraints for decision making about the use of the landscape in the best way. According to this model, there are different steps to reach and one of these is the landscape plan, which is meant as a tool that should incorporate natural and social consideration of a wider planning process. A landscape plan is more than a land use plan because it addresses the overlap and integration of the land uses and involves the adoption of policy goals (which are comprised in another step of the entire process). The landscape plan should include written statements about policies and implementation

strategies, as well as map showing the spatial organization of the landscape. Its objectives are giving a strategy for development and local scale, providing flexible guidelines for policy makers, land managers and land users on how to conserve, rehabilitate or develop an area.

For analyzing in a systematic way the landscape, McHarg (1981) elaborated a “layer-cake model” (see Figure 2), which consists of studying and understanding the biophysical elements and the chorography of the place in terms of superimposable categories that include bedrock geology, surficial geology, groundwater hydrology, physiography, surface-water hydrology, soils, plants, wildlife, micro-, meso- and macro-climate and people. The layer cake has evolved over time and continues to do so, therefore it is an expression of historical causality. It is possible to peer from the surface to the bottom and explain process, reality and form.

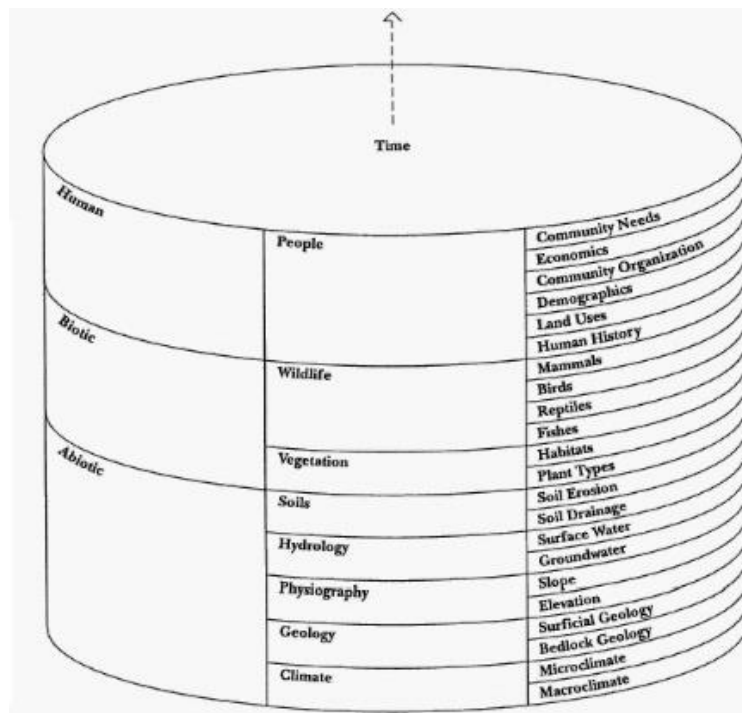


Figure 2 – Ian McHarg’s “layer-cake model” (Source: McHarg, 1969).

According to McHarg’s “layer-cake model”, it is possible to “read” the landscape by having a fully understanding of the patterns that have shaped it. Wessels (1997) applied this approach in the New England landscape like an investigator, making notice that

through some knowledge of history and a broader view of a forest and not just its trees, it is possible to see the forces that shape a place. This new way of seeing creates reverence, respect, a sense of inclusion and accountability. Reading the landscape is not just about identifying landscape patterns; more importantly it is an interactive narrative that involves humans and nature or those interested in enhancing their sense of place.

Right about the sense of place, it is another important topic emerging by studying the landscape issues in USA, where it has been explored until to mature a rich tradition in the literary world (Harris 2006). The sense of place is a feeling that everybody can feel, which is both an individual or shared one, and it attributes a meaning of uniqueness, identity and belonging to a certain “portion of space”. It does not matter how much big is that space, but it counts the set of values that are encased in it and which ties a person, or an entire community, to a certain place, that it can be defined own (Tavone 2013). It is true that this is a concept traceable especially in the United States, where it is considered an important value to respect in all the types of the participatory process, regardless the level of formality requested; indeed, the case studies that are following in this paragraph take into consideration the sense of place in their development. However, “*a sense of place*” have to be considered a universal concept. In fact, a place has always been identified by a name, for example, to distinguish it from its undefined surrounding space. Nevertheless, there are some places which encase a stronger meaning than others, and it is expressed by its name or by the knowledge regarding it preserved by the community that lives there. Therefore, the sense of place is a social phenomenon, because it indispensably requires the human involvement, and it generates from a sort of stratification of individuals’ perceptions and experiences. The feeling of strong belonging is often inspired by the natural environment, and, in the most of cases, the landscape, that is the space where culture and nature are strongly connected each other, gets the right features through which people who live in it can retrace their own identity. As Wendell Berry writes, “*You can’t know who you are until you know where you are*”, so the exploration of the sense of place is also a discovery of a sense of themselves. Exploring the sense of a place means to understand what is important, what can acquire meaning and value for the community that lives it, and so, in other words, it means to find an access way, made by tales and people, to know the social history of that place and to

interpret the future willing of its people. From this perspective, the sense of place is a key stone to take into account in the participatory processes aimed at landscape planning. In a decisional perspective, it should be needed to find the right way to let emerge these collective values, to make them explicit and concrete so that the future actions of the landscape plan (or the land use planning) can support them, and, mostly, reinforce them.

In this direction, another strong point to underline is how much important the community engagement is in the US in the decision-making process aimed at the landscape management. Indeed, involving people in decision about the future is one way to help community to address change. Participation is the process by which public concerns, needs and values are incorporated into governmental decision making (Creighton 1992) and wherein citizens and government officials jointly plan or implement public policies (Sarkissian et al. 1994). Moreover, James Creighton (1992) identifies eight benefits of public participation: (1) improved the quality of decisions, (2) the minimization of costs, (3) consensus building, (4) increased ease of implementation, (5) the avoidance of worst-case confrontations, (6) the maintenance of credibility and legitimacy, (7) the anticipation of public concerns and attitudes, (8) the development of public expertise and creativity. Even though there are many benefits, citizens will not participate in a planning process unless there are tangible issues and they consider these issues significant and they feel their participation a reasonable chance of making a difference (Institute for Participation Management and Planning 1997).

The participative process aimed at the landscape planning, or better, the land use planning as it correctly refers in USA to the entire process, is also considered an occasion where implementing lifelong education, through which achieve awareness, balanced perception, learning and decision making. To accomplish these goals, individuals must develop a functional understanding of their cultural inheritance as well as the ability to contribute in a positive manner to society. Education occurs through the traditional institutions identified for that purpose, through continuing involvement in a discipline, through community programs, and, in the broadest sense, through popular culture. Community education increases both citizens' and planners' knowledge and place. As a result, community education must be both future-oriented and ongoing. Continuing

education should assist people in making linkages between their individual skills and interests and larger public issues. Without such linkages, the rules and regulations developed to protect people's health, safety and welfare will be treated with suspicion by those whom they were meant to protect. Although community education and citizen involvement should be considered central and integral to each step in the planning process since its beginning, they need to be carried on after a landscape plan has been developed, because a continued explanation about the plan is often necessary before it is implemented (Steiner 2008).

As the land use planning and management is an issue which pertains many stakeholders and groups of interests, another approach that is diffusing throughout the US in several sectors is the so-called "collective impact" approach (Kania and Kramer 2011). Collective Impact initiatives are long-term commitments by a group of important actors from different sectors to a common agenda for solving a specific social problem. Their actions are supported by a shared measurement system, mutually reinforcing activities, and ongoing communication, and are staffed by an independent backbone organization. Successful examples of collective impact are addressing social issues that, like education, require many different players to change their behavior in order to solve a complex problem. Shifting from isolated impact to collective impact is not merely a matter of encouraging more collaboration or public private partnerships. It requires a systemic approach to social impact that focuses on the relationships between organizations and the progress toward shared objectives. Even the landscape management issues can be invested by this approach, which is having a widespread resonance throughout the US (Hanleybrown et al. 2012).

Consistently with these key topics concerning the community engagement in the land use planning in the US, the focus of the research now is going to concentrate specifically on the State of Vermont for many reasons that well match the objectives of this thesis.

Vermont presents itself to its visitors many characteristics that other rural places have lost: a wealth of wildlife and scenic beauty, traditional working landscapes that

support viable local economies, and desirable social and cultural attributes — low crime, helpful neighbors, and close-knit villages and towns. Moreover, its natural resources include forests, clean waters, vibrant fisheries, healthy wildlife populations, rare species, significant natural communities, and a working landscape, provide people with the opportunity to, among other things, hike, hunt, fish, trap, birdwatch, and work the land (Austin et al. 2013).

Vermont has much more forest today than it had in the mid-1800s, and the effect of this change on wildlife has been dramatic. Today, its landscape is 78% forested. Vermont's agricultural activity also affected the soils and the plants that grow in them. During the clearing of the land in the 1800s, much natural topsoil was moved by erosion from the hillsides down to the low river valleys. As Vermont's landscape recovers from past land uses, another major force that is transforming it again is commercial and residential development.

Today agriculture and forestry still support Vermont's economy in significant ways, but many areas of the state are now moving toward a service, commercial, and light industrial economy. During the past two decades, Vermont's population has grown by 10%, and as of 2013 the population was approximately 626,630 (U.S. Census Bureau 2014). Vermont has seen a 40% reduction in the number of farms since 1960 (USDA Census of Agriculture²⁷) and between 1982 and 1992 the State lost 6,500 acres of open space each year to development, as reported in the report by the U.S. Environmental Protection Agency (1999). These development patterns reduce the average parcel size and alter the way people view their relationship to the land, creating of course also threat to a sustainable economy based on working landscapes.

Just the concept of working landscape is a key element of this State life; it is very important and conditioning the decision-making processes to manage the rural landscape. Indeed, Vermonters are constantly motivated to implement practices on the land (which are highly sustainable in terms of environment and economy, because in the State a high environmental consciousness has been achieved by people throughout state

²⁷ <http://www.agcensus.usda.gov/> [Last consultation: 02-28-2015].

in general and by the local communities too) for getting multiple benefits (economic, social, recreational, touristic, cultural benefits). This tendency rooted some decades ago, when Vermont passed the Act 250, Vermont's Land Use and Development Act, so from 1970 Vermont legislation started to mitigate the effects of development through an application process that addresses the environmental and community impacts of projects that exceed a threshold in size (McGrory Klyza and Trombulak 1999). That was just the beginning, because during the time, a number of policies to promote efficiency, alternative energy and reduce pollution contributed to make Vermont the “greenest State” of USA²⁸ (and the merit is not because it is the second smallest population State).

Still in direction of the working landscape concept, a recent law, the Act 142, passed on May 15 2012, created the Working Lands Enterprise Board, made up of individual Vermonters who are active in the farm, forest product, and value-added sectors, which oversees a fund of nearly \$1 million²⁹. It is a marriage of tradition and modernity in that it supports private enterprise and light-handed government as it embraces contemporary concepts such as stakeholder identification, collaboration, coalition-building, and strategic intervention. The Act puts Vermonters in position to maintain their cultural heritage by acknowledging that people have a place on the land. It promotes the concept that individuals and businesses that support the wise stewardship of the land are welcome there, especially if they utilize the land and natural resource base in ways that meaningfully contribute to Vermont economy. This legislation allowed to reinforce the link that people have with their rural landscape, their working landscape, and in some way it is another piece that confirms what it says about Vermont’s rural beauty, it’s tradition of face-to-face democracy, its ethos of live-and-let-live self-reliance (Courtney and Zencey 2012).

Another aspect that rewards Vermont rural landscape is the diffusion of the multifunctionality practices, which is not so foregone in US. Indeed, in terms of agricultural policies on sustaining this practice in the landscape, in Europe

²⁸ <http://www.dailyfinance.com/2011/04/22/top-earth-day-10-most-and-least-green-u-s-states/> [Last consultation: 02-28-2015].

²⁹ <http://vtrural.org/programs/working-lands/about/wlei> [Last consultation: 02-28-2015].

multifunctionality of agroecosystems is supported by public funds through agri-environmental schemes (Wade et al., 2008), which seek to align biodiversity conservation with other public benefits such as water quality, carbon sequestration, and rural tourism, by paying farmers for the public benefits they provide (Sutherland 2004). While multifunctionality has been explored and supported in Europe and Asia, the US has been slow to adopt policies that support functions beyond commodity production for agricultural landscapes (Groenfeldt, 2006). According to Lovell et al. (2010), landscape multifunctionality is an appropriate approach for designing farms in Vermont for many reasons: the first is its focus on larger spatial scales such as the whole-farm or an entire rural region. A second benefit of integrating landscape multifunctionality is inherent focus on cultural functions provided by agricultural landscapes. By incorporating cultural functions such as visual quality, recreation, and historic preservation, multifunctional landscapes can contribute to preservation of landscape history and public enjoyment of the rural environment. A third advantage of landscape multifunctionality is an embedded framework for evaluating the success of the landscape design. Unlike the more ambiguous term “sustainability”, the concept of multifunctionality suggest an opportunity to develop specific goals or targets for ecological, production and cultural functions to improve landscape performance. These advantages are realizable in Vermont considering its unique qualities. Indeed, many Vermont farms incorporate ecological principles and a social mission along with agricultural production. Not only is Vermont a leader in organic agriculture, with the seventh highest number of certified organic operations in the country (USDA Economic Research Service, 2008), but the state also has a strong movement for local agriculture (Center for Sustainable Agriculture UVM, 2009). Moreover, there are more than 65 Community Supported Agriculture (CSA) programs in Vermont (NOFA Vermont, 2007), enabling consumers to buy food directly from farmers. The number of farmers’ markets in Vermont has more than tripled in the past two decades. In addition, in terms of cultural and educational benefits, for example, the Intervale (a highly agricultural devoted area of the Winoosky floodplain, close to the city of Burlington) supports multiple cultural functions including historic preservation, recreation, education, and visual quality. Education is specifically supported by a number of programs including Healthy City, a non-profit farm that teaches at-risk youth how to

grow and market food, providing teenagers with a positive way to interact with the community and gain skills for future work (Lovell et al. 2010).

In terms of management and planning, one of the greatest debates in both agroecology and landscape multifunctionality is on the emphasis on top-down (policy-driven) versus bottom-up (grass roots) initiatives. Multifunctionality of agriculture has been used primarily to support agricultural policy (Wade et al., 2008), while agroecology began as a bottom-up approach guided by the specific needs of farmers (Méndez, 2010).

Just about agroecology, the Gund Institute of Ecological Economics at University of Vermont applies specifically in this discipline the already mentioned transdisciplinary approach PAR (see paragraph 2.1.2), because it allows to analyze interactions between agriculture, livelihoods, and environmental conservation by involving the stakeholders as active participants in an integrated process of research and action. This approach turns very helpful when the expectation of the research process and/or its results are strongly connected, and often depended on, the stakeholders' attitudes.

This general overview of different but interrelated topics are given mostly to let understand the context in which the next case studies are exposed, and to have clues of why this research has taken a part abroad just in Vermont in terms of inspirational experiences aimed at improving the knowledge of the present study.

2.4.2 The PLACE Program

PLACE (Place-based Landscape Analysis and Community Engagement) Program³⁰ is a community outreach initiative, offered collaboratively by the University of Vermont and Shelburne Farms, a no-profit organization which aim is educate for a sustainable future. PLACE is an attempt to apply landscape analysis and whole systems thinking to fostering a sense of place and a sustainable future in local communities. The essential work of PLACE is to bring expertise and energy from the two founding partners and other partnering

³⁰ <http://www.uvm.edu/place/> [Last consultation: 02-28-2015].

organizations to bear on developing integrative and interpretive analyses of town landscapes.

The centerpiece of PLACE is the local landscape itself, the dynamic stage on which the drama of life has been enacted through time. Each year, program staffs from the partnering organizations work collaboratively with one Vermont town with the goal of engaging community members in the unfolding story of their place. PLACE is about exploring the relationships that exist in the landscape-community system, deepening these relationships where possible, and reintegrating people and the land in meaningful ways. It offers opportunities for enriching one's sense of place and fulfilling aspirations for stewardship.

The mission of the PLACE Program is to promote a sustainable relationship between communities and their local landscapes by engaging residents in exploring, understanding, honoring, and celebrating the natural and cultural features that contribute to their town's character.

PLACE staff and service-learning students attempt to accomplish this mission by working directly with local schools, town commissions, historical societies, and conservation organizations to develop an integrated series of presentations, field trips, workshops, community forums, and web-based materials designed to facilitate residents' understanding of the natural and cultural history of the local landscape.

Therefore, the program vocation starts to the educative status that lies behind people's behavior and perception of their own landscape, to explore with them the training needs and to project in a shared way the activities to achieve these needs.

The activities of the PLACE Program are rooted in the reality that landscapes and their associated communities are complex systems (Dramstad et al. 1996), and that involving a diversity of individuals and organizations is essential for the program to achieve its mission. According to this vision, some goals of the PLACE Program remark this emphasis on whole systems and diversity (Poleman 2010):

- Encourage exploration and understanding of the local landscape by providing an engaging and accessible framework for residents to learn more about their town's natural and cultural heritage.
- Showcase local knowledge and the efforts of individuals and organizations involved in local landscape stewardship and interpretation.
- Facilitate the integration of place-based learning into schools by providing local educators with information, resources, and curriculum development support.
- Support an informed and participatory community visioning process that builds upon an integrated interpretation of town landscapes and their transformation through time.
- Provide meaningful service-learning opportunities for graduate students involved in landscape analysis.
- Strengthen the sense of community identity and the connection between the past, present, and a sustainable future.

It is important to report the reflections at the base of the PLACE Program, because they can be seen also in other country contexts, with the necessary corrections of the case. Indeed, what is exportable of the program is not only the methodology but also the research needs that lie behind it.

These reflections start from the awareness that we live in a fragile world, even if it does not seem so (Miller et al. 2008), where financial breakdowns in one sector ripple throughout the entire economic system, or information from one place reproduce with viral speed through the network of computers around the earth, the local and the global have become intertwined in our daily lives as never before. As consequence, for people it is easy to lose the stability and the reference points granted at local level, so rather being rooted in local communities, increasing number of people have become displaced, defined more by career than community, and lack the psychological investment and sense of responsibility and belonging that come from being settled in a particular place (Giuliani and Feldman 1993; Tall 1993).

This pattern of uprooting leads to the phenomenon of *placelessness*, which means a lack of a sense of place, expressed by those landscapes that have not a special relationship with the place in which they are located and, for this reason, could be located somewhere else; *placelessness* manifests itself in alienation from other phenomena and a lack of engagement in the cultural and political affairs of a community (Gruenewald and Smith, 2008). This phenomenon is serious because it determines the decline in social capital and active participation that undermine the ability of society to have an effectively functioning democracy (Putnam 2001).

These issues can be joint with others belonging to the Vermonters'. For example, according to a survey conducted in 2008, people are worried about the uncertain future, especially connected to the themes of affordability and food; moreover, 69% of the respondents were concerned about the health and viability of Vermont farms and the agricultural sector (Moser et al. 2008). Vermonters are also concerned about the shift in demographics, with a growing elderly population and many high school graduates choosing to leave the state: Vermont has lost 19% of its 20-to 34-year-olds since 1990, with many young people moving out of state for higher education—and not returning (Bolduc and Kessel 2008). Moreover, while Vermonters have many concerns about the future, they are very clear about one of the central things they value: their connection to place. As the Vermont Council on Rural Development evidenced in the results of a project about which it reports later (see paragraph 2.4.4), the environment that Vermonters' are famed for valuing extends beyond natural systems; it centers on the working landscapes of farms and forests, and includes the built environment, which largely reflects historic development patterns of cities and villages surrounded by agricultural and forest lands. In addition to this strong connection to the land, Vermonters espouse several other related values: a strong sense of community where the engagement of every individual is important; the stewardship of natural resources and preservation of the state's rural character; life at a smaller, more manageable scale; the tradition of hard work and spirit of independence; and an "education system that prepares students for success in the 21st century" (VCRD, 2009).

Another aspect that is strongly perceived by Vermonters is the place-based education as a rich educative approach. Indeed, teachers and students are encouraged to actively explore the geography of their home places, helping them to understand the patterns and processes that are integral to the health of the natural and cultural systems. This approach is being promoted in schools throughout Vermont (Poleman 2010). The place-based education is more than just a new approach to environmental education or the latest alternative teaching methodology, but part of a broader social movement that is seeking to reclaim the importance of the local in the global age (Gruenewald and Smith 2008). Sometimes referred to as “the new localism,” this movement has emerged in response to the economic changes that weaken the fabric of community life. This return to local (without denying the benefits that sometime globalization brings) is not a rejection of the tenets of the free market, but rather a “place-conscious” approach for creating and supporting opportunities for community members now and in the future (Shuman, 1998). Vermont is at the forefront of the new localism movement and Vermonters are building upon their existing affinity for place in creative and productive ways. In order to combat issues from unemployment to climate change, many people see relocalization as an essential ingredient in the recipe for a sustainable future.

This Vermonters’ general attitude demonstrates a high level of consciousness regarding the importance of the sense of place (as it is already said in the previous paragraph), by reporting it in everyday life.

Under the light of these knowledges, it reveals more evident the connection between the PLACE Program approach and its purposes and principles, such as the landscape analysis, the community based research, the place-based education. While the last one is already emerged, it is remarkable underlining the first two ones.

Landscape Analysis is an approach to investigating and interpreting landscape-level systems that emerged at the University of Vermont’s Field Naturalist Graduate Program. It stresses an integrated, field science approach that weaves together knowledge and field methods from a range of traditional disciplines, including botany, geology, soil science, wildlife biology, archaeology, and historic preservation (Poleman 2010). Landscape analysis is also closely aligned with the discipline of landscape ecology, a

subset of ecology that deals with the spatial variation in the landscape and its impact on ecological processes.

In order to make sense of these complex systems, the PLACE Program utilizes a suite of conceptual frameworks to help participants analyze and interpret their town landscapes. Central to the approach is initially dividing the analysis into three main focal areas: the physical landscape, the cultural landscape, and the ecological landscape. The advantage of utilizing this framework is that it allows participants to efficiently organize their research, while drawing attention to the ways in which the stories and processes inherent in each focal area are closely intertwined with those of the others. After analyzing the different pieces, it needs to come back and reintegrate them to the whole system, because the landscape requires always an overall vision to be really understood.

Moreover, the landscape analysis framework allows working with its patterns and processes; this investigative approach stresses not only inventorying the biotic and physical components (pieces), but also examining how these pieces are distributed in the landscape (patterns) and what forces drive these patterns (processes). In addition to the spatial arrangement of pieces on the landscape, it also underscores how these patterns change through time, whether it be seasonal (phenological), human induced (i.e., land-use history), or long-term shifts in the physical/atmospheric environment (Poleman 2010).

In this work of landscape analysis, the layer cake approach (developed by McHarg and already seen the previous paragraph 2.4.1) is a key framework useful in highlighting the importance of what is happening below the visible surface of the landscape. Although it is an oversimplification, it promotes the idea that the distributions of natural and human communities (and land-uses) are often intimately linked to what lies beneath (Wessels, 1997). It also parallels the timeline approach, since the oldest components of the landscape (the rocks) are at the foundation of the layer cake. Even this approach is currently used by the Field Naturalist Program at the University of Vermont. The PLACE Program uses the layer-cake approach both as a framework for landscape inventory and as a teaching tool for organizing interpretive presentations.

It is relevant to notice, then, that under the participative point of view the PLACE Program applies an approach comparable to the PAR already cited (see the previous paragraph 2.4.1), which is the Community Based Participatory Research. It is a collaborative approach to research where traditionally trained scholars and members of a community work in equal partnership on projects aimed at community-identified needs (Strand, 2000).

Poleman's specific research (2010) found that although PLACE Program has been achieving its primary objectives since its inception in 2001, there is always the opportunity to redesign the Program, mostly to make it more participatory and relevant to the needs of the community and the lives of the residents. On this purpose, one significant change lies in the meaning of the acronym that turned from Place Based Landscape Community Education in Place Based Community Engagement. Moreover, the other points on which PLACE implementation is going to concentrate in the recent years is the web-based mapping as a fundamental tool for returning the results of the landscape analysis³¹, the involvement of traditional skills and knowledge to transfer to new generations, the use of ecological phenology and architecture to inspire sustainable design projects or dissemination events where people can learn and share knowledge starting from the discovering of their surroundings. Another interesting step is the exportable character of the PLACE Program in different cultures and in different countries, to explore the possibility of cultivating community-based research and education programs focused on the connections between people and their own land.

The big jump of the PLACE Program in the future might be done by driving its methodology towards not only the educational sphere of application, but also the planning one in terms of place based landscape management.

³¹ One of the most recent declination of the PLACE Program in this sense concerns the surrounding landscape of Burlington, with the ongoing Proagrma "Burlington Geographic": <http://www.uvm.edu/place/burlingtongeographic> [Last consultation: 02-28-2015].

2.4.3 The ECOS Project

Still staying in the field of landscape planning, the second relevant case study from Vermont, under the point of view of the community engagement, is the ECOS Project³², which acronym means Environment, Community, Opportunity, Sustainability. It is both a process and a plan for managing sustainable growth in Chittenden County, the most populous county in Vermont. It combines the Regional Plan, the Metropolitan Transportation Plan (MTP), and the Comprehensive Economic Development Strategy (CEDS) into one integrated plan, adopted on June 2013.

The ECOS Project is considered a unique opportunity for municipalities, organizations, businesses and residents to work together to preserve and improve the quality of life. 19 municipalities and 42 organizations participated to its drawing up (Chittenden County 2013).

The main steps behind the ECOS Project are:

1. Define the *Broad Goals* that the Plan should care about, that are:
 - Natural Systems – Design and maintain a strategically planned and managed green infrastructure network composed of natural lands, working landscapes, and open spaces that conserve ecosystem values and functions, and provide associated benefits to our community.
 - Social Community – Promote the skills, resources, and assurances needed for all community members to participate in the workforce and in their family, civic and cultural lives, within and among their neighborhoods, and in the larger community.
 - Economic Infrastructure – Build the region’s capacity for shared and sustainable improvements in the economic wellbeing of the community through support of both local and global competitive initiatives.

³² <http://ecosproject.com/> [Last consultation: 02-28-2015].

- Built Environment - Make public and private investments in the built environment to minimize environmental impact, maximize financial efficiency, optimize social equity and benefits, and improve public health.
2. *Analysis*, a phase for producing data and analysis in order to improve the common understanding in the community with regards to economic development, housing, energy, land use and transportation, natural resources, public health, and education.
 3. *Indicators* elaborated to gauge the progress of the region towards reaching its sustainable development goals into the future.
 4. *Plan Priorities*: public engagement activities managed by Burlington City Arts were conducted to gather more community input on concerns and strategies for addressing those concerns.
 5. Plan Implementation.
 6. *ECOS Plan Adoption* (occurred June 19, 2013).

The community engagement is the foundation of the ECOS Plan, indeed it is implemented in almost all the phases of the process through different methodologies, such as: individual meetings, personal interviews, focus groups for creating future scenarios, online surveys, a dedicated web site to get direct feedback on the strategies and the actions. Meaningful community engagement is not a one-time interview or survey; it is the development of an ongoing relationship with a continuous loop for input and feedback on decisions and outcomes, and this was taken into account during the process. Moreover, the participatory stage was directed by an organization that took care about all the steps, which is an important requisite for the effectiveness of the process, as suggested in the “collective impact” approach mentioned above (see Kania and Kramer 2011).

One of the project primacies was to learn about residents’ priorities to lead then the planning process in the best direction: to do outreach and community engagement, community members were involved in different creative endeavors as a means to reflect

on what was important to them: what they like about living there, and what they would like to see change. Rather than conducting a survey, this creative, qualitative approach was meant to explore peoples' ideas and feelings about the institutions they interact with and their surroundings. All this was possible because of the belief that all community members have the skills, resources, and assurances needed to participate in the workforce and in family, civic, and cultural life within and among neighborhoods and in the larger community.

From the ECOS Plan come a recommendation concerning the landscape management: today, protecting Vermont's working landscape is becoming even more important due to renewed interest in rural and urban agriculture, including community supported agriculture, and the continued use of forest products for fuel, maple sugaring, and construction material.

2.4.4 Council on the Future of Vermont

The last case study is an interesting project, this time at State-scale, called "Council on the Future of Vermont"³³, a statewide public dialogue and a critical look at the past and present of the state carried out in two years (2007-2009). The Vermont Council on Rural Development (VCRD) led the project starting by the idea that Vermonters and Vermont communities develop their capacity to create a prosperous and sustainable future through coordination, collaboration, and the effective use of public and private resources. In September 2007, the VCRD activated the Council on the Future of Vermont in the belief that in this time of rapid change there is need to take time together to examine the big picture trends, evaluate the opportunities and challenges ahead, and consider common Vermont priorities.

For this project, Vermonters were invited to participate in many ways: through public forums, in small group settings, at schools, churches and businesses, as well as online and over the telephone. The Council invited presenters to share their thoughts and

³³ <http://futureofvermont.org/> [Last consultation: 02-28-2015].

ideas for the future of the state at its monthly meetings. In total, over 3,900 Vermonters contributed their ideas to this process (VCRD 2009). For the project fourteen public forums were held, one in each county of the state. In addition, more than ninety focus groups meetings were convened with a wide range of Vermonters, such as high school and college students, farmers, teachers, nurses, factory workers, low-income Vermonters, veterans, seniors, foresters, granite workers, and advocacy groups. Staff people of the project visited with inmates at a prison facility and refugees who spoke no English. They met with long-time Vermont families and new citizens.

All of these people spoke about what Vermont meant to them, what common values Vermonters shared, what challenges and opportunities they saw as most important, and what their priorities were for Vermont's future.

The Council on the Future of Vermont, then, carried out with the invitation of over three hundred statewide organizations to contribute their concerns and ideas to the process. Also statistically significant polling and a comprehensive trend line research project that identified major changes in Vermont in the past few decades were convened. Amongst the results, it is relevant that 71% of the Vermonters involved thinks that the "working landscape" is a key stone for their future (coherently to one of the direction prospected by the ESCOS Plan seen above). In addition, the importance of the sense of place is mentioned as a fundamental principle of their lives, as it has been already remarked by exploring the main topics that link the multiple facets of Vermont landscape.

This project started by the idea of a State organization (the VCRD) by which it was implemented through an intense bottom up approach for taking the needs, visions, values directly from people. And then, from people, the "baton" came back to the leading organization with the important task to transform all people's voices into priorities and recommendations to deliver at the decision-making level. In fact, this was the job made by the VCRD at State level, once this project was completed.

2.5 A synthesis: the worthiness of the community engagement beyond the heterogeneity of the cases

Contents:

- A synthetic view of all the case studies present in this second chapter are reported, highlighting the typologies of stakeholders, the reasons of their involvement and the prevalent participative modalities applied
- In a vast heterogeneity of cases, some points in common are commented

This last paragraph of the chapter two aims to give a synthesis of the case studies previously analyzed, but without any pretense of exposing an exhaustive scenario of the typologies and modalities of community engagement finalized at the landscape management and planning.

The Table 3 summarizes the main characteristics of the fifteen case studies in terms of typologies of stakeholders involved, motivations at the base of their involvement and the prevalent participative modalities applied. At a first glance, it appears a general high heterogeneity of features in all these three classes, because it relates with different countries considered, and projects and programs that have diverse basic philosophies. Actually, the purpose was just pull over a variety of situations to understand if they have some points in common.

Indeed, there are. In terms of stakeholders involved, the general citizens or their representatives in associations of categories are always present because, of course, they are the first beneficiaries of the decisions regarding the landscape. A diffused recurrence is noticed also for the experts and the administrators, at different scales of action, which evidences the link that needs to exist amongst the diverse figures implied in the management of the landscape. Thus, the presence of these stakeholders is clearly necessary, so the citizens and the administrators belong to a group that might be called the "mandatory stakeholders".

Looking at the reasons at the base of the community engagement, the recurrent motifs are adding knowledge framework, because every stakeholder is a bearer of new stimuli and information, and values and identity emerging, because by giving voice to people the needs, feelings, and perspectives emerge with strength. Moreover, analyzing deeper the motivations that animate the community engagement processes, it shows two

big groups of tendencies: a planning-oriented attitude, especially found in the state and regional initiatives, and an educative-oriented attitude, primarily expressed in the local initiatives. This appears true independently from the country where the projects and the programs are carried out and reflects not only an obvious distribution of competencies amongst the different kinds of agencies and institutions involved, but also a need to deal with people's knowledge and perceptions the more is smaller the scale of action.

In terms of participative modalities, many are mentioned in the paragraph 2.1 and by reporting that discourse to the case studies analyzed, it is possible to identify two macro groups. One is the participative-oriented initiative, in which the different stakeholders are involved since the beginning of the projects and all along its development (for instance, the Village Design Statement, the Piedmont Network of Landscape Observatories, the Landscape Observatory of Catalonia, the PLACE Program, etc.), and often they are able to influence the process direction while it goes ahead. The other one is the consultative-oriented initiative, in which the stakeholders are called to join the process when it is already started, by taking part only in few phases (for instance, the PPTR of Puglia, the National Observatory of Rural Landscapes, the Landscape Character Assessment, the SPEL), or at least in the end (such as the Landscape Plan of Tuscany Region), when a final evaluation is requested about what it has been already decided by others. As it is mentioned above (see the Table 2, in reference of Pretty 1995), the consultative events are not properly participative occasions, but they should be considered more as initiatives useful for building the consensus (Sonery 2004).

In conclusion, it results hard to identify a clear and always effective method for conducting the community engagement while dealing with the landscape management and planning, because each situation has got a high number of variables that a certain participative method needs to be designed specifically. Beyond this technical aspect, all the case studies reported demonstrate that, regardless the scale of application, the number of institutions or people involved and the specific tools put on the table to reach the participative objectives, the engagement of local communities is indispensable for planning and managing the landscape, and, moreover, is fundamental to design actions that, once implemented, will be accepted and effective, just because they were decided

with people who can benefit from their effects. It means that, apart from the costs, the time and the material and human resources implied, the community engagement in the landscape planning and management is always worthy to be undertaken.

Table 3 - A synthesis of case studies analyzed respect to the community engagement methodologies and the stakeholders involved.

Case study	Scale covered (Country)	Year/s of reference	Typologies of stakeholders involved	Reasons of the involvement	Prevalent participative modalities
Village Design Statement	Local (United Kingdom)	1996	Citizens, municipal administrators, experts	Adding knowledge framework, values and identity emerging, evaluating the state of landscape conservation, designing projects, taking decisions	Consultations, workshops, surveys, project sessions, public presentations
Landscape Character Assessment	State (United Kingdom)	2002	Citizens, regional and municipal administrators, experts	Adding knowledge framework, values and identity emerging, evaluating the state of landscape conservation, building consensus, taking decisions	Consultations, workshops, public presentations, community maps ideation, visioning conference
Landscape Observatory of Catalonia	State (Spain)	2005-2009	Citizens, regional and municipal administrators, experts	Adding knowledge framework, assessing the landscape characters, values and identity emerging, building consensus, identifying quality objectives, proposing actions for conservation, valorization and transformation	Telephone surveys, opinion poll, door-to-door interviews, public consultations via web, interviews with experts, discussion groups, workshops
Scales for Perception and Evaluation of Landscape (SPEL)	State (Netherlands)	2006	Citizens, experts	Adding knowledge framework, qualitative evaluation of the landscape perception, values and identities emerging	Questionnaire surveys
Agenda Landschap	State (Netherlands)	2008	Citizens, state, regional and municipal administrators	Adding knowledge framework, evaluating projects and programs aimed at the landscape management,	Consultations, public presentations, lectures, educational activities, advertising campaigns

				building consensus	
HeriQ	Local (Europe)	2013-2015	Citizens, associations, interpretive guides, local administrators, interpretive agents and trainers	Values and identity emerging, identifying priorities for landscape valorization and protection, designing educative and interpretive projects, learning process	Workshops, study and project sessions, study visits, exchanging experiences, training sessions, practical sessions
Landscape Plan of Tuscany Region	Region (Italy)	2011-2012	Citizens, associations, regional and municipal administrators, experts	Adding knowledge framework, final evaluation of the landscape plan, building consensus	Consultations, public presentations
Regional Landscape and Territorial Plan of Puglia	Region (Italy)	2007-2010	Citizens, entrepreneurship associations, regional and municipal administrators, experts	Adding knowledge framework, ideas concourse, values and identity emerging, identifying priority for the landscape management	Consultations, workshops, area conferences, community maps ideations, public presentations, awarding events, interactive map reports, discussions for developing agreements amongst the landscape producers, dedicated forums for exchanging good practices, experimental pilot projects
Piedmont Network of Landscape Observatories	Supra-local (Italy)	2006	Citizens, municipal administrators, experts	Adding knowledge framework, values and identity emerging, learning process	Field studies, dissemination events aimed at protection and valorization of landscape, educational activities, Atlas development
Delta del Po Landscape	Supra-local (Italy)	2008	Foundation, university, regional, provincial, and	Adding knowledge framework, values and identity emerging,	Educational activities, training sessions,

Observatory			municipal authorities, Regional Park authority, associations	learning process	dissemination events aimed at protection and valorization of landscape
National Observatory of the rural landscape	State (Italy)	2012-ongoing	Universities, research institutes, regional and municipal administrations, farmers, foresters and entrepreneurship actors	Adding knowledge framework, identifying guidelines for managing and protecting the rural landscape	Face-to-face interviews, surveys, consultations
European Landscape Observatory	Inter-States (Europe)	2008	Universities, state, regional and municipal administrations	Adding knowledge framework, improving tools for protection and management of landscape	Educational activities, training sessions, dissemination events aimed at protection and valorization of landscape
PLACE Program	Town (Vermont, USA)	2001-ongoing	University, NGOs and local organizations, municipal authorities, teachers, school students, graduated students, citizens, town commissions, historical society, conservation organizations	Adding knowledge framework, identities and values emerging, designing projects for the landscape valorization, increasing awareness, learning process, building consensus	Public presentations, workshops, study and project sessions, field trips, community forums, dissemination events aimed at protection and valorization of landscape, educational activities
ECOS Project	County (Vermont, USA)	2013	Citizens, entrepreneurship actors, municipal administrators, experts	Adding knowledge framework, identifying priorities for the landscape management, creating future scenarios, proposing common actions, building consensus, values and identity emerging	Workshops, face-to-face interviews, focus groups, online surveys, public presentations
Council on the Future of Vermont	State (Vermont, USA)	2007-2009	Students, farmers, teachers, nurses, factory workers, veterans, seniors, foresters, granite workers,	Adding knowledge framework, identifying priorities for the landscape management, values and identity emerging,	Online surveys, polling, public presentations, public forums

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			advocacy groups, regional and municipal administrators, local and state organizations, VCRD experts	building consensus, proposing common actions, sharing project ideas and recommendations	
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<http://www.arcolatino.org>

BURLINGTON GEOGRAPHIC PROGRAM

<http://www.uvm.edu/place/burlingtongeographic>

Countryside Management Association

<http://countrysideassociation.org.uk/publIns/ranger/72/lca.php>

DAILY FINANCE

<http://www.dailyfinance.com>

ECOS PROJECT

<http://ecosproject.com/>

EUROPEAN LANDSCAPE OBSERVATORY OF ARCO LATINO

<http://www.osservatoriopaesaggio.eu>

FUTURE OF VERMONT

<http://futureofvermont.org/>

HeriQ Project

<http://heriq.org/>

LANDSCAPE PLAN OF TUSCANY REGION

<http://www.paesaggiotoscana.it/>

NATIONAL OBSERVATORY OF THE RURAL DEVELOPMENT INITIATIVE

<http://landscapeunifi.it/it/osservatorio-nazionale-del-paesaggio-rurale>

Observatory of Catalonia

<http://www.catpaisatge.net>

PAYSMED – THE PORTAL OF MEDITERRANEAN LANDSCAPE

<http://www.paysmed.net/>

PIEDMONT NETWORK OF LANDSCAPE OBSERVATORIES

<http://www.osservatoriodelpaesaggio.org>

PLACE PROGRAM – UNIVERSITY OF VERMONT

<http://www.uvm.edu/place/>

PPTR PUGLIA

<http://paesaggio.regione.puglia.it/>

SUSTAINABLE SITES INITIATIVE

<http://www.sustainablesites.org/>

UNISCAPE – The European network of universities for the implementation of the ELC

<http://www.uniscape.eu/>

UNITED STATES DEPARTMENT OF AGRICULTURE – CENSUS OF AGRICULTURE

<http://www.agcensus.usda.gov/>

VERMONT COUNCIL ON RURAL DEVELOPMENT

<http://vtrural.org>

CHAPTER THREE

The Ecosystem Services approach for the landscape management



Minotti M. – “Touch of yellow on the meadow” (2014).

3. The ecosystem services approach for the landscape management

In the previous chapter, the centrality of community engagement in the landscape management process has been stressed; however, it is rationale to affirm that in the landscape planning and management this aspect is not enough. Indeed, it needs another component that should deal with the functions and the processes affecting the landscape that are observable and measurable with an integrated, quantifiable and systematic approach.

For an efficient landscape management what counts, as it is seen, is that the decisions taken into consideration (all along the participatory process) do match as much as possible the needs and values of local community that will undergo those decisions in terms of actions on its landscape. Therefore, for this purpose, it become fundamental to deal with the benefits that people derive, directly or indirectly, from ecosystem functions (Costanza et al. 1997) – which are the ecosystem services (ES) - and, broadly, from landscapes.

This chapter, thus, aims to introduce the ES approach as an integrative useful tool for the rural landscape planning and management.

3.1 Studying and managing the landscape with the Ecosystem Services approach: an introduction

Contents:

- The ES are the benefits that humans can get from the landscape
- People's actions for performing the landscape management have important responsibility for driving changes (and adding values at landscape) in terms of ecosystems functions, and, consequently, related services
- A basic step for improving the landscape management is to increase and deepen the knowledge by assessing ES

In the landscape issues, a recurrent concept is that one of “services”, which emphasize the connection between physical systems and human values. Since the functional structure of a landscape system is the ecosystem, the provided services are the ES. Ecosystems are shaped by the interaction of communities of living organisms with the abiotic environment, and, as consequence, the ecosystem functions are the capacity or the potential to deliver ES and generate the realized flow of services for which there is demand (European Union 2013). Indeed, the ES are defined as benefits that humans recognize as obtained from ecosystems that support, directly or indirectly, their survival and quality of life (Harrington 2010).

People benefit from ecosystems in terms of goods and services. For example, the goods are food, drinking water, air, soil, raw materials, genetic resources, etc. And amongst the services, as the result of the ecosystemic interrelations, humans can benefit for example of natural depuration and the quality of waters, water supply, protection from erosion and floods, soil generation, assimilation of nutrients from soil, water runoff regulation, atmospheric carbon fixation, atmospheric gasses regulation, disease control, health, safety, enjoyment of the landscape, etc. This exemplificative list would say that ES represents the benefits that humans can derive from the right functioning of the different landscape units in reference of their intrinsic properties and the processes in which they develop (Santolini 2008). As a deduction, the proper functioning of the ecosystems present in the landscape units means the good quality and quantity of renewable and non-renewable resources, which constitute the natural capital. Costanza et al. (2007) consider the natural capital as the engine of survival through which the basic functionalities of ecosystems are maintained, thus the same for the linkages between the landscape quality and biodiversity.

The focus on benefits implies that ES are open to economic valuation. It needs to specify that not all benefits people derive from ecosystems are economic (indeed, they can refer to the health, culture, nutrition, safety, etc.) but they all potentially can be measured in economic terms through specific instruments such as the willingness to pay, economic incentives, opportunity costs, payments for ecosystem services, etc. (TEEB 2010). Beyond the monetary approach to measure benefits from ecosystems, it is

important to include other instruments to assess those more abstract values, such as health value, social-cultural value or conservation value (European Union 2013). The governance of the coupled socioeconomic-ecological system is an integral part of this framework: institutions, stakeholders and users of ES affect ecosystems through direct or indirect drivers of change (see Figure 3). According to Termorshuizen and Opdam (2009), basing on the human–ecological view of the landscape, “functions” can be translated into “services” when they are valued by people; one function can offer several services. Thus, functions continue to exist in the absence of people, whereas services exist because people use and value the landscape. It is also true that the stakeholders, who are affected by the provision of ES either as providers or beneficiaries, or because they would have to change land use or other management practices, affect ecosystems and their services. Therefore, the same landscape functions can be read and interpreted by subjects who have to manage the landscape according to specific priorities and purposes, by using different economic, environmental, cultural, social and aesthetic criteria (Gissi 2011).

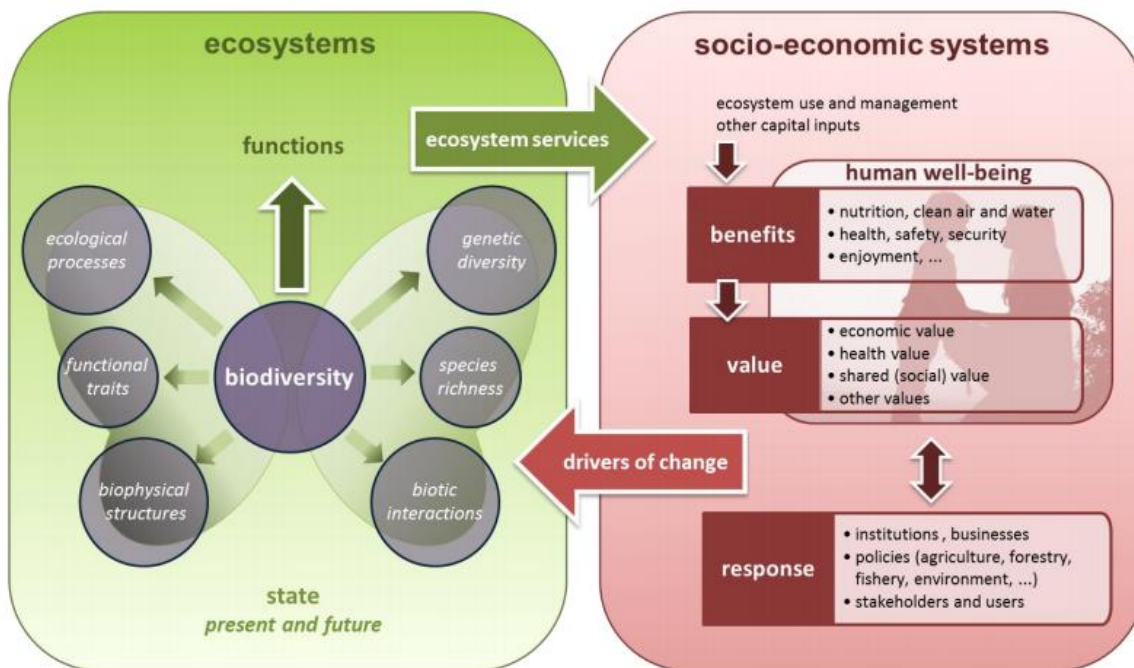


Figure 3 - The Ecosystem Services framework according to the European Union vision (Source: Mapping and Assessing Ecosystem Service – MAES 2013).

Moreover, ecosystem management and other capital inputs refer to the labor, capital or energy investments needed to obtain certain benefits (e.g. to harvest a crop, or to construct and maintain hiking trails for recreation). These measures influence ecosystems in a way to improve the delivery of certain services (e.g. food production function and landscape beauty) often at the cost of other services which ecosystems are or could be delivering (e.g. regulating services), or at the cost of the state of ecosystems (e.g. lowering biodiversity level). It is important, thus, to plan carefully the interventions and the management actions on the landscape, because where those changes imply certain new benefits for people, in the meantime they might provoke imbalances in the ecosystems functions and processes.

In terms of sustainable landscape management, humans change the landscape to improve its functioning and create additional value. Therefore, scientific knowledge should allow linking of the physical structure and functioning of the landscape to the economic, sociocultural, and ecological values demanded by its users (Haines-Young 2000). For scientific knowledge that has an impact on landscape-development processes, therefore, one important prerequisite is that desired landscape values can be related to intended changes in structure and functioning of the physical landscape (Termorshuizen and Opdum 2009).

Furthermore, it remarks the need of a trend towards a decentralized landscape planning policy (as it is also seen in the previous chapter, in the case studies analyzed). Indeed, in most democracies, state-led planning is giving way to systems of governance planning (Haughton and Counsell 2004), in which the decision-making process on landscape changes is becoming the domain of various groups of actors on regional and local scales (Brody et al. 2004; Azerrad and Nilon 2006). These actors make different demands on the landscape and hold different perceptions of the benefits that landscapes must deliver to society. This decision-making process is referred to as “collaborative planning” (Ryan et al. 2006). The trend towards bottom-up planning is based on the subsidiarity principle: as much local as possible and only so much government regulation as necessary (Berkes 2004). It is assumed that by involving local actors the sharing of management power and responsibility will result in more sustainable socioecological

systems (Schultz et al. 2007), consistently with the general message expressed in the chapter two of this thesis.

In this perspective, assessing ES means to get this kind of information:

- The state of biodiversity (considered the variety of all life on earth, it plays a key role in the structural set-up of ecosystems, which is essential to maintaining basic ecosystem processes and supporting ecosystem functions; European Union 2013) and ecosystems in general.
- The flow of ES from ecosystems to society to enhance human wellbeing.
- The value changes associated with changes in ES supply.
- Plausible scenarios and outlooks for social and economic change across countries that have positive or negative impacts on biodiversity, ecosystems and their services.

All these knowledges reveal themselves fundamental for preparing the data set useful at implementing the landscape planning and management, as it is deepened in the following paragraph.

3.2 Ecosystem Services assessment framework: from global to local

Contents

- The growing consensus in using the ES assessment approach in the framework of decision-making processes aimed at the landscape management is demonstrated by richness of international policies regarding this issue
- The ES assessment and mapping is becoming even more linked to the bioeconomy and natural capital concepts
- An applicative case study concerning the assessment and governance of ES in Natura 2000 sites from Italy is shown

3.2.1 The international policies

The widespread interest for assessing the ES have become important in the decision-making issues concerning the landscape management and planning, because of the demand for landscape services has increased from a broad range of stakeholders (Bills and Gross 2005; Palacios-Agundez 2014) for linking ecosystems to human wellbeing (De Groot et al. 2010). The concept of ES dates back at least to the 1970s but gained momentum in the scientific literature in the 1990s (e.g. De Groot 1992; Costanza et al. 1997; Daily 1997). According to the Millennium Ecosystem Assessment (MA 2003, 2005), the mainstream publication about this issue, the importance of ecosystems and their services can be expressed in terms of three different value domains: ecological, socio-cultural and economic. The ecological value encompasses the health state of a system, measured with ecological indicators such as diversity and integrity, the economic value is referred to the costs of marketed and non-marketed services, while socio-cultural values include the importance that people give to, for example, the cultural identity and the degree to which that is related to ES. Criteria and indicators are needed to comprehensively describe the interaction between the ecological processes and components of an ecosystem and their services. Two main types of indicators are needed: state indicators describing what ecosystem process or component is providing the service and how much (e.g. total biomass or leaf area index - LAI), and performance indicators describing how much of the service can potentially be used in a sustainable way (e.g. maximum sustainable harvest of biomass or the effect of LAI on air-quality) (De Groot et al. 2010). Such indicators be useful data in terms of policy-relevant measures that provide the basis for assessment and decision making (MA 2003).

Moreover, it is possible to recognize two broad kinds of values: use values and non-use value. The first kind encompasses direct consumptive use values such as the value of timber, fish or other resources that ecosystems provide, and direct, non-consumptive use values such as those related to recreation and aesthetic appreciation. Indirect use values relate to the services provided by nature such as air- and water-purification, erosion prevention and pollination of crops. Non-use value is the importance attributed to an aspect of the environment in addition to, or irrespective of its use values. A type of value in between use and non-use is the notion of option value: the value that people place on

keeping the option open to use ES in the future, either within our own life time, or for future generations (in the latter case this is called bequest value) (De Groot et al. 2002).

At global level, the strong attention to the ES management is found, at first, in the Ecosystem Approach (CBD 2000). It is a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way. Thus, the application of the Ecosystem Approach will help to reach a balance of the three objectives of the CBD: conservation, sustainable use, and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources. The Ecosystem Approach articulates in twelve principles, among whom the second is relevant for the aim of this thesis, because it states that the ecosystem management should be decentralized to the lowest appropriate level to reach greater efficiency, effectiveness and equity. This is true if the stakeholders' involvement is assured, for balancing local interests with the wider public interests. Indeed, the closer management is to the ecosystem, the greater the responsibility, ownership, accountability, participation, and use of local knowledge. The Ecosystem Approach takes into consideration all forms of relevant information, including scientific and local knowledge (Principle 11) and recalls the attention of all relevant sectors of society to attend the ecosystem management (Principle 12). It states, moreover, that the conservation of ecosystem structure and functioning, in order to maintain ES, should be a priority target (Principle 5; CBD 2000).

Still remaining at global scale, between 2001 and 2005 the Millennium Ecosystem Assessment (MA) was carried out to assess the consequences of ecosystem change and to establish the scientific basis for actions needed to enhance the conservation and sustainable use of ecosystems and their contributions to human well-being. The motivation for this milestone arrives from the government requests for getting information and a broader comprehension received through four international conventions—the Convention on Biological Diversity, the United Nations Convention to Combat Desertification, the Ramsar Convention on Wetlands, and the Convention on Migratory Species. The MA deals with the full range of ecosystems and the considered ES include: provisioning services such as food, water, timber, and fiber; regulating services that affect climate, floods, disease, wastes, and water quality; cultural services that

provide recreational, aesthetic, and spiritual benefits; and supporting services such as soil formation, photosynthesis, and nutrient cycling (MA 2005). The human species, while buffered against environmental changes by culture and technology, is fundamentally dependent on the flow of ES, that is why the conceptual framework of MA posits that people are integral parts of ecosystems and that a dynamic interaction exists between them and other parts of ecosystems. The changing human conditions determine, both directly and indirectly, changes in ecosystems and thereby causing changes in human well-being. Moreover, although the MA emphasizes the linkages between ecosystems and human well-being, it also concerns the intrinsic value of species and ecosystem, which is the value of something in and for itself, regardless of its utility for someone else. The MA was thought to be a policy-relevant document, because it supposed to provide recommendations, data and guidelines to identify priorities for actions at different scale, to understand a framework and source of tools for assessment, planning and management and to gain foresight concerning the consequences of decisions affecting ecosystems. For example, about the provisioning services, the MA states that they are being used getting over the recommended thresholds; indeed, about the rural landscape, the agricultural practices are not sustainable in some regions due to their reliance on unsustainable sources of water, harmful impacts caused by excessive nutrient or pesticide use, salinization, nutrient depletion, and rates of soil loss that exceed rates of soil formation (the MA is one further solid reference to remark the fragilities of the rural landscape expressed in the chapter one of this thesis). In terms of decision making, MA recommends a wide range of deliberative tools (which facilitate transparency and stakeholder participation), information-gathering tools (which are primarily focused on collecting data and opinions), and planning tools (which are typically used to evaluate potential policy options) to assist decision making concerning ecosystems and their services at any possible action scale.

Another important step made at global scale arrived in the period that followed the G8, in which the countries met in Potsdam in March 2007; in that occasion the German government proposed a study on “The Economics of Ecosystems and Biodiversity” - TEEB (2010) to address some challenges in ES research and implementation. The TEEB analyzes the global economic benefit of biological diversity, the costs of the loss of biodiversity and

the failure to take protective measures versus the costs of effective conservation and sustainable use (De Groot et al. 2010). Therefore, it aims to introduce some mechanisms that incorporate the values of ecosystems into decision making, through incentives and price signals. These can include payments for ES, reforming environmentally harmful subsidies, introducing tax breaks for conservation, or creating new markets for sustainably produced goods and ES needs to come along with reinforcing rights over natural resources and liability for environmental damage (TEEB 2010). TEEB has been evaluated and included in the CBD COP-10 in 2010 as a “valuation toolkit” for facilitating implementation and capacity building and the development of cost-effective policy responses. TEEB is revealed useful also for sustaining the Green Economy Initiative of the United Nations Environment Programme³⁴ for the development of a more common understanding, and for improved and strengthened communication with the private sector as well as within the business community (CBD 2010). In the COP-10, TEEB has been joint also with protected areas and other partners, included indigenous and local communities, because it has been comprised as such a meaningful tool also for measuring the values, costs and benefits of protected areas, bearing in mind the characteristics of the different biomes and ecosystems.

Zooming on Europe, an important piece of ES framework policy is the EU Biodiversity Strategy to 2020, which founding statement is "halting the loss of biodiversity and the degradation of ES in the EU by 2020, and restoring them in so far as feasible, while stepping up the EU contribution to averting global biodiversity loss" (European Commission 2011). The EU 2020 Biodiversity Strategy, which includes 6 targets and 20 associated actions, responds to both EU and global mandate, setting the EU on the right track to meet its own biodiversity objectives and its global commitments under the Convention on Biological Diversity, which requires restoring 15 % of degraded ecosystems by 2020. A special attention is posed on the agricultural sector, indeed the EU Biodiversity Strategy recalls that over half of the EU's territory is managed by farmers, that farmland delivers important ES and has considerable socio-economic value, and that funding for the CAP represents a significant part of the EU budget. Furthermore, it stresses that the

³⁴ <http://www.unep.org/greeneconomy/> [Last consultation: 02-28-2015].

CAP is not confined to the aim of food provision and rural development, but is a crucial tool for biodiversity, conservation, mitigation of climate change, and maintenance of ES (European Commission 2011: Target 3).

Important is the specific Action 5 of the Biodiversity Strategy that requires Member States, with the assistance of the Commission, to map and assess the state of ecosystems and their services in their national territory by 2014³⁵, assess the economic value of such services, and promote the integration of these values into accounting and reporting systems at EU and national level by 2020. This task brought the drawing up of another important publication regarding the ES assessment, that is MAES (Mapping and Assessing the Ecosystem Services; Maes et al., 2013). In it, the concept of ES has great potential in adding value to current conservation approaches, in particular the maintenance and restoration of ecosystems enhancing their conservation status. Furthermore, the work of MAES being done under Action 5 is an important stepping-stone to the future assessment work to be done by the EU in connection with IPBES (Intergovernmental Platform for Biodiversity and Ecosystem Services). The program of the Platform work aims to enhance the enabling environment and strengthen the knowledge policy interface on biodiversity and ES, and the communication and evaluation of Platform activities, by considering its four functions: knowledge generation, assessments, policy support tools and capacity building. Paying attention at the title of this document, the focus falls upon the term “mapping”, as first aim. The centrality of this issue in the MAES is given by the facts that maps are useful for spatially explicit prioritization and problem identification, especially in relation to synergies and trade-offs among different ES, and between ES and biodiversity. Further, maps can be used as a communication tool to initiate discussions with stakeholders, visualizing the locations where valuable ES are produced or used and explaining the relevance of ES to the public in their territory. Maps can - and to some extent already do – contribute to the planning and management of biodiversity protection areas and implicitly of their ES at sub-national level.

³⁵ About this goal, a report by the Member States is foreseen for mid-2015.

About this issue, it is worth to cite the American tool SolVES³⁶, implemented by the USGS, which is a GIS application for assessing, mapping, and quantifying the perceived social values of ES. The premise is that there are some values coming from ES that are difficult to account through the economic markets, such as cultural, aesthetics or recreational values, but they need an assessment in any case because are very important for the quality of life of the diverse social groups. These groups are distinguishable by their attitudes and preferences regarding public uses, such as motorized recreation and logging. SolVES derives a quantitative, 10-points, social-values metric, the “value index”, from a combination of spatial and non-spatial responses to public value and preference surveys and calculates metrics characterizing the underlying environment, such as average distance to water and dominant land cover. The application field of SolVES is vast and it is ideal for using it in community-based research aimed at the landscape planning.

The updating of MAES is the second working paper (European Union 2014), which is important because it provides a working guidance to the Member States on how to map and assess the state of ecosystems and of their services. The second MAES report presents indicators that can be used at European and Member State's level to map and assess biodiversity, ecosystem condition and ES according to the Common International Classification of Ecosystem Services (CICES).

CICES (Haines-Young and Potschin 2013) is a tool for describing primarily ecosystem outputs as they directly contribute to human well-being (so it is useful for classifying services and not benefits), so it potentially helps to understand the ways that humans are linked to, and depend on, nature. It is also challenging, because the connections between people and nature are complex and different specialist groups look at them in different ways. For example, some need to describe ES so that they can be mapped or valued economically. Others are more interested in how human impact on ecosystems changes their capacity to deliver services, so that appropriate policies can be developed. All these

³⁶ <http://solves.cr.usgs.gov/>

concerns imply the need for some kind of accounting system for natural capital. In accordance with MAES work and purpose, CICES has therefore been designed to help provide the clarity that is needed in all MAES applications. Indeed, ES cannot be valued, mapped or included in accounts if they cannot be described and measured.

As it is shown in Table 4, CICES provides a hierarchical structure of classification, inspired by the Millennium Ecosystem Assessment (MA 2005). At the highest level are the three familiar categories used in the MA: provisioning, regulating and maintenance, and cultural. Below these major “Sections” in the classification are nested a series of “Divisions”, “Groups” and “Classes”. It needs to specify that CICES does not consider the “supporting” category (instead, included in MA), because ecosystem outputs are regarded as things fundamentally dependent on living processes, and so abiotic outputs from nature are not regarded as an ES for the purposes of CICES.

Table 4: CICES V4.3 at the “three digit level”.

Section	Division	Group
Provisioning	Nutrition	Biomass
		Water
	Materials	Biomass, Fiber
		Water
	Energy	Biomass-based energy sources
		Mechanical energy
Regulation & Maintenance	Mediation of waste, toxics and other nuisances	Mediation by biota
		Mediation by ecosystems
	Mediation of flows	Mass flows
		Liquid flows
		Gaseous / air flows
	Maintenance of physical, chemical, biological conditions	Lifecycle maintenance, habitat and gene pool protection
		Pest and disease control
		Soil formation and composition
		Water conditions
		Atmospheric composition and climate regulation

Cultural	Physical and intellectual interactions with ecosystems and land-/seascapes [environmental settings]	Physical and experiential interactions
		Intellectual and representational
	Spiritual, symbolic and other interactions with ecosystems and land-/seascapes [environmental settings]	Spiritual and/or emblematic
		Other cultural outputs

Finally, a strong input concerning the importance of ES in the landscape management comes also from UNESCO. In the twenty-sixth session of the International Coordinating Council of the Man and Biosphere (MAB) Program it has been recognized that the conservation and sustainable use of biodiversity is a critically important challenge, thus, the loss of biodiversity results in a reduction of ES (e.g. food and fiber production, disease control, crop pollination and recreation) and will ultimately cause a direct threat for human survival. That is why the protection of biodiversity and ES become a key topic for MAB and, as consequence, the research programs need to improve resilience of ecosystems to maintain and restore ES by including actions in the MAB agenda for reaching this goal (UNESCO 2014). In this perspective, Biosphere Reserves should be model sites to conserve biodiversity and contribute to economic development and sustainable use of natural resources including environmentally, socially and economically viable models for boosting green economies and local livelihoods by providing a wide range of both direct and indirect ES.

3.2.2 A focus on bioeconomy and natural capital concepts³⁷

The continuous flow of goods and services from ecosystems to people is currently under threat if the current human activities still remain unsustainable. The recent bioeconomy strategy (European Commission 2012) is an important opportunity to halt the loss of biodiversity and the reduction of services provision, from global to local scale. In this framework, forest sector plays a fundamental role in further enhancing the

³⁷ This paragraph is partially taken from a recently published paper to which the present writer has contributed to its drawing up: see Marchetti et al., 2014.

sustainable development and the green growth in degraded environments, such as marginal and rural areas.

The need for bioeconomy-based natural resources management

The concepts of “green-growth” and “bioeconomy” have been developed on the consciousness that population is expected to rapidly raise in the next 40 years (Rosegrant et al. 201e). This trend most probably will cause an increase of pressures on natural resources use and a growing inequality for their distribution among people, especially with regards to wild and seminatural ecosystems, water resources, and croplands, and, as a consequence, an erosion of the largest part of the ES strictly related to Land Use and Cover Change (LUCC).

Overcoming these situations specifically requires responsibility in subsidiarity and innovation in order to achieve concerted changes in lifestyles and resource use, across all levels of society and economy (European Commission 2012). There are a number of key-drivers for the development of a green economy, as follows (Rosegrant et al. 2013): (i) the demand for renewable biological resources and bioprocesses; (ii) the need for improving the management and the sustainable use of renewable resources; (iii) facing substantial challenges, such as e.g. energy and food security, in the context of increasing unpleasant social phenomena like the neocolonialism (i.e. “land grabbing”) or the prevalence of export-driven cropping systems, and several constraints on water, productive lands and carbon emissions (e.g. Sheppard et al. 2011); (iv) the rapid uptake of biotechnologies in agricultural productions; and (v) the opportunity to reduce environmental degradation through more sustainable production procedures. Other important challenges derive by the fact that the bioeconomy proposal is not about protecting the environment, but instead it is about promoting the economy – in spite of clear indications of the harmful impacts that are already resulting from massive new demand for biomass, including soil loss (a long-term renewable resource), biodiversity at gene, species, stand and landscape level, as well as escalating hunger and conflict (Hall et al. 2012).

Taking under consideration the past human-induced changes and their consequences on the increasing depletion of nature, the current stock of natural capital is almost compromised and is passing through several safety thresholds of planetary

boundaries (Hughes et al. 2013), such as the CO₂ atmospheric composition, i.e. gaining 395 ppm in 2013, despite a tipping point of 350 ppm (Hansen et al. 2010). The key necessary condition for achieving sustainability lies at least on the constancy of the natural capital stock over the time (Pearce et al. 1990). In this way, natural capital properly refers to “a stock that yields a flow of valuable goods and services into the future” and can be differentiated into “renewable natural capital (active and self-maintaining using solar energy, such as forest growing as known since the XVIII century) and non-renewable natural capital (passive)” (Costanza and Daly 1992). For instance, to sufficiently unravel the past anthropogenic effects on natural resources and the more recent shifting from Holocene to Anthropocene era, Ellis and Ramankutty (2008) globally identified and mapped the “Anthromes”, namely Anthropogenic Biomes. In this way, the evaluation of ecosystem functioning (including biodiversity as main supporting element; see e.g. Cardinale 2013) is extremely important to globally reduce the impacts of the main drivers of change. For this purpose, monitoring the land use changes (one of the most accelerators of human-induced environmental modifications; Foley et al. 2005) is useful to orient the current overexploitation of natural resources towards a more “resilience-based” trajectory (e.g. Ellis et al. 2013).

Green economy and natural resources

To operationalize these broad guidelines, it is useful to recall the Ecosystem Approach by CBD (2000) - mentioned before - as a method for sustaining or restoring natural systems and their functions and values. It is goal-driven approach, and is based on a collaboratively-developed vision of desired future conditions that integrates ecological, economic and social factors (Inter-Agency Ecosystem Management Force 1995).

Therefore, only an ecosystem-based management of natural resources can halt the loss of biodiversity and the degrade of resources quality. This is exactly one of the purposes of the Bioeconomy Strategy, properly aimed at improving the knowledge base and fostering innovation to increase productivity, while ensuring sustainable resource use and alleviating stress on the environment (COM 2012).

According to the evolution of classical economic theories, the need to consider forests, for example, both as factors of production and ecological infrastructures is always

stronger. In particular, the contribution of forest management and land use planning (especially in fragile forest areas, as mountain environments) in the context of green economy growth has to consider also the biodiversity of forest ecosystems and the related ES as results of complex ecological processes and interactions amongst different ecosystems in a holistic view (Ciancio and Nocentini 2004; Mace et al. 2012).

Although natural resources have an intrinsic value for improving sustainability, the vision of the natural capital has become the subject of ethical and conceptual discussion and debate, especially in conservation topics. This led to divisions between those who intend the conservation of nature as such, by virtue of its intrinsic or existence value with an assessment meaning (Soulé 2013), and those, instead, who intend it as an element of supporting for human well-being (e.g. Reid et al. 2006; Kareiva and Marvier 2012; Toledo and Barrera-Bassols 2014), translatable, therefore, in an instrumental value. Nevertheless, in recent years, the concept that the integration of different views and philosophies underlies the conservation, protection and restoration of natural resources has been clarified (Tallis and Lubchenko 2014).

The Chart of Rome: linking natural and cultural capital

The need of a strong interconnection between the natural and cultural capital assets is well expressed in the “Chart of Rome” (Presidenza Italiana del Consiglio dell’Unione Europea 2014), whose aim is to broaden the scope of nature and biodiversity policy without changing it, but rather mainstreaming it into other policies related to the territory and the economy. Although the main target groups of Chart of Rome (CoR) are scientists, stakeholders and policy-makers, its message is also for citizens. CoR is a European initiative and develops on the EU cornerstones of Natura 2000 and the EU Biodiversity Strategy to 2020. The primary role of CoR is the promotion of a better conservation and valorization of the natural and cultural diversity. Moreover, the CoR acts as a platform for further collaborations on biodiversity in general, and in particular on ES, as well as on their societal implications (i.e. climate mitigation, clean water, clean air, protection against floods and erosion).

Furthermore, the CoR finds its roots in the CBD, specifically with regards to protecting and encouraging the customary use of biological resources in accordance with

the traditional cultural practices that are compatible with conservation or sustainable use requirements (UNEP, 1992). CoR is strongly connected also with the Convention for the Safeguarding of Intangible Cultural Heritage, because communities and groups are able to constantly recreate their intangible cultural heritage, since it is the product of the interaction between nature and history, and it is transmitted from throughout generations, according to the environment they live in. In this way, people enhance their own sense of identity and continuity, and, as a consequence, promote the respect for cultural diversity and human creativity (UNESCO 2003). Another bridge built by the CoR with the EU biodiversity-related policies is the Green Employment Initiative (European Commission COM/2014/446). This initiative aims at indicating the way for job creation potential in the green economy sector with reference to skills, education and training, green public procurement, promotion of entrepreneurship, increasing of data quality (including statistical definition of employment in the environmental sector) and promotion of social dialogue.

CoR is strongly related to the adaptive capacity of human populations to deal with and modify the natural environment (Berkes and Folke 1992), the natural capital, which is composed by the ecosystems. Therefore, healthy and resilient ecosystems can provide society with a full range of economically valuable goods and services. To maintain healthy ecosystems, the following responsible actions are needed (Presidenza Italiana del Consiglio dell'Unione Europea 2014): (i) making use of good knowledge and data on biodiversity, ecosystems, their structures and functions, and on links with ES and associated benefits; (ii) maintaining, restoring and enhancing capacities to provide a range of goods and services and associated benefits; (iii) exploring natural capital as a solution to major challenges such as those related to urban areas, climate change and adaptation, agriculture and soil, forestry, hydrological risks, tourism and recreation. In this sense, good knowledge, research and data gathering on biodiversity and ecosystems are essential, because they make the knowledge base accessible to citizens and decision makers, thus ensuring that policy-makers continue to understand and consider complex environmental state and dynamics.

In addition, cultural and economic scientists (e.g. Throsby 1999) contributed to identify cultural capital as a set of three main features, such as (Sukhdev et al. 2014): (i) knowledge, including traditional and scientific dimensions; (ii) capacities, as the way knowledge is retained, increased, elaborated and developed; and (iii) practices and human activities producing tangible and intangible flows of goods and services.

In order to maintain a positive link between cultural and natural capital, the following goals have to be reached (Presidenza Italiana del Consiglio dell'Unione Europea 2014): (i) taking into account social and cultural dimension of ecosystem management; (ii) promoting locally adapted knowledge, capacities and activities with positive impacts on natural capital; and (iii) connecting benefits, goods and services from ecosystems (supply) with patterns of culture, society and economy (demand). Moreover, green infrastructures can contribute to these goals, since they connect natural and semi-natural areas with urban and rural areas. They are also drivers of a transition towards a green economy and are able to guarantee many natural, cultural, social and economic linkages. In Italy, the recent report concerning the socio-economic assessment and monitoring of natural capital and Protected Areas (PA) is the first attempt to contribute to the pillars of green economy at national level (MATTM and Unioncamere 2014). The report results mainly reveal what is the current condition about biodiversity conservation, what ES are correlated to cultural capital and local communities, and how sustainable practices effectively contribute to the green economy concerns.

Even if green economy-related contributions are increasing, the concepts of natural capital, ES, and cultural capital require further operational definition and understanding. A knowledge-based improvement of the concept and its operationalization are in line with the EU nature and biodiversity strategies, directives and overall policies, which are expected to enhance and promote biodiversity conservation, the sustainable use of natural resources, while improving communication, mainstreaming and policy consideration in a wide societal and political context (Presidenza Italiana del Consiglio dell'Unione Europea 2014).

Monitoring changes of natural capital: land use and ES relationship

An important issue in many debates concerning the policies and the governance of the landscape is the ES assessment, as it is seen in the previous paragraphs. While analyzing and evaluating ES, the anthropogenic impact on ecosystem functioning and, therefore, its ability to provide a set of services (and, consequently, benefits) must be considered. During the evolutionary history, humans excelled due to their ability to model ecosystems throughout the use of tools and techniques, which are beyond the capabilities of other living organisms (Smith 2007). Therefore, the importance of the "human factor" is essential: currently more than 75% of the land in the world shows disturbance caused by human action, with less than a quarter remained as wild land, able to support only 11% of the net terrestrial primary productivity (Ellis and Ramankutty 2008). Consistently, some scientific theories define Anthropocene as the current time that the Earth is living (Zalasiewicz et al. 2008). Lambin et al. (2001) stated that LUCC: (i) has a strong impact on biodiversity at a global scale; (ii) contributes to climate change at the local and regional level; (iii) represents the main source of soil degradation and water depletion; (iv) alters ES and affects the capacity of a natural systems to support human needs. These is indisputable evidence linking changes in the use / land cover to the loss of ES, especially in cases of services as carbon sink, hydrological processes and climate change. A complete ES assessment must be considered as spatially explicit, because it serves as a basis to implement LUCC (and therefore the human impact), as well as to provide a complete overview of offered services, including their current availability and future-oriented simulation (modeled according to various hypothetical scenarios). Furthermore, mapping ES can provide and facilitate the economic evaluation, and the balance (trade-off) amongst multiple ES, which is necessary to support decision-making and landscape planning processes (Chirici et al. 2014).

The use of monitoring tools, such as Land use / Land Cover Inventories (Inventario dell'Uso delle Terre in Italy - IUTI; Corona et al. 2012) allows to identify and quantify in a quick way and at low cost the key dynamics characterizing the landscape changes, as well as the monitoring of their impact in ecological and functional terms (Sallustio et al. 2013; Marchetti et al. 2012b; Corona et al. 2012). As an example, for the period 1990-2008 in Italy the following important changes have been identified: (i) the forest area has increased of about 500,000 ha. At that time, the urban areas have expanded of the same

amount, especially to the detriment of agricultural land, which recorded a loss of about 800,000 ha; and (ii) the registered urban sprawl can be mainly referred to the downhill and plain territories, and correlated to the increasing pressure on already fragmented and degraded ecosystems. The recovery of human-modified landscapes is necessary to create a socio-economic cohesion between urban and forest area. Furthermore, re-creating the lost agricultural fabric offers enormous ecological potential, including e.g. the reduction of fragmentation and degradation (especially of soil), a significant increase of biodiversity (creation of corridors and ecological niches) and the recovery of an important band transition having the function of mitigation systems between natural and manmade assets (vacant land or derelict land; Marchetti and Sallustio 2012). Delivering and keeping the identity to the rural landscape increases the awareness about the primary sources location of power and energy in urban areas, thus enhancing processes of historical and cultural identity, and improving health and social welfare.

It is important to note that the trends observed at the national level in Italy are not very different from those observed within the National Parks, both for land cover modifications and services provided (Marchetti et al. 2012a; Marchetti et al. 2013a). This trend directly reflects on the landscape planning development, especially taking into account the problem of maintaining grasslands, pastures and agricultural activities of extensive type, which are important for the historical, economic and cultural landscapes heritage, and are essential elements for the conservation of the environmental mosaic, which is typical of the Italian peninsula and of its biodiversity (Marchetti et al. 2013b). Taking apart how the urban sprawl develops over the time, it is important to deeper understand in which way policy instruments and regulations are currently used and implemented in these areas (also within PA). For instance, the abandonment of silvicultural practices within National Parks and High Conservation Value Forests (HCVFs; Maesano et al. 2011) can reduce the forests growth and productivity, making them less resilient while facing natural disturbances (pest outbreaks, forest fires, etc.).

While contrasting the urban sprawl phenomena, agriculture represents a key activity, because it is able of recreating a balanced landscape by preserving areas that are not built-up and, where possible, by restoring ecological integrity of degraded and

fragmented environments (i.e. mountain areas). Farming is the essential and long-lasting territorialization factor, as well as the energy basis of the life cycle in the country. However, it can become central to a regenerative vision of the landscape only if integrated with the ecological characteristics. The productive function of the countryside must be flanked by the importance of the concept of its capacity to be a producer of social cohesion, of a good and healthy environment where people can live a quality lifestyle, feeling a sense of belonging. By the contrary, from the urban point of view, there is mainly the problem of defining, perceiving and recognizing the countryside as an area where food and energy come from, according to conceptual models which focus on the ecological footprint (Wackernagel and Rees 2004; Iacoponi 2011).

Moreover, the participatory aspect is necessary in order to carry out one of the founding principles of the ELC (Council of Europe 2000), as well as that of the Italian Constitution, which underlines the fundamental need of enabling local participation in decision-making processes at landscape level (articles 3 and 9). Participation has not to be considered as a simple accessory to democracy, but as a real possibility that local communities have, on different levels, to influence and orient the decision-making processes within a given area, irrespective of their individual, specific interests (Settis 2010). Indeed, the engagement of stakeholders may increase the likelihood that environmental decisions are perceived as holistic and fair, accounting for a diversity of values and needs and recognizing the complexity of human-environmental interactions (Richards et al., 2004). Furthermore, in a shared management strategy of the landscape, which takes local interests and concerns into account primarily at an early stage, it may be possible to inform the project design with a variety of ideas and perspectives. In this way, public participation increases the likelihood that local needs and priorities are successfully met (Reed 2008). By establishing common ground and trust between stakeholders, participatory processes have the capacity to transform adversarial relationships and find new ways for participants to work together (Stringer et al. 2006). This may lead to a sense of ownership over the process and outcomes, thus enhancing long-term support and active implementation of decisions (Richards et al. 2004).

Considering the above-mentioned issues, it is important to remark that managing the landscape is another of the many duties carried out by the agricultural establishments, with economic and labor-related repercussions, which factors that cannot be ignored in transitional periods such as that of today. The main goal is to create a new culture, which, while starting with the enterprises, can stimulate interaction amongst businesspeople, public authorities and professionals in order to shape new ways for organizing the land. This takes into account the close connections between urban areas, nature and the world of farmers to guarantee that the principles of sustainable development are fulfilled. This action way can be possible if local and scientific knowledge are integrated to provide a more comprehensive understanding of complex and dynamic natural systems and processes (Reed 2008).

Perspectives for the future implementation of bioeconomy

The nodal points lie in the efficiency evaluation of conservation strategies, the assessment and monitor of ES, and in the ability to translate these measures in estimating the cost implications. Similarly, the analysis of ES shall provide an integrated and holistic approach, which has to be able to grasp the complexity of functional processes. For this purpose, there are several tools available for orienting conservation policies, such as e.g. the use of biophysical indicators (e.g. Noss 1999), the mapping of natural resources and habitats (e.g. Weiers et al. 2004), and the implementation of economic instruments for the market of "natural products" (e.g. Engel et al. 2008). Time and spatial scales (at which conservation strategies are planned and the effects assessed) are also key issues in mapping ES and related changes. It should be always kept in mind how the resilience of natural systems and their adaptability and susceptibility to change go far beyond the administrative limits or times of programming and planning. Indeed, there is also a "resilience thinking", which describes the collective use of a group of concepts to address the dynamics and development of complex socio-ecological systems (Folke et al. 2010). This implies a profound reflection on how, where and who has to deal with conservation, preferring detailed, solid and shared strategies to "niche" policies (Pressey et al. 2007).

Furthermore, the economic evaluation, despite much closer to a utilitarian view of natural resources, is currently the most effective tool to persuade and influence the

people choices, especially waiting for the consolidation of a collective consciousness, more sensitive to the issue of conservation and use of natural resources in general. In this perspective, it is therefore also necessary to review the strategic role of PA. It is no longer enough to establish new PA or expand the existing ones, but it is necessary to strengthen and make more efficient and effective the management in existing ones (Watson et al. 2014). PA must be not only "Shrines of Nature", but real laboratories in which testing the best practices to enhance the natural and cultural capital can be to be exported and implemented in heavily populated surrounding matrix.

In order to determine, and subsequently improve the competitiveness and the role of the agricultural and forest sectors in relation to other productive sectors as part of the bioeconomy, governments, public administrations, and sector managers need a complete picture of the stock, streams, and balance of costs and benefits of services provided by agri-forest ecosystems.

Therefore, investments have to be oriented towards the improvement of management practices in existing forests and agroforestry systems, in order to ensure the continuous supply of the widest range of services provided. In this context, the development of new methods for supporting planning processes and especially to improve the ability to transfer the skills and knowledge to policymakers are essential elements for implementing the pillars of bioeconomy and green growth, also in the agricultural and forest sectors.

At conclusion, the future-oriented research is expected to be interdisciplinary and multi-purpose, and able to translate theories and concepts in models and methods particularly suitable for analyzing the status quo and the potential impact of different policy scenarios and management on ecosystem resilience. In the frame of bioeconomy, research is called to provide scientific bases, models and decision support tools for implementing sustainable growth and local development, which have their roots on paradigms less anthropocentric and more focused on coupling human and natural systems.

3.2.3 Making Good Natura: a case study from Italy

In this paragraph, it wants to report a case study regarding the implementation of the ES assessment, mostly referring to the economic domain, at the governance of Natura 2000 sites in Italy, with the aim of giving an idea of how the thinking line for improving the landscape management by using such tools like the ES assessment is going on in current time.

It is about a LIFE+ project of the sector “Environmental Policy and Governance” called MGN - Making Good Natura³⁸ (the extended title means: Making public Good provision the core business of Natura 2000) and it is a four year project, still in course (2012-2016). Its goal is to develop new ways of environmental governance aimed at the agri-forest ecosystem protection and to carry out evaluative methods of ES in biophysical, qualitative and quantitative terms, applied specifically in the sites of Natura 2000 Network.

The project focus is to create the conditions for achieving an effective management of habitats and species (both animals and plants) designated by the Habitat Directive (92/43/EEC) and Birds Directive (79/409/EEC), providing to the administrators of Natura 2000 sites some instruments of governance and self-financing so to have a remuneration from the actions of nature protection.

The self-financing instruments considered feasible for the project goal have been chosen among the wide range of governance and management tools, referring to the environmental policy mixes, including both command and control approach and market based instruments (Ackerman and Steward 1985; Freeman 1997). The latter are instruments that provide incentives for undertaking particular actions (OECD 2004; OECD 2008), such as price-based instruments (taxes and charges), liability instruments, subsidies, market creation measures and assignment of well-defined property rights and other instruments, such as environmental agreements (EA) for biodiversity conservation. EA consist of legal frameworks for contracts between a landowner and another part, where the landowner voluntarily commits himself to refrain from land use (conservation

³⁸ <http://www.lifemgn-serviziecosistemici.eu> [Last consultation: 02-28-2015].

contracts) or to carry out activities conserving or promoting biodiversity (management contracts) in a specific area. The other part (either a private or a public participant) makes a financial payment in return that can take different forms such as money transfer, tax exemptions or reduction (subsidies), or a credit (for instance, in the case of carbon market). In this framework, for the Life project particular attention has been paid to Payments for Ecosystem Services (PES), defined as voluntary transactions where a well-defined ES (or land-use likely to secure that service) is “bought” by at least one ES buyer from at least one ES provider, if and only if the ES provider secures ES provision (conditionality) (Wunder, 2005; TEEB, 2011).

Currently, the Life+ project MGN is developing in 21 pilot sites of the Natura 2000 Network, covering a total surface of 90,239 ha. These sites represent a wide ecosystemic and socio-economic diversity in the Italian context, even because the project involves seven Regions (Basilicata, Calabria, Campania, Emilia Romagna, Marche, Lombardy and Sicily) and three biogeographic regions (Alpine, Mediterranean and Continental).

In order to collect specific data of the Natura 2000 sites and their management characteristics, questionnaires were submitted to the management authorities of each site. Specifically, the data collected concerned: (i) general information of the interviewee; (ii) description of the Natura 2000 site under ecological, administrative and managerial point of view; (iii) economic and financial resources for managing the area, such as change of land cover and landscape in the last years and the relationship between this change and site creation, state of conservation of the habitats, present forest and agricultural activities within the site and other economic issues, difficulties and threats for the maintenance of protected habitats due to social-economic activities, stakeholders involved directly and indirectly in managing the site; (iv) information on main ES provided by the site on the basis of management authorities’ in-depth knowledge of Natura 2000 sites, fauna species threatened by habitat fragmentation, fund raising actions, self-financing and PES or PES-like schemes implemented (Wunder, 2005; Pettenella et al., 2012).

Furthermore, another useful source of information for defining main ES for each study sites were public meetings with institutional and private stakeholders during the

preliminary project phase. Indeed, specifically to identify the ES, two methodologies were combined: the study and analysis of habitats and land use of the areas were used to determine qualitative values among ES; the questionnaires with the management authorities and the stakeholders' meetings were useful to understand the level of importance attributed by local people to the resources of their landscapes and stakeholders' needs. The participants' opinion revealed very helpful to focus on the issues they perceived as the most important and to confirm preliminary ES evaluation for the area by fostering a discussion about potential suppliers or buyers of ES. The multiple approaches used in the evaluation (habitat-based, CORINE-based, survey-based) allowed to get both objective and subjective information about the ES features of each area; moreover, they revealed two perspectives: one of the territory (consisting of habitats and land covers with potentials for ES provision) and the other of the managers and stakeholder (related to social demand or expectation for ES). The two perspectives, in some cases, lead to different results, even opposite; such divergence may provide useful insights on potential conflicts or limitations to natural resource uses (Marino et al. 2014b). In general, if there is a strong difference of perceptions amongst the beneficiaries about the importance of some ES, achieving the conservation objectives in the Natura 2000 sites will result harder than in other sites where local communities are more in line with the management strategies of their landscape. Moreover, if the direct and indirect beneficiaries have a low perception of the ES, as consequence their availability to pay for having an access to them will be scarce, determining a hard carrying out of the protection and the sustainable use of natural resources (Marino et al. 2014a). For example, the high expectation for water supply by a relatively scarcely producing area might reveal an important issue for the region: high demand for a particular ES and scarce supply potential. On the contrary, in other cases, a diffused agreement was found amongst stakeholders and management authorities, like for the aesthetic and recreational ES of their landscape (*ibidem*). Such interpretation, obviously, has been considered only as an indicator to be verified by data and to be grounded by further surveys. At the best case, the proposed assessments in the participatory events can support better-informed decisions; at the worst one, these can guide further research efforts towards the most relevant issues for the site or the context.

Furthermore, the involvement of different public and private stakeholders during the meetings was very important for two reasons: first, for communicating project's objectives to all potential beneficiaries or suppliers of ES, and secondly, for defining a shared working framework among project's partners, management authorities and stakeholders for implementing a new evaluating system of the management effectiveness. During the meetings, it was found that local stakeholders are generally aware of the value of ecosystems they manage or they rely on (Marino et al. 2014b). However, since the majority of study sites are agri-forest landscapes, especially farmers perceive protected areas and their conservation measures only as a limitation and not as an opportunity for their business. This is due to the complexity of the regulatory framework and to the lack of sources of incomes in these rural areas. The main consequence is the land abandonment (as it emerged also in the chapter one of this thesis) that is likely to produce negative effects on the biodiversity of natural and semi-natural ecosystems (especially in agri-forest landscapes) and on the services they provide.

While the first phase of the Life+ project MGN a framework for developing local ES governance schemes has been defined, the subsequent steps were dedicated to create different local working groups amongst project's staff and local stakeholders focusing on specific ES. When this process, still in course, will end, it is expected to define a financing scheme (a public-private payment schemes and/or a self-financing model) that involves buyers and suppliers of ES and that can be potentially implemented in the site's area. This is crucial to increase both the cost-effectiveness of management and the availability of funds for Natura 2000 network and to reduce the already mentioned land abandonment, the major threat for habitats and species conservation (Falcucci et al. 2007).

Just regarding the payment schemes, it has been noted a different approach between site managers and local communities for selecting the most important ES. Site managers, for example, have often chosen the habitat for biodiversity service as a priority, but without any consideration of hypothetical PES or PES-like schemes to implement with local stakeholders (Marino et al. 2014b). Nevertheless, as far, the participatory phase has given some interesting results in terms of ES identification and choice that will allow deepening the analysis with local communities and stakeholders to

define and implement a sustainable financing (or self-financing) scheme. According to the authors, arranging payments for the benefits provided by natural ecosystems is a way to recognize their value and ensure these benefits in the future. Further, the recent new CAP defines a positive framework for the development of PES schemes, indeed the European Commission has identified these financing instruments as some of the most innovative ones for the CAP 2014-2020 (Marino et al. 2014c). PES and PES-like schemes can encourage the maintenance of natural ecosystems through environmentally friendly practices that preserve natural resource also improving wellbeing in rural areas (Wunder et al. 2008).

This project is revealing that the quantification of the costs relating to the management of the sites of Natura 2000 Network is hard to achieve, mostly because of lack of adequate information. However, investigating in this direction is crucial for developing a systematic approach to environmental accountability for measuring and evaluating management effectiveness of Natura 2000 sites and redefining their conservation strategies (Marino et al. 2014c).

The Life+ project MGN, thus, aims to improve the management effectiveness of Natura 2000 Network sites with an innovative governance approach of ES able to reconcile different visions for the development of economic activities by making a shared framework in which all the possible stakeholders can talk together and reach their own individual objectives, by also contributing to maintain the natural capital.

3.3 Assessing cultural Ecosystem Services in the landscape: the role of perception

Contents:

- In the studies and researches about the ES assessment, the ecological and economic domains are more investigated rather than the socio-cultural one
- For implementing an effecting decision-making process aimed at the landscape management, the early involvement of stakeholders in the ES assessment is requested

- The landscape perception of people is the first element that needs to be assessed
- Introducing methodologies to investigate ES perception by stakeholders can improve the knowledge for informing the decision-making process aimed at the landscape management
- Multiple case studies are reported

While in the previous paragraphs the ES assessment issue has been dealt with mostly the biophysical and economic keys, here it wants to underline the socio-cultural domain.

3.3.1 Critiques to the usual Ecosystem Services assessment methods

In the last years, ES research has been shaped by the integration of ecological and economic perspectives, which has contributed to a better understanding of human–nature relationships (Turner and Daily 2008); however, several important factors to consider in ES research have been overlooked by these economic and ecological approaches (Chan et al. 2012b). For example, to date, most studies have focused primarily on monetary and biophysical perspectives, while very few studies have chosen to explore socio-cultural preferences regarding ES (Vihervaara et al. 2010; Martín-López et al. 2012; Nieto-Romero et al. 2014). Despite this general tendency, it needs to remark that cultural services are regularly mentioned as a category of ES and thus recognize as important; they includes all non-material ecosystem outputs that have symbolic, cultural or intellectual significance (Maes et al. 2013). However, the incorporation of such services into decision-making processes remains far behind that associated with more tangible services (De Groot et al. 2002; MA 2005; Chan et al. 2012a).

Ecological assessment tools are not designed to assess human perspective and economic assessment tools that rely on monetary measures often do not accurately identify and value cultural services, whose value would be more accurately measured in cultural or spiritual terms (Orenstein and Groner 2014). Moreover, a recent study (Nieto-Romero et al. 2014) indicated that monetary approaches and provisioning ES are attracting most of the scientific attention, possibly jeopardizing the regulating and cultural services provided by these ecosystems. Thus, there is a lack of integrated

approaches that consider the three dimensions of sustainability, i.e. biophysical, sociocultural and monetary. Hence, the value of ES should be assessed by focusing not only on the biophysical and the economic dimensions, but also on the socio-cultural dimension (Cowling et al. 2008; De Groot et al. 2010), as these three value dimensions can provide complementary information about ES (Martín-López et al. 2012). Moreover, most studies did not use primary data or involve stakeholders in the assessments and scarce evidence was available regarding ES provided under different management alternatives (Nieto-Romero et al. 2014). In addition, non-economic valuations are particularly appealing, as they offer insight into the motivations for conserving ES, which are frequently invisible in monetary valuations. Socio-cultural valuation approaches appear to be appreciated in understanding the diversity of values emerging from the ES spectrum and in analyzing how human well-being may be affected by ecological change (Oteros-Rozas et al. 2014).

Therefore, what it mostly lacks is, in practice, cataloging or identifying priority ES on the basis of stakeholders' input, which means, more in general, the explicit inclusion of people in ES studies (Seppelt et al. 2011; Iniesta et al. 2014). As a result, socio-cultural values (i.e., social needs, perceptions and preferences towards ES) are currently missing or poorly investigated in the assessments (Bryan et al. 2010; Chan et al. 2012a).

Menzel and Teng (2009) strongly sustain this critique; indeed, they are skeptical that efforts in ES research can really include the human dimension and stakeholders, because the projects are driven by biophysical data and (formally educated) experts. Moreover, the ideas and concepts about what constitutes human well-being remain abstract, general, and static; and the projects involve people and their actual values very late in the process. They also state that separation of identification of services from their valuation, as currently practiced, suggests that ES can be defined without reference to values and thus that ES can be understood as a purely scientific concept. According to the authors' point of view, ES projects can appear to involve stakeholders only because researchers desire to enhance acceptance of their proposals, rather than because researchers are open to the enclosure of different perspectives or values that are a product of including stakeholders in the process. In summary, ES concept can hinder

communication instead facilitating it and it might not encourage negotiation between users on the basis of their needs and values; rather, in the worst case, it aggravates conflicts that result from stakeholder activities. To avoid these negative effects, they strongly suggest that local human values and needs have to be included explicitly in ES projects by encouraging stakeholders within ecosystems under investigation to direct data gathering and to jointly identify and define ES in cooperation with natural and social scientists. Therefore, human dimension has to be included early and explicitly in these projects and one way to do this is by involving stakeholders in the research through participatory processes (as it has been remarked in the previous chapter of this thesis: see Participatory Action Research in paragraph 2.5).

Acknowledging the ES assessment as a tool able to integrate diverse stakeholders into a more participatory policy and planning (Maynard et al. 2010), thus ES assessment should be a social process that includes social learning (Orenstein and Groner 2014). As the social sciences (sociology, anthropology, environmental psychology, and political science, for example) are people-centered disciplines, their research approaches and paradigms can be well suited to defining and integrating stakeholder concerns into policy and landscape planning. Rogers and Schmidt (2011) suggest that social scientists can contribute to ES assessment particularly in the realm of stakeholder integration, including the scientific identification of stakeholders for further research, identifying values, needs and perceptions of stakeholders and finding the potential impact on stakeholder groups of various ES management scenarios. Chan et al. (2012a) note that neglecting cultural values and services in ES-related programs can decrease the chance of successful implementation of the program.

Those stakeholders who participate in land-use decisions and planning can influence the effect of indirect and direct drivers of change. At the same time, drivers of change shape the stakeholders' well-being and ES flow, activating that circular motif "landscape-people-landscape" mentioned in the previous chapter. Therefore, ES, drivers of change and well-being are the elements to be use for assessing the stakeholders' perceptions of the landscape (Iniesta-Arandia et al. 2014).

3.3.2 The assessment of landscape starts from the perception

Across the entire thesis so far, the concept of perception has been mentioned multiple times, under different lights, but always related with the management and planning processes concerning the landscape as a fundamental pillar. Here it wants to highlight a twofold aspect of this concept: first, how essential is the assessment of the landscape perception in the decision-making processes, and, secondly and consequently, how hard is to include the landscape perception into the ES assessment framework.

The landscape is the result of the perception, since before the action of people who live it. As the ELC reminds, the objective reality of the territory is shaped by the interaction between the nature components and the anthropic activities and it becomes landscape only when the act of perception happens by the people who shaped that territory. If it is clear that the landscape is that “image” of the surrounding perceived by people, under the planning point of view, the strategy for the valorization, conservation and management of the landscape cannot prescind from investigating that collective and shared image, whatever if it is current, real, coveted or ideal. Therefore, the landscape planning has to deal with this image that is not easy to define at all, both for a practical problem regarding of how to reveal such a perception, and for a substantial problem concerning the subjectivity of the vision, which is influenced by several factors, first of all the cultural background of the observer.

On this purpose, Bourassa (1990) distinguishes three components of the landscape perception: one innate (or instinctive), one social and one individual. The innate component is related to our genetic heritage and is common to everyone, instead the individual and social components derive from the learning phases in relation with the different development stages of a person. More in depth, the innate perception is strongly connected with all those schemes that call back the savanna landscape (as it has been remarked in the paragraph 1.2.1). More complex and variable are the social factors that determine the perceptive value, because they are correlated with the group of belonging and the cultural changes in time. Indeed, transformation in environment is one of the process through which a social group try to affirm its own identity (Tempesta 2011). Finally, the more individual component depends on multiple factors such as the

education received, the jobs carried on, the social statuses, etc., and it is attributable to some typical elements of the western culture transmitted by the secondary education. While the benefits of the social and innate components are connected to a sense of safety for being in a known environment, those of the individual component can be attributed to the need of beauty that human has shown from a certain phase of his evolution, witnessed in the emergence of the first artistic artifacts.

People who deal with the landscape planning and management have a great responsibility and it appears very clear if considering what Gambino and Cassatella (2010) suggest, namely that a beautiful landscape – of course, as perceived by people who live, frequent and transform it – derives from a territory that works well. Indeed, the purpose of the planning is to read the landscape as a mirror of the relationship between society and territory; the quality of the landscape is not the cause of people's well-being, rather it becomes symptom of their well-being (Ferrario 2011). Moreover, the landscape perception brings another aspect to which pay attention in planning issues that is the different visions expressed by the insider, who lives that landscape every day, and the outsider, who can be a traveler or a tourist. Insiders and outsiders are the bearers of the needs and expectations concerning the landscape management. They see the landscape in partial and different way (Cosgrove 1984), so investigating their perceptions means to contribute to have whole idea of what really a landscape is and in what direction the management has to be driven.

Many case studies demonstrated that discerning people's different perceptions (by their professions, cultural elements, for example) helps to inform the decision-making process, as it follows.

Kohsaka and Handoh (2006) investigated the public perceptions about the issues of close-to-nature forestry by using pictures of three different conditions (timber, cut wood, naturally dead wood). The test was submitted to two heterogeneous sample groups, one from Germany and one from Japan, properly to testify if there was a different cultural approach to forest landscape perception. And it was, because while the Japanese respondents clustered the pictures according to a scheme "dead versus alive", the

German respondents gave a result translatable in “human-caused death versus rest”. This demonstrated that between the two populations there is a different vision of the forest landscape, and because this is rooted in their respective cultures, it influences the forestry management practices conducted differently in the two countries.

In Scandinavia, Ode et al. (2008) posed the problem of how to measure the landscape perception. They carried out a theoretical framework by establishing a link between the landscape aesthetic theory and visual indicators with the purpose of describing the landscape change over time, even assuming the Landscape Character Assessment (explored in the paragraph 2.2.2 of this thesis) as a reference approach (but only encompassing the visual character of the landscape) and as a tool to include issues of the experience of landscape (among others) within management, planning and monitoring (Wascher 2005).

Their framework consists of nine concepts of visual landscape character considered important in landscape aesthetic literature and the provision of indicators related to these different aspects of the visual landscape (see Ode et al. 2008 for the complete discussion). These nine concepts are descriptive rather than normative and they refer to landscape visual character rather than visual quality. They are: complexity, coherence, disturbance, stewardship, imageability, visual scale, naturalness, historicity, and ephemera; these are supported by different theories explaining people’s experience of landscape and their landscape preferences. Moreover, the authors suggest following six useful filters to choose the right indicators to be applied at each landscape management reality to be investigated. Indeed, the indicators should be clear theoretical based, transferable, quantifiable, mappable, and, dependent on the specific project features, relevant and data availability. Thus, this framework makes it possible to identify the nature of landscape change, and thereby the impact of changes on the visual qualities of the landscape, so it can be considered a good effort to link the quantification of such perceptive (and so, qualitative) aspects that are the landscape visual characters.

Focused on the rural landscape, the Belgian Rogge et al. (2007) centered their research on the idea to use the landscape perception as an instrument to start dialogue between different groups of the countryside, and, subsequently, as a means of mediating

between these user groups in a participative process. They used twenty images representing different rural landscapes in Belgium and submitted them to three targets (the main one very involved in the rural landscape issues): farmers, landscape experts and the country-dwellers (which live in rural areas but do not gain profits from agricultural activities). The aims of the study were to uncover the meanings, functions and perceptions that the stakeholders attribute to the rural landscape, how far these elements were distant amongst the three groups and in which way is possible to use these information for attenuating the eventual conflicts in terms of landscape management generated in the different groups. In particular, they tested the degree to which the respondents consider each of the six predictors used in the study (vegetation, buildings and human constructions, openness, maintenance or tidiness, agricultural crops and variety) when expressing their landscape preference. The hypothesis was that each of the three user groups attaches importance to other predictors when judging a landscape and the results confirmed it. Indeed, the researchers found that the three groups look at landscapes in a different way, attaching importance to different landscape features, and finding different functions appropriate for the considered landscapes. For example, these divergences do not only depend on the different socio-economic backgrounds of the target groups, but on the content of the landscape as well. Farmers and country-dwellers (both living in the countryside) had quite similar opinions on the attractiveness of typical agricultural croplands. They did not agree, however, on the greener and enclosed landscapes. Another striking finding was that experts had a different view on the agricultural lands than both farmers and country-dwellers. This is an important conclusion considering the fact that experts (who do not live in the area) often have a large influence on the future of these landscapes. It is therefore important to be aware that experts may have a different opinion when suggesting concrete policy practices. In particular, Strumse (1996) found that this fact is often neglected and that most of the time these experts are not aware of their different views and perceptions of the landscape. This lack of understanding can obviously be a potential cause of tensions and conflicts when landscape strategy development for a region is dominated by experts. On the contrary, investigating and identifying the different rural landscape perceptions amongst stakeholders might help and prevent possible conflicts. Being aware that different user

groups of the countryside look at the landscape in a different way, appreciating different aspects and expecting different functions means that policies and actions of rural management, multifunctional agriculture, landscape and open air recreation should assume the necessary communication about quality among different stakeholders. Therefore, this kind of research has got a great potentiality in improving the management of rural landscape by offering a stratified knowledge to take into account in the implementation of the policies.

3.3.3 Linking the perception with Ecosystem Services assessment of landscape

In the previous case studies, the landscape perception has always been investigated without linking it at the ES assessment. Instead, here the step forward is to report few examples of how the stakeholders' perception can be captured for understanding their visions regarding the ES found in the landscape they live. Moreover, this framework also traces the direction of the next chapter of this thesis, where a field research regarding these issues conducted by a group of researchers of the University of Molise and the writer will be entirely reported.

It needs to say that currently there is not a robust chunk of studies regarding the ES perception aimed at the landscape management, but in the last years the socio cultural valuation approaches specifically for exploring the human attitudes and perceptions regarding the ES are increasing (Martin-López et al. 2012).

Starting from the awareness that the demand for ES (i.e. the needs of beneficiaries) or understanding of the concept and the relative ranking of different ES by beneficiaries has received limited attention, Lamarque et al. (2011) carried out a research for investigating how different stakeholders identify the ES of grassland (which ES for whom) in three rural study areas in Europe (England, France and Austria), and in which way their perceptions could be related to agricultural activities. More specifically, the authors used interviews with regional experts and local farmers of mountain grasslands to explore the perception of ES and the relative importance of different services for different stakeholders of the three European mountain semi-natural grassland regions; then, in

order to build a systemic view, they investigated how these perceptions are influenced by stakeholders' knowledge on biodiversity and soil fertility (these are the two ES explored) and by their direct involvement in management. The research purpose was important also to understand how the stakeholders involved perceive the rural landscape in terms of the current functional shifting, from a productive agriculture to a multifunctional source of services, as the CAP is pushing its financing policies.

Looking at the results of this research, aimed more at analyzing in-depth stakeholders' discourses rather than obtain a representative overview of perceptions, it emerges that there are differences between farmers' perceptions of ES across regions, and within regions, between knowledge of ES gained by regional experts through education and farmers' local field-based knowledge. Thus, these results are in line with what was found in the researches shown in the previous paragraph regarding the perception divergence amongst categories of stakeholders. Moreover, according to the authors, differences in perceptions highlighted in this study show that practitioners, policy makers and researchers should be more explicit in their uses of the ES concept in order to be correctly understood and to foster improved communication among stakeholders.

Furthermore, this study showed that it is essential for effective policy implementation and research to have a good understanding of stakeholders' perceptions of ES, which are themselves linked to their attitudes towards biodiversity management. The results suggest that achieving sustainable management of grasslands ES and better acceptance of biodiversity conservation strategies requires: more precise descriptions of which ES are considered; improved knowledge of differences in interest and importance of services amongst stakeholders. In addition, it was found that stakeholders' knowledge of biodiversity and soil fertility influences their perception of agricultural management effects on ES and while stakeholders are aware of the effect of agriculture on ES supply, their knowledge on relationships between ES are not sufficient and need to be strengthened. In this sense, the ES assessment aimed at the landscape management needs to develop a learning process for all the stakeholders involved.

In the end, results support the necessity for additional research on demand for and supply of ES, rather than focusing on supply alone, as, instead, Termorshuizen and Opdam (2009) did. This could help scientists to respond to stakeholders' priorities, but stakeholders' points of view are also needed to translate ecosystem functions into ES.

On these themes, even an Italian Life+ project is focusing the attention. It is called "Farenait³⁹" and its objective is to offer to farmers and administrators a framework of opportunities connected to the Natura 2000 Network. To do that, the project partners have built a network of collaborations and synergies at national and international level with all the stakeholders that are involved in reinforcing the role of farmers, and the farmers themselves, to make them aware of the responsibility they have for the conservation of biodiversity in Natura 2000 sites. Economic incentives are used for involving farmers in an active management of these areas.

In the recent years, an interesting ferment concerning the researches about the ES assessment by including the landscape perception has been growing in Spain. In particular, these studies relate with landscapes that have been shaped by long-term human impacts, namely, the so-called "cultural landscapes" (Martín-López et al. 2012), and the Mediterranean cultural landscapes suit well to this kind of researches. Indeed, these landscapes have developed as a result of the close coevolution of human societies and biophysical systems (Blondel 2006). In such landscapes, high degrees of biodiversity (Myers et al. 2000) and resilience (Cabell and Oelofse 2012) are particularly linked to cultural values and to social behaviors and perceptions. Within cultural landscapes, agroecosystems have been recognized as important providers of ES (Swinton et al. 2007; Zhang et al. 2007; Power 2010; Lamarque et al. 2011a; Nieto-Romero et al., 2014). Increasing calls for sustainable agriculture are also drawing attention to the social-ecological nature of agroecosystems and to the idea that agriculture produces landscapes that are at once social, cultural, and ecological (Bacon et al. 2012).

³⁹ <http://www.lamiaterravale.it/it> [Last consultation: 02-28-2015].

This context, adaptable to some Italian regions with a prevalence of agricultural landscapes, has inspired works like the one of Oteros-Rozas et al. (2014), aimed at assessing, with interviews, the social perception of ES important for human well-being, the spatial and temporal locations of the delivery of ES in the transhumance landscape (ES flows) and the relation amongst the socio-demographic characteristics of respondents and their ES perception. The authors demonstrated that the socio-cultural approach to assess ES is a good methodology for investigating how traditional low-intensity agrarian landscapes, such as the transhumant social-ecological network, are responsible for the delivery of a diverse flow of ES. These outcomes, they suggest, should be adequate to attract policy interest in and institutional support for their preservation. So this is another example of how the ES assessment through the stakeholders' perception can increase the knowledge to be used (or in the hope to do that) in the planning and decision-making processes.

Again, in the transhumant landscape in Spain another research focused the attention on evaluating the social perception of ES provided by the Conquense Drove Road landscape by using visually based landscape interpretation (López-Santiago et al. 2014). The researchers used face-to-face questionnaires with a sample of local inhabitants, visitors and urban inhabitants for investigating 16 ES, belonging to the three types: provisioning, regulating and cultural ES. In the questionnaires, there were two pairs of photographs depicting croplands and pine forests associated with the transhumance landscape, with one photograph in each pair containing a drove road.

According to the results, people generally perceive forests as providing a wider range of ES than croplands. In contrast, both cultural and regulating services were strongly perceived in both landscapes, even more than provisioning services. Moreover, landscapes with a drove road were considered by respondents as being providers of more ES than landscapes without a drove road. In this sense, this was the first study to report that the importance of drove roads is effectively recognized by a diverse sample of the population, both locals and visitors, and that the drove road is a distinct visual landscape element responsible for the delivery of a diverse number of ES. Furthermore, the social appreciation of the supply of ES in cultural landscapes was clearly associated with certain

characteristics of the respondents, ascribable to the concepts of sense of place and cultural preferences: the rootedness and identification with the place, environmental knowledge, recreational needs, and economic dependence on the place.

By evaluating the methodologies applied in this study, the use of visual stimuli in particular has proven to be a useful technique for elucidating social-ecological perceptions, using the landscape as a friendly communication channel and the ES framework as a code easily understood by stakeholders. Therefore, this approach resulted ideal for investigating the human-ecosystem interface.

Declining these results in terms of decision-making processes, they let understand how the cultural landscapes, such as the drove roads, are important for people, because they made a link between the Mediterranean ecosystems and their society, giving values and preferences that go beyond any monetary estimations. Therefore, these values need to be incorporated into planning processes. This consideration let emerge the necessity to develop alternative methods to the financial-economic ones, or at least to integrate them, for taking into account people's perceptions of ES, particularly in cultural landscapes. As it has seen in this thesis, some existing socio-cultural valuation approaches have proven useful for acknowledging the diversity of values emerging from the ES spectrum and for providing information about the relationship between human well-being and ecological changes (Chan et al. 2012b).

In conclusion, the case studies here described are examples that demonstrate how it is possible to improve the rural landscape planning by making a wide range of ES delivered by landscapes visible, providing information about people's perceptions of the delivery of ES, uncovering the socio-cultural factors that determine the social appreciation and preferences of such ES, and, in some cases, drawing attention to the consequences of changes in land use in terms of ES trade-offs. All these knowledges, then, need to be shared and discussed amongst all the stakeholders involved in the rural landscape management.

3.4 A "twofold approach" for the landscape management: from the lessons learned to a proposal

Contents
<ul style="list-style-type: none"> • The case studies presented in the chapters two and three related to the landscape management here are synthesized in terms of typologies of subjective and objective data of which they related with • A "twofold approach" is presented for guiding a more effective planning and management of the landscape

In the light of the concepts expressed in the chapters two and three, and taking into consideration the several case studies brought in evidence, this paragraph aims to synthesize the lessons learned from the other research experiences and to give guidelines for exploring a "twofold approach" here proposed to improve the processes of the landscape management in terms of quality and effectiveness.

Looking at the Table 5, it notes that every case study deals with both objective and subjective data, even with the respective differences in terms of contents.

Table 5 – The main subjective and objective data investigated in the case studies here considered as good examples of landscape management.

Case study	Subjective data from landscape	Objective data from landscape
Village Design Statement	Aesthetic appreciation, sense of place, community values	Rural landscape characters ⁴⁰
Landscape Character Assessment	People's perceptions in terms of sights, memories, needs and community values	Landscape characters
Landscape Observatory of Catalonia	People's perception, sense of identity, symbolic values	Landscape characters, transformations, diversity, fragmentation, economic value, regulatory system, etc.

⁴⁰ In this table, landscape character refers to the LCA definition: "Landscape character is a distinct and recognizable pattern of elements that occur consistently in a particular type of landscape. Particular combinations of geology, landform, soils, vegetation, land use, field patterns and human settlement create character" (Swanwick 2002: 9).

Scales for Perception and Evaluation of Landscape (SPEL) + Agenda Landschap	Physical perception, sensory experience, aesthetic appreciation	Land use, land management, naturalness, historical character, regulatory system, socio-demographic, economic value
HeriQ	Sense of place, educational needs at sustainability	Landscape characters, socio-demographic, quality standards for heritage interpretation, natural and cultural heritage
Landscape Plan of Tuscany Region	Ex post stakeholders' opinion about the actions and objectives of the landscape plan	Landscape characters
Regional Landscape and Territorial Plan of Puglia	Stakeholders' opinions and proposals, sense of identity, community values	Landscape characters, socio-demographic
Piedmont Network of Landscape Observatories	Sense of place, sense of awareness, stakeholders' perceptions and expectations, aesthetic appreciation	Landscape characters,
Delta del Po Landscape Observatory	Educational needs, people's opinions about the landscape transformation	Ecological network, biodiversity
National Observatory of the rural landscape	Cultural values of rural landscape, significance	Rural landscape characters, transformations, integrity, vulnerability
European Landscape Observatory	Valorization objectives, aesthetic appreciation	Objectives reached in national and international programs regarding the landscape conservation and valorization
PLACE Program	Sense of place, sense of identity, sense of awareness, community values, educational needs	Landscape characters, cultural heritage, socio-demographic
ECOS Project	Stakeholders' opinion about their needs and perspectives	Ecological systems, socio-demographic, economic values, built environment
Council on the Future of Vermont	Stakeholders' perception and needs, community values, sense of place	Socio-demographic, economic values
Life MGN	Stakeholders' opinion about the importance of ES of their own landscape	Management aspects of Natura 2000 sites, cost of management actions, landscape characters, socio-demographic, economic values, ES availability
Kohasa and Handoh 2006	Stakeholders' visual perception	Close-to-nature forestry practices
Ode et al. 2008	Stakeholders' visual	Landscape characters, visual

	perception, imageability	concepts: complexity, coherence, disturbance, stewardship, naturalness, historicity, visual scale, ephemera
Rogge et al. 2007	Stakeholders' perception of rural landscape	Vegetation, buildings and human constructions, openness, maintenance, agricultural crops, variety
Lamarque et al. 2011	Stakeholder's perception of grassland ES, attribution of importance to ES	Mountain-grassland ecosystems, biodiversity, soil system
Oteros-Rozas et al. 2014	Stakeholders' perception of ES along the drove road landscape	Landscape characters, socio-demographic, ES availability, ES flows
López-Santiago et al. 2014	Stakeholders' perception of ES along the drove road landscape	Ecological systems of pine forests and croplands, ES availability

Amongst all the subjective data included, it appears that the Italian cases, in particular, do not consider very much the care of the sense of place perceived by people (an exception is the Piedmont Network of Landscape Observatories), mostly because they are about landscape plans, which are instruments not completely adequate for investigating this kind of data in the current Italian framework. On the contrary, the Italian cases consider people's opinion in general; however, it happens mostly in the end of the planning process, with the aim of creating a consensus about what has been already decided, rather to build a participatory path since the beginning. Moreover, it is interesting to notice that many case studies include the investigation of people's perception regarding different features of the landscape. This demonstrates the awareness reached in the years by both the social and ecological sciences to consider the centrality of the human perception in the landscape as starting point to implement researches and decision-making processes that can have a positive impact on the territory.

Considering the objective data of the case studies, it emerges a constant presence of the landscape characters investigation, because the management of a landscape always starts from understanding its biophysical features, and, then, also the socio-economic aspects that can influence the shape and the functions of that landscape.

Furthermore, only the last cases deal with the ES assessment for improving the knowledge about the people's perception of the landscape and its functionality. This kind of approach should be developed better in the future, because it is able to integrate the ecological, economic and socio-cultural domains retraceable in a certain landscape. Swinton et al. (2007) assert that understanding how humans perceive and value ES is as fundamental to ecosystem management as understanding how ecological functions generate these services. Moreover, just because many case studies consider the landscape character as a subjective data set from which starting the respective elaborations, it is possible to imagine that the ES approach is feasible to be applied to those cases, properly by considering as a reference scheme the source, the flows and the beneficiaries of the services that a landscape is able to provide.

Taking into account the lessons learned from all the case studies mentioned in the thesis, a "twofold approach" is proposed and here explained in general terms; in addition, this approach needs to be considered applicable with a high flexibility in any process concerning the landscape management. For "twofold approach" is meant a line of action that consider the integration of the objective and the subjective data concerning the assessment of the landscape as a whole (Figure 4). For the objective data (for example, the biophysical, economic, socio-demographic data, as it is shown above) the approach proposes to use indicators derived from the ES assessment approach (in reference of paragraph 3.2), which means considering, again, a certain landscape in terms of source, flows and beneficiaries of services. For the subjective data, such as people's perceptions, values, needs, cultural expressions, it proposes to use indicators proper of the social sciences that are applicable in the wide range of participatory methodologies (in reference of chapter 2). In the scheme some example of outputs derived by processing the objective and subjective data set are shown: the source of inspiration of some of these examples is the study area that will be deepened in the next chapter; in particular, for the subjective data, the applicative case will focus on the ES perception. Then, all the outputs reached can contribute to implement the landscape management. It has to specify that both the paths of the twofold approach include the active participation of experts and local stakeholders that need to interact each other's and along the entire planning process. Moreover, the objective and subjective branches are not to be

considered parallel, rather in constant interaction all along the planning process thanks to the interrelations of all the people involved. Indeed, on purpose, the word “people” lacks in the entire graph, because it is implied and it needs to consider both the obvious sense of the planning meaning (it is a process made by people) and the presence of working groups in every box of the graph.

Therefore, integrating the landscape values (expressed with the stakeholders’ participation methodologies) with the concept of natural capital and ES (Costanza et al. 1997; Daily 1997; de Groot et al. 2002; Millennium Ecosystem Assessment 2005) may provide a potential framework for enabling the detailed understanding of the broad range of values (called community values) that can shape planning for targeted the conservation and management of the landscape (Raymond et al. 2009).

In the end, what the “twofold approach” wants to remark is that only with an integrated, systematic and multidisciplinary approach that can link the objective and subjective phenomena of the landscape is possible to carry out an effective and shared management.

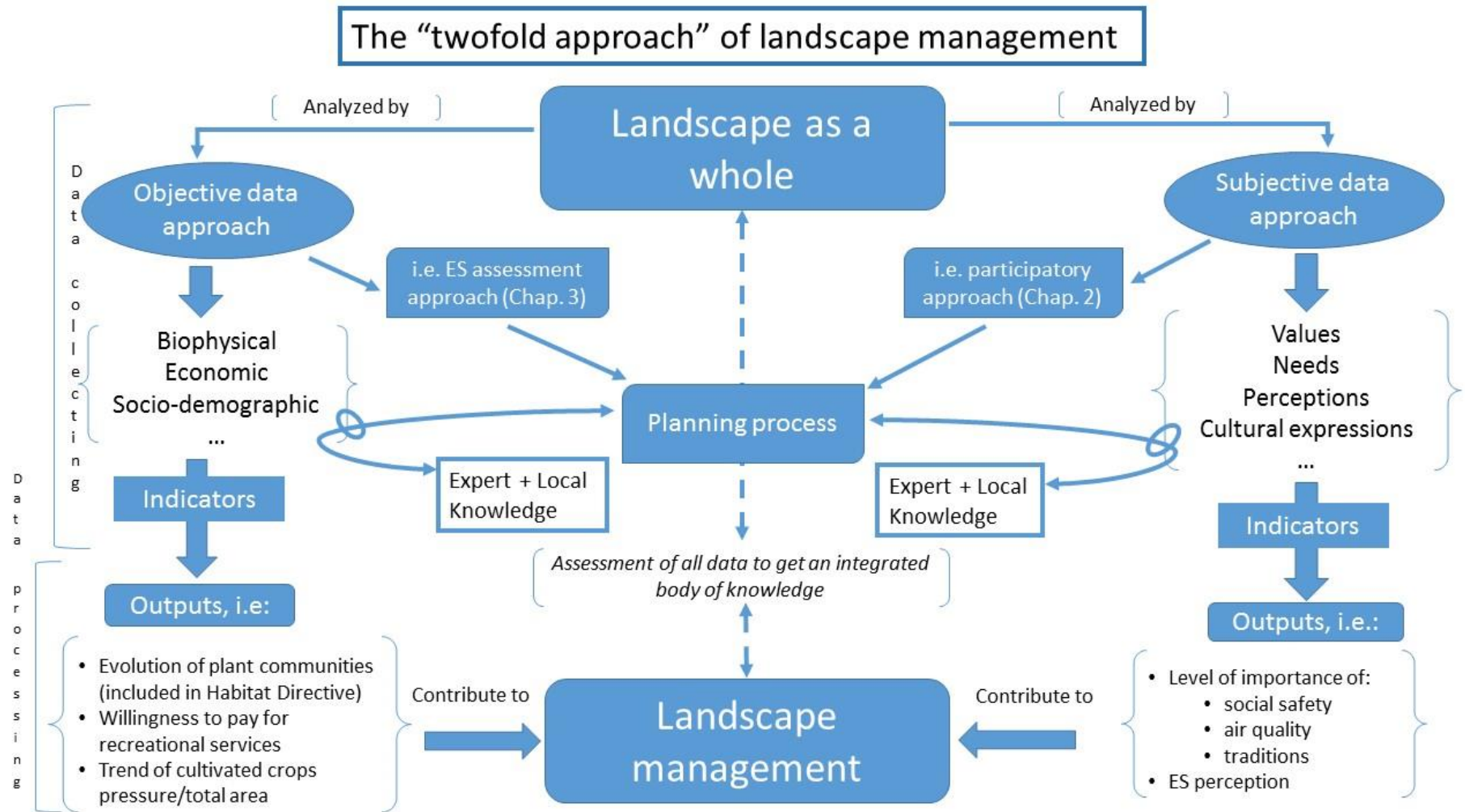


Figure 4 – Representation of the “twofold approach” of the landscape management.

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GREEN ECONOMY INITIATIVE – UNEP

<http://www.unep.org/greeneconomy/>

LIFE+ PROJECT “MAKING GOOD NATURA”

<http://www.lifemgn-serviziecosistemici.eu>

LIFE+ PROJECT “FARENAIT”

<http://www.lamiaterravale.it/it>

SOCIAL VALUES FOR ECOSYSTEM SERVICES (SoIVES)

<http://solves.cr.usgs.gov/>

CHAPTER FOUR

An applicative case in the Biosphere Reserve in Molise Region (Italy)



Minotti M. – “*Monte Pizzi nibbled*” (2014).

4. An applicative case in the Biosphere Reserve in Molise Region (Italy)

In the previous chapter, the headlines of the twofold approach aimed at the landscape management by linking the ES assessment approach with the community engagement methodologies have been delineated. Hence, the purpose of this chapter is to show the application of the approach by considering, for the objective data, previous studies and researches already acquired for the study area, and, for the subjective data, a participative method that should be defined “indirect” in a management prospective. Indeed, it refers to a field study where local people were interviewed and, then, this local knowledge will need to be added to the expert one (as the twofold approach recommends) for implementing the landscape management of that area in a future perspective. What is going to be described here wants to be a first attempt of putting in practice a set of theoretical good suggestions (mostly taken by the case studies and methodologies analyzed previously, which, on turn, have motivated the elaboration of the twofold approach) for exploring their feasibility on the rural landscape for improving its management.

4.1 An introduction to the application of the twofold approach

Contents:

- An overview of rural landscape of Molise Region is given
- The BR in Alto Molise: the reasons of choosing this area for the applicative case
- The establishment of the Collemeluccio-Montedimezzo Alto Molise BR can be considered an important occasion for local people to take care of their own landscape and implement the sustainable development
- The objective data regarding the BR in Molise are illustrated by listing the main issues dealt with by researches and studies carried out along the years
- The respect of the three main functions of the UNESCO Man and Biosphere Program are explored in the case of Collemeluccio-Montedimezzo Alto Molise BR
- A special attention is given to the interrelation between biodiversity and ES, underlined by UNESCO-ICC, and further researches in this direction need to be

carried out in the BR by integrating expert and local knowledge

The Molise Region is dominated by mountainous landscape (80% of the total surface) and from the internal area the elevation slopes gently down to the short coast on Adriatic Sea with rich hilly landscape (De Agostini 2006). Molise is a transition region for the physical characteristics of the landscape, from the Abruzzo Apennine to the flat territory of Northern Puglia. This transitory aspect is also found in the mobility of people, especially for touristic reasons (still a niche phenomenon in the Region), from North to South or *vice versa* that today makes to define Molise as a “Region of passage” (Centro Studi sui Sistemi Turistici 2006).

The rural vocation of the Region makes the agriculture the main economic sector of Molise (the agrarian and forestry surfaces represent 92% of total), even if its trend is still decreasing in the last decades (De Agostini 2006). In particular, it is possible to recognize medium-small farms in the internal and more mountainous areas (High and Central Molise) with a prevalence of cereal and forage crops and a scarce diffusion of tree crops like grapes and olives, and medium farms in the lower hilly and coastal areas (Low Molise), where the cereal and forage crops are more integrated with grapes and olive crops. Just because of the small dimensions, the most of Molise farms are oriented to the self-consumption with low income. While today half of the regional territory is utilized for agriculture, less than a quarter is designed to pasture (Ibidem). This reveals the big loss of the other main economic driver of the Region, which was the sheep farming, especially the transhumance. Indeed, all the Molise landscape is crossed by a dense network of cattle tracks of different sizes (the main and largest ones measured 111 m wide) for driving the herds from the summer pastures of Abruzzo Apennine to the winter pastures of flat Northern Puglia. This practice lasted for centuries until around 60 years ago (Paone 2006). Because the transhumance is not practiced anymore in Molise, the drove roads landscape, huge herbal tracks, is the most endangered one in the Region, mostly reconquered by the natural ecological succession or occupied by the agricultural crops or even artificial surfaces.

In terms of landscape management at regional level, it needs also to underline that Molise is not totally covered by the landscape planning, which is, in addition, old and not effective (Cialdea 1996).

In this general context of the rural landscape of Molise, the attention has been focused on the specific area of the Collemeluccio-Montedimezzo Alto Molise Biosphere Reserve for different reasons consistent with the purposes of this thesis work. Indeed, the Biosphere Reserve (BR) encloses many fragilities and potentialities of the rural landscape (underlined in the chapter 1 in more general terms), such as the abandonment of the agriculture, the expansion of the forests, the low income from agriculture and the depopulation of residents, the well-preserved cultural traditions connected with the agriculture and pastoral practices, the attractiveness of the peaceful and varied landscape, the opportunity to connect the biodiversity conservation of species and habitats with the ecotourism and the sustainable development of local communities. Moreover, the BR is a privileged study area for implementing a new model of landscape management (in general, it lacks in the Region, as it has been said above, and a new regional landscape planning is urgent), based on the community engagement, because a BR is established where a balanced relationship between people and nature is demonstrated to exist (UNESCO 1996). In addition, the area has been subject to many researches and studies, especially in the field of the environmental sciences, mostly conducted by University of Molise since many years. All these reasons make the BR a fertile field where develop, experiment and implement a new landscape management approach in the future.

In terms of the applicative case, the rural landscape of the Collemeluccio-Montedimezzo Alto Molise Biosphere Reserve⁴¹ is sited in Central Southern of Apennine, a hilly-mountainous area 25,268 ha wide with a mixed landscape matrix: extensive deciduous and coniferous woods constitute the main component, interspersed with grasslands, scrublands (AA.VV. 2014). Seven small villages are the urban fabric and little

⁴¹ <http://www.riservamabaltomolise.it/> [Last consultation: 02-28-2015].

extended farmlands talk about a territory that has been always lived thanks to a strong and balanced coexistence between humans and nature. On June 2014, this area officially became a BR after a multiple-years preparing process made by studies and researches carried on by the University of Molise, agreements amongst local administrators (even a public consortium was created on purpose), meetings and events organized for the local communities. All these steps were made to give the opportunity to this territory for improving its socio-economic development thanks to the advantages brought by the UNESCO Man and Biosphere (MAB) program. The importance of letting grow this territorial consensus and agreement gets a higher value if considering that since the 1977 the Collemeluccio-Montedimezzo BR has been already existed, and it was one of the first established in Italy since the UNESCO MAB program started in 1971. Therefore, the important goal obtained in June 2014 was the acceptance by UNESCO International Coordinating Council (ICC) of the enlargement requested for the BR: from two separated nuclei of woods wide 637 ha in total and with no people living within, it turned into more than 25,000 ha with an interesting landscape heritage “care taken” by around 5,000 inhabitants.

The BR enlargement was a good result and it should mean that the familiarity with this brand has been acquired by then for local people, but unfortunately, it is not true. Indeed, that was demonstrated during the participatory process with the local stakeholders carried out in August 2013 with the aim of both increasing the diffusion of the BR enlargement project, and the occasion to exchange opinions with people and getting from them new ideas and stimuli to improve the BR management plan (in a drawing up phase at that time). In those events, stakeholders were poorly aware about the meanings of living in and belonging to a territory that was turning into a Reserve with no restrictions and more advantages. The participation was scarce and even if the stakeholders involved demonstrated to appreciate very much those exchanging moments, they also showed to have not understood completely the potentialities to get benefits from a “UNESCO brand”. Those results from the participatory process have to be interpreted in the sense that there is still a long way to walk to sensitize and educate people for making them aware and understandable of the real material and immaterial values of their landscape resources. And where this consciousness is present, such as for

the historical nuclei of Collemeluccio and Montedimezzo forests or the archeological site of Pietrabbondante, there is need to work with local communities to turn this awareness into concrete actions of valorization and sustainable development, in coherence with the objectives of UNESCO MAB Program.

As a consequence, more efforts are needed to involve people to participate actively at the management of their landscape. In this sense, the research presented in the following paragraph takes the direction of better investigating how local communities perceive the resources that surround them with the ES assessment approach.

For what concerns the applicability of the twofold approach, first it needs to consider that the BR is a reality “partially planned” in reference of the data and documentations delivered to UNESCO for the nomination. Amongst these documents, for example, there is the zonation of the BR (shown on map in the next paragraph: Figure 5) and the management plan guidelines, which are only an address and have purposeful character. Indeed, there is not a management plan of the BR yet, which needs to be draw up in the next future. Thus, in this context, by analyzing the set of data already available for the study area, the objective data need to be consider already acquired and deeply explored by experts and researchers and they are listed and described shortly below. Moreover, a synthesis of the objective data are collected in the extension form document of the BR enlargement project (AA.VV. 2014) delivered to UNESCO in December 2013 (and evaluated by UNESCO-ICC with a positive outcome in June 2014, as it has been said above). Instead, a lack of subjective data regarding the BR landscape has been noticed. From this observation, it has been decided to focus the attention right on this missing piece of the twofold approach, in particular by investigating the ES perception of people who live and enjoy the BR landscape. The aim was to acquire the local knowledge, which has a strong place-based character, to be added to the expert knowledge for drawing up more integrative and systematic guidelines for implementing the BR landscape management.

As anticipated, here a set of objective data typologies referred to the BR landscape is illustrated; instead, in the following paragraph the subjective data expressed by the ES perception of BR’s stakeholders are deepened through a peer review article that is still in

preparation. By linking these two branches, a more integrated and multidisciplinary way of managing the BR should be achieved in the future.

In terms of objective data, the Collemeluccio-Montedimezzo Alto Molise BR is covered by several studies and researches that have been carrying out since many years. The main issues investigated are the biophysical characteristics, such as the altitude, climate, geology, geomorphology and soil, and the biological characteristics, such the vegetation and the fauna. More in a network key, the ecosystems and the land cover types of the BR landscape has been deeply described and localized. Moreover, some recent studies relate with the socio-demographic data about the population, the agriculture and livestock activities and the tourism characteristics (AA.VV. 2014).

According to the UNESCO criteria for establishing a BR (UNESCO 1996), the three main functions to be carried out are: in situ conservation of natural and semi-natural ecosystems and landscapes (conservation function); demonstration of ecologically and socio-culturally sustainable use (development function), and logistic support for research, monitoring, education, training, and information exchange (logistic and support function). These different roles are realized thanks to a zonation system of the landscape that includes one or more core areas, buffer zones, and transition areas (Schliep and Stoll-Kleemann 2010).

In the case of the BR in Molise, the conservation function regards mostly the evolution of the habitats (especially the forests, grasslands and shrublands) and the fauna present there.

The development function in the BR is translatable in a future perspective, because it aims to create an efficient model of sustainable development that will promote the integration between the economic activities and the needs of natural resource and biodiversity conservation. Some examples regarding the BR landscape are the enhancement of the traditional practices of forestry, agriculture and animal husbandry to be reached through the recovery of traditional forestry activities, the characterization of local crop ecotypes and their conservation in situ and ex situ. Another field of

intervention is the enhancement of the cultural landscape and the routes of transhumance (cattle tracks), that are often still visible in the rural landscape, with the intention to re-introduce and preserve forest-pastoral activities no longer in use for educational purposes. Moreover, it will be possible to implement economic activities and sustainable development from a socio-cultural and ecological points of view through the dairy production (local milk processing), the development of agri-livestock systems, the collection of truffles and their processing, the activities of agri-tourism and Bed & Breakfasts, the sustainable forest management, handcrafted products, etc. The ecotourism is also a privileged sector to be improved, considering that at today there are some “touristic hotspots” in the BR that attract almost the total of tourists: Montedimezzo forest (it comprehends a visitor center, a naturalistic museum, many hiking and biking trails, wildlife areas and an outdoor recreational area) that registers an average of visitors’ presence of 22,936 from 2008 to 2012, and the archeological site in Pietrabbondante (dating from the second century. B.C. and connected with the pre-Roman civilization of Sanniti people) that counts an average of 10,602 visitors in the same period of time (AA.VV. 2014). The BR will also play an important role as for dissemination projects, environmental education, research and monitoring at local, regional, national and international level.

In connection with this last point, the logistic and support function is carrying out in the BR by focusing on abiotic-themed researches (such as about the pollutant monitoring) and biotic-themed researches (especially concerning the biodiversity, forests, threatened species and habitats, climate, etc.). Furthermore, the socio-economic researches are also valorized, like one about the conservation of the cultural landscape of transhumance in the area.

By declining the objective data here described for the BR landscape into the twofold approach, a note needs to be said: what it lacked and is still quite lacking is the connection between the expert and local knowledge in the data collecting and processing. It is true that for some kinds of research, the community engagement is more contemplated and feasible (such as the socioeconomic-themed ones), but more efforts should be carried out for integrating the knowledges coming from different stakeholders

in the next scientific and planning works regarding the BR landscape. This recommendation should be respected not only because today the involvement of different stakeholders is a common practice or a “duty”, but mostly for improving the quality of knowledge to be acquired and to realize projects that bring a positive outcome for the local community.

In one of the last ICC sessions of MAB Program, UNESCO (2014) gave recommendations to the Biosphere Reserves that constitute the World Network of Biosphere Reserves for applying the Man and Biosphere strategy for 2014-2021. Many of these recommendations fit well with the Collemeluccio-Montedimezzo Alto Molise BR objectives and landscape characteristics; indeed, UNESCO strongly encourages the efforts in an equitable and sustainable development, the climate change mitigation and adaptation, the promotion of the sustainable use and management of water and natural resources, the development and management of the BR as model, learning and demonstration sites, the promotion of education, training and capacity building, the contribution to the research. Most of all, there is one recommendation particularly remarked, which is the conservation, restoration and the sustainable use of biodiversity and ES, because the link between these two issues is strong and undeniable (as it has been underlined even in the paragraph 3.2 of this thesis). On this particular aspect, in the Molise BR all the biodiversity of the area provides ES for their aesthetic value (e.g. vegetation mosaic, landscape diversity), while the rare, endemic or protected animal and plant species are involved in the provision of environmental education and ecotourism. Edible plant species for human and animals are implied in the provision of food. Forest species are connected with the regulating of climate, natural hazard and water quality and in the provision of biomass (fuel). As it is possible to see, all these data concerning the ES identified in the BR landscape belong to the objective branch, for saying it according to the twofold approach. Instead, there are poor data about the values, the perceptions, the expectations of local communities about the landscape ecosystems, which deliver to them certain benefits. Right because in the extension form document approved for the Collemeluccio-Montedimezzo Alto Molise BR enlargement (AA. VV. 2014) is declared that further information and studies need to increase the knowledge body of the ES framework of the BR landscape, the research presented in the next

paragraph intends to go towards this direction, for covering the lacking point regarding the subjective data of this study area.

4.2 Assessing and mapping ecosystem services perception to support participatory planning and conservation priorities at landscape scale: the case of Collemeluccio-Montedimezzo Alto Molise Man and Biosphere Reserve in Central Italy⁴²

Contents:

- The importance of assessing the ES perception of local community to better manage a BR landscape is discussed
- The Collemeluccio-Montedimezzo Alto Molise BR is presented and the methodologies for assessing the ES perception from stakeholders of the study area is described
- The results focuses on the ES perception values attributed to different CICES classes of ES and to different Corine Land Cover classes; furthermore, a calculation about the distance of perception is shown
- The discussion of the results is driven by the potentiality of using the knowledge of ES perception of the BR's stakeholders to plan the valorization of the cultural and rural landscape, in a future prospective of improvement both the production and recreational functions

4.2.1 Introduction

The role of ecosystem services perception in landscape planning

The assessment of ecosystem services (ES) is crucial to describe how humans are linked to, and depend on, nature (Haines-Young and Potschin 2013). In general, the ES assessment relies on biophysical, economic and socio-cultural dimensions (EU MAES 2013). Assessing ES primarily aims at supporting policy-making processes and public decisions, market information and academic purposes through the scientific research

⁴² Paper review in prep.: Tavone A., Minotti M., Vizzarri M., Giancola C., Di Marzio P., Di Martino P., Marino D., Marchetti M., 2015.

(Orenstein and Groner 2014). All the aspects supporting the ES evaluation have to be conducted at different spatial scales (Oteros-Rozas et al. 2014). The ES assessment can be considered as a systematic process, which is able to provide support for decision-making procedures at different scales (Hein et al. 2006), through linking nature benefits and sustainable development (e.g. Potschin et al. 2013). and adopting place-based perspectives (see e.g. Edge and McAllister 2009; Parrott et al. 2012; Potschin and Haines-Young 2013; Kopperoinen et al. 2014; Orenstein and Groner 2014). On the other hand, assessing ES should incorporate socio-cultural information able to identify relevant services for different users and potential social conflicts due to different needs and perceptions (García-Llorente et al. 2011a; Martín-López et al., 2012). Accordingly, this concerns the representation of what local people perceive as benefit from natural resources within the landscape they shape (Edge and McAllister 2009; Onaindia et al. 2013). To underline the importance of geographically specific landscapes in the eyes of local residents, Brown (2013) suggests introducing into the lexicon “landscape services” as a complementary, yet unique, concept alongside that of ES.

The framework of landscape services (De Groot et al. 2010) serves as a basis to communicate values and benefits to scientists, stakeholders, policy makers and the public (Iverson et al. 2014). Considering that people generally have the perception of the benefits arising from ES, and not of the services themselves (Sagie et al. 2013), it is important to distinguish ‘services’ from ‘benefits’ (see e.g. Mace et al. 2012). Indeed, Orenstein and Groner (2014) argued that it is not possible to assess the benefits of ES without a clear understanding of who are the beneficiaries and how they perceive certain services delivered. Although current approaches are lacking to include the ES perception within landscape management strategies (Palacios-Agundez et al. 2014), there is an increasing recognition of the importance of human perception, because whenever people get in touch with the landscape, they respond with their minds through reflection, feeling and imagination (Tress and Tress 2001). Especially at landscape scale, effective approaches for managing ecosystems while improving the ES delivering have to incorporate local population expectations with the main purpose of empower local communities in improving local wellbeing and economic development (Szaro et al. 1998; Olsson et al. 2004; MA 2005; Aretano et al. 2013). The need for including people

perceptions of ES is also outlined by several commitments currently available from global to national scale (see e.g. Maes et al. 2013; UK-NEA 2011; CBD 2004).

Actually, socio-cultural components such as people's needs, insights and preferences, are still missing or even poorly investigated (see e.g. Menzel, Teng 2009; Bryan et al. 2010; Chan et al. 2012; Iniesta-Arandia 2014; Orenstein, Groner 2014). According to the landscape⁴³ characteristics (Council of Europe, 2000), understanding how people perceive the ES provision can give insights to the interplay of the innate linkages between human and their environment (Abram et al. 2013), which express people's values and needs (Menzel, Teng 2009; Lamarque et al. 2011). Therefore, identifying and describing the socio-cultural factors that determine social appreciation and preferences for the delivery of ES is extremely important to support landscape management (López-Santiago 2014). This depends upon the consciousness that ecosystems and societies are interdependent, forming social–ecological systems that are complex, adaptive, and nested across scales (e.g., Berkes and Folke, 1998; Holling, 2001).

In this perspective, the evaluation of ecosystem potential to deliver services is considered an important binding element between research and landscape management due to its ability to express landscape trade-offs for human well-being (Helfenstein et al. 2014). Consistently, ES provide a common language to different stakeholders and can facilitate comparisons between management alternatives (Granek et al. 2010; Carcamo et al. 2014) In this way, ES can serve as a framework within which to facilitate a transparent assessment of trade-offs (De Groot et al. 2010) through the use of a common set of tools. This can foster dialogue among groups with different interests and beliefs and increase the likelihood that they can design and implement management plans that are mutually acceptable (Granek et al. 2010). Indeed, Swinton et al. (2007) assert that understanding how humans perceive and value ES is as fundamental to ecosystem management as understanding how ecological functions generate these services. Exploring the diversity of values emerging from the ES spectrum is also useful for analyzing how human well-being may be affected by ecological changes (Chan et al. 2006). Coupling human and natural

⁴³ "Landscape" means an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors.

systems implies that people-oriented and conservation of ecosystems are more likely to succeed than most currently adopted top-down governance approaches (Wilshusen et al. 2002). In a management perspective, it is also needful to consider the land use and land cover changes in order to assess how landscape fragmentation and the loss of habitats significantly affect ecosystem processes and functions, and in turn alter the capacity of landscapes to provide valuable ES (Aretano et al. 2013). Indeed, understating land use changes and related implications for societal aspects over the time gives the opportunity to better orient planning decisions towards more adaptive strategies at landscape scale. This is particularly useful while implementing barriers and drivers of change in ES flow in e.g. cultural landscapes (Plieninger et al. 2013a). In this perspective, Lamarque et al. (2011) demonstrated that it is essential for effective policy implementation and research to have a good understanding of stakeholders' perceptions of ES, which are themselves linked to their attitudes towards biodiversity management.

Biosphere Reserves: living landscapes through participation

Protected Areas globally contribute to preserve biodiversity, especially functional diversity (Lamarque et al. 2011), and, as consequence, to improve the efficiency of ES delivery (Naughton-Treves et al. 2005). Among all the typologies of PA officially recognized by IUCN (Dudley, 2013), a key-role is played by the Biosphere Reserves (BRs), which belong to the UNESCO Man and Biosphere (MAB) Program (UNESCO 2014). The establishment of BRs was originally conceived to (see e.g. Stoll-Kleemann et al. 2010; Edge and McAllister 2009): (i) contribute to the conservation of cultural landscapes, ecosystems, species, and genetic variations; (ii) foster the sustainable development and the green growth; and (iii) support research and education.

Participatory conservation emphasizes the effectiveness (implementation) of UNESCO BRs (Onaindia et al. 2013), because BRs are considered learning sites (Stoll-Kleemann et al. 2010), where the collaboration between stakeholders and decision makers to address social and environmental issues (Jungmeier et al. 2011) is enhanced. These reserves represent the interdependence of society and nature in a socio-ecological system, understood as a complex network of interacting components (Parrot et al. 2012),

so their governance systems can offer a useful approach for guiding municipalities along a more sustainable path (Edge, McAllister 2009). This action way comes from far, when the Seville Strategy, adopted by MAB network in 1995, recommended the BRs to work in the direction of the reconciliation of economic development, social development and the conservation of biodiversity, by means alliances between the local populations and natural environments (Beuret 2008). Furthermore, the Seville Strategy stated that BRs should endeavor to “survey the interests of the various stakeholders and fully involve them in planning and decision making regarding the management and use of the reserve” (UNESCO 1996). Consistently, one of the objective of the goal “Utilize biosphere reserves as model of land management and of approaches to sustainable development” is to secure the support and the involvement of local people, and the consequential recommendation at the individual reserve level is to survey the interests of various stakeholders and fully involve them in planning and decision making regarding the management and use of the reserve (UNESCO 1996; Stoll-Kleemann et al. 2010; Onaindia et al. 2013).

Recently, several studies unraveled that participation in BRs governance has been poorly understood as a formal process of downward vertical transfer in Central Europe (Schliep and Stoll-Kleemann 2010). Other studies underlined the importance of implementing ES perception in BR management (e.g. Sagie et al. 2013; Stoll-Kleemann et al. 2010). In addition, Edge and McAllister (2009) and Onaindia et al. (2013) demonstrated that collaborative processes are suitable to address social and environmental issues from a system perspective in the frame of management planning at landscape scale (and in particular in BRs). Therefore, a strategic plan aiming at the governance of a BR should go towards a sustainable and dynamic balance between economic development and natural and cultural conservation (e.g. Bridgewater 2002). Moreover, the success of the management plan in a BR essentially depends on its ability to enhance the involvement of several stakeholders (decision makers, residents, NGOs) with the aim to preserve the area and to implement actions finalized at the sustainable development (Coetzer et al. 2014). In this way, the involvement of stakeholders is crucial since the beginning of the landscape conservation planning (as also reported by Reed 2008 and Carcamo et al. 2014), by which the landscape is considered an environmental, economic and socio-

cultural resource (Aretano et al. 2013). Among the purposes, the MAB program recommends to promote and support research programs that involve academic and traditional knowledge stakeholders and social organizations aimed at providing solutions to sustainability problems experienced in BRs (UNESCO 2014).

In Mediterranean area, where landscapes (and their efficiency) are largely degraded, abandoned or threatened (Agnoletti 2014), assessing ES and related trade-offs according to socio-cultural preferences is required to identify the impact of alternative management strategies on the ecosystem's capacity to deliver benefits to local communities and stakeholders. Indeed, available studies on ES perception in Mediterranean basin are mainly focused on (i) analyzing socio-cultural preferences in some Spanish ecosystems (Martín-López et al. 2012), (ii) comparing ES perceptions in cultural landscapes in Spain (López-Santiago et al. 2014), and (iii) assessing the impact of social factors on willingness to pay for environmental services according to two alternative management options (García-Llorente et al. 2011b). By a comprehensive review, Martín-López et al. (2012) also pointed out that few studies have analyzed the stakeholders' preferences toward several services, and that most studies restricted their analysis to biophysical and monetary factors (Vihervaara et al. 2010; Seppelt et al. 2011). To our knowledge, current research is lacking of information concerning the role of ES perception to support landscape management and planning, especially in those areas particularly advocated for cultural and biodiversity conservation (i.e. BRs). Particularly in Italy, the implementation of ES perception in BRs management strategies needs to be further developed in order to orient (support) decisions towards a more resilient strategy for conservation and preservation of traditional heritages in many marginal and rural areas.

Aim of the study

The aim of research is twofold: (1) to deeper understand how the assessment of ES perception can be implemented as a supporting tool to integrate the participation of local communities in decision-making and planning processes; and (2) to set up alternative guidelines towards improving the biodiversity conservation and the preservation of

cultural heritage at landscape scale. To reach these goals at first we analyzed the main outcomes from a questionnaire survey conducted in a BR in Central Italy about people's perception of several ES; then, we spatialized such information in order to understand the relationships between landscape characteristics, land uses and ES perceptions. Finally, alternative BR management guide-lines are proposed in order to implement social values of ES towards effective conservation planning.

4.2.2 The study area

The Biosphere Reserve Collemeluccio-Montedimezzo Alto Molise is a forest BR (according to the UNESCO MAB classification: www.unesco.org/mab), it is located in the Molise Region, in Central-Southern of Italy and encompasses 25,268 hectares in a sub-mountain area; the elevation ranges from 450 to 1730 meters above the sea level, the climate is temperate and the area is characterized with a various pattern of reliefs and both lacustrine and fluvial plains. The major rivers are the Sangro River, which runs in the North-Western area, the Trigno River, which borders the Collemeluccio forest (both they flow to the Adriatic Sea) and the Vandra River, with the source near the Montedimezzo forest and flowing into the Volturno River basin (Tyrrhenian Sea).

The Reserve has a predominantly matrix forest landscape with large areas formed of natural grassland and mowing lawns with morphological features typical of mountain areas (alternating hills and small fluvial-lacustrine plateaus). The human settlements are concentrated in foothills villages (exactly, seven municipalities) and the presence of occasional buildings is very limited. On January 1st 2014, 5,096 inhabitants lived in the Reserve (<http://demo.istat.it>). The main land cover types on total area are forests 65.9%, grassland 21.4%, shrublands 7.9%, agricultural area 3.5%, urban area and other settlements 0.76%.

The BR is characterized by remarkable phytocenotic diversity, mainly in a forested landscape matrix. The forests are composed by Downy Oaks (*Quercus pubescens*), typical of the Mediterranean and sub-Mediterranean zones, Turkey oaks (*Quercus cerris*) characterizing mesophilic forests, beeches (*Fagus sylvatica*) and riverine woodlands

dominated by willows (*Salix* sp.pl.). Other important ecosystems are represented by grasslands whose appearance is determined by morphological and microclimatic conditions. Mesophyle grasslands on gently sloping hills and plains, near streams or in soils with high water content and Xerophyle grasslands can be found on steep slopes characterized by detrital limestone lithology. Moreover, in the BR landscape 9 different habitats (within 7 Site of Community Interests present in whole or in part) are found and can be considered rare, or worthy of preservation for the presence of species worth protecting.

About the fauna, according to the last check-list (2012-2013), in the area there are 48 species of mammals, 112 of birds, 10 species of amphibians, 8 of reptiles, 5 species of fishes and 9 of invertebrates included in the Habitat Directive (92/43/EEC). The majority of these species depend on open environments and wooded areas, thus the maintaining of the landscape mosaic is central for them conservation.

The BR addresses these principle objectives: (i) conservation of habitat, species biodiversity and cultural landscape; (ii) conservation of tangible and intangible cultural-historical heritage; (iii) contributing to the improvement of local communities' socio-economical welfare; (iv) improvement and development of ecotourism, recreational activities, education and training.

The research in the BR is focused on forest ecosystems and management, conservation of silver fir germplasm and its resilience and adaptation to climate change, recovering and conservation of traditional ecotypes of agrarian interest, conservation of cultural landscape of transhumance. Furthermore, the monitoring is targeted at vascular flora, threatened animal and plant species, deadwood distribution and micro-habitats, natural regeneration of silver fir, natural dynamics of secondary succession forests, shrubs invasion on grassland ecosystems.

Before June 2014, year in which UNESCO officially accepted the enlargement of the BR with a new zonation (see Figure 5), the BR already existed in terms of two spatially separated forest cores (Collemeluccio and Montedimezzo, with a total surface of 637 hectares) since 1977, when it was one of the first Italian Biosphere Reserve that has been

established. The BR is managed by a Consortium, constituted by the seven municipalities included in the area, the University of Molise and the Molise Region Authority.

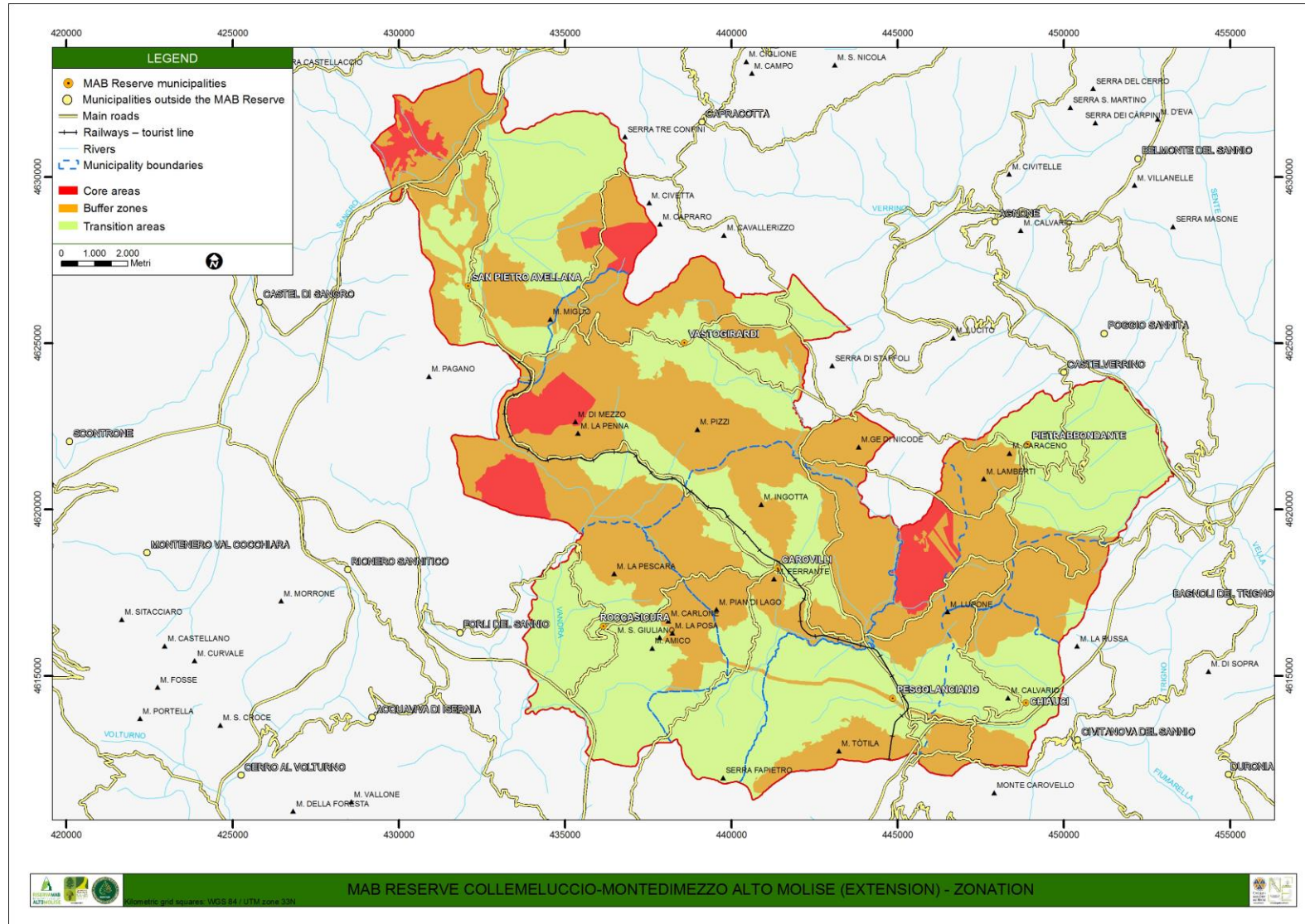


Figure 5 – The zonation of BR landscape (AA. VV. 2014).

4.2.3 Materials and methods

The methodologies adopted for this research consisted in a survey phase conducted with face-to-face interviews for capturing the thoughts and perceptions of people who live and enjoy the BR landscape. After that, the processing and assessment of data collected were finalized to map the results of people's perception values.

Survey on ecosystem services perception

The survey was formulated by analyzing the biophysical and socio-economic characteristics of the BR landscape with a group of multidisciplinary researchers (disciplines like forest science, environmental economy, cultural heritage, geomorphology, ecology, botany were covered) of University of Molise for understanding what ES could be retraceable in the study area. A focus group with those experts was held to get this purpose and the CICES classification (Haines-Young et al. 2013) was used to select the greatest number possible of ES classes (reported in Table 6) to be investigated in the survey. Many studies about the ES perception concentrate the attention of few ES, rather than on multiple interlinked services, which remain a significant gap in knowledge (Lamarque et al. 2011) Moreover, for collecting qualitative data, CICES was the base for drawing up the questionnaire (see Annex 1) and the questions were thought to be easily understood by respondents, about whom it was supposed they were unfamiliar with the ES framework, which is a quite complex concept (Plieninger et al. 2013b). For this reason, the terms ES and ecosystems were never utilized during the interviews.

Then, the number of respondents' sample was chosen by considering 1% of total inhabitants of the BR territory, namely 51 people, and similar numbers are found in other researches with the same issue (e.g. Raymond et al. 2009; Klain and Chan 2012; Van Berkel and Verburg 2012; Plieninger et al. 2013b). The survey was conducted by interviewing people in BR with the snowball sampling (Reed et al. 2009). Beyond the paper questionnaire, other facilitating tools were used, to help respondents speak about the resources of their landscape and, mostly, to make them comfortable for identifying the places where they were able to perceive the source of ES: printed pictures, a paper BR

landscape map with scale 1:25,000 with an orthophotographic land cover and tablet with GPS software. The knowledge about the participatory or community mapping (see e.g. Fagerholm and Käyhkö 2009; Plieninger et al. 2013b; García-Nieto et al. 2014) was considered for verifying if and how much stakeholders are able to identify places or objects that they have in their minds on a map, for drawing up the map of perception of ES. Furthermore, the visual stimuli are helpful in perception-based methods of landscape research (Daniel 2001) and constitute a socially shared communication channel (López-Santiago et al. 2014); thus, another aim of the focus group was to make experts choosing the best pictures taken in the BR for investigating some perceptual issues of landscape (e.g. visual impacts, homogeneity VS heterogeneity, familiar patterns of landscape, etc.). The survey was conducted from July 8th to August 8th 2014, and at the end 51 questionnaires were collected, as it was planned.

Table 6 – Selection of ES from CICES classification (Haines-Young and Potschin 2013) made by the focus group. Per each ES class, a code has been attributed.

Section	Group	Class	Class Code
1.Provisioning	Biomass	Cultivated crops	11
		Reared animals and their outputs	12
		Wild plants, algae and their outputs	13
		Wild animals and their outputs	14
	Water	Surface water for drinking purposes	15
	Biomass	Fibers and other materials from plants, algae and animals for direct use or processing	16
	Water	Surface water for non-drinking purposes	17
		Ground water for non-drinking purposes	18
	Biomass-based energy sources	Plant-based resources	19
2.Regulating and Maintenance	Mediation by ecosystems	Mediation of smell/noise/visual impacts	22
	Mass flows	Stabilization, control and attenuation of erosion rates and mass flows	23
	Liquid flows	Hydrological cycle and water flow maintenance	24

	Lifecycle maintenance, habitat and gene pool protection	Maintaining nursery populations and habitats	26
	Pest and disease control	Pest and Disease control	27
	Soil formation and composition	Weathering processes	28
		Decomposition and fixing processes	29
	Water conditions	Chemical condition of freshwaters	210
	Atmospheric composition and climate regulation	Global climate regulation by reduction of greenhouse gas concentrations	211
		Micro and regional climate regulation	213
	3.Cultural	Physical and experiential interactions	Experiential use of plants, animals and land-/seascapes in different environmental settings
Physical use of land-/seascapes in different environmental settings			32
Intellectual and representative interactions		Scientific	33
		Educational	34
		Heritage, cultural	35
		Entertainment	36
		Aesthetic	37
Spiritual and/or emblematic		Symbolic	38
Other cultural outputs		Existence	310
		Bequest	311

Mapping ES perception

For each CICES Class (see Annex 1), a thematic map of related perception was created. According to the interviewees' answers, the source of each perceived service was localized on CLC map in GIS environment (ArcMap 10.1; ESRI, 2011).

At first, for a given CICES class and for each polygon on CLC map, the average ESP value was calculated by the following equation [1].

$$ESP_j^k = \frac{\sum_{i=1}^n (ESP_i^k)_j}{n} [0 \div 1] \quad [1]$$

where: ESP_j^k is the ESP value for the j-th CICES Class and the k-th polygon on CLC map; ESP_i^k is the i-th observation of ESP for the k-th polygon on CLC map and for the j-th

CICES class; n_j is the total number of ESP values (i.e. observations) within the j-th CICES class.

Secondly, for each CLC and CICES class, the ESP value was calculated through the following equation [2].

$$ESP_j^m = A_k^m \times ESP_j^k [0 \div 1] [2]$$

where: A_k^m represents the correspondence between the k-th polygon on CLC map and the m-th CLC class, expressed in the following form:

$$A = \begin{pmatrix} A_1^1 & \dots & \dots \\ \dots & A_k^m & \dots \\ \dots & \dots & A_K^M \end{pmatrix}$$

where: k is the total number of polygons; and m is the total number of CLC Classes.

Then, the ESP map was obtained by associating the ESP value for each CICES class with the CLC Classes.

Furthermore, for each report on the map the distance between the point and the respective centroid (7 were identified, one in every municipality of the BR) has been calculated. Each distance segment has been associated with the respective CICES class of reference.

4.2.4 Results

Assessment of ecosystem services perception

By processing the interviews data collected, eight different socio-demographic and economic categories of stakeholders were identified: no working age residents, farmers and stockbreeders, cheesemakers, forestry operators, truffle collectors, tourist operators, dealers, visitors/tourists.

The total number of answers given by the stakeholders was 1,479 within 29 ES classes investigated through the questionnaire. As first result, the stakeholders were not able to localize on map all the 29 ES classes, thus we got georeferenced data for 23 ES

classes. This means that the results hereafter will consider only the answers associated at a localization on map - called report – that are 833 in total. The ES classes not localized are: 14, 16, 18, 211, 310, 311. The distribution of the reports per each CICES Section are: Provisioning (section 1) = 20.41%; Regulating and Maintenance (section 2) = 33.37%; Cultural (section 3) = 46.22%.

Looking at the Figure 6, in the section provisioning the two highest average ESP values refer the cultivated crops ES (class 13; ESP value = 0.756) and plant-based resources ES (class 19; ESP value = 0.862). For the section regulating and maintenance, the average ESP is more concentrated on the maintaining nursery populations and habitats ES (class 26; ESP value = 0.706) and the weathering processes ES (class 28; ESP value = 0.615). In the section cultural, the aesthetic (class 37; ESP value= 0.765) and the symbolic ES (class 38; ESP value= 0.887) are the highest perceived ones by the stakeholders.

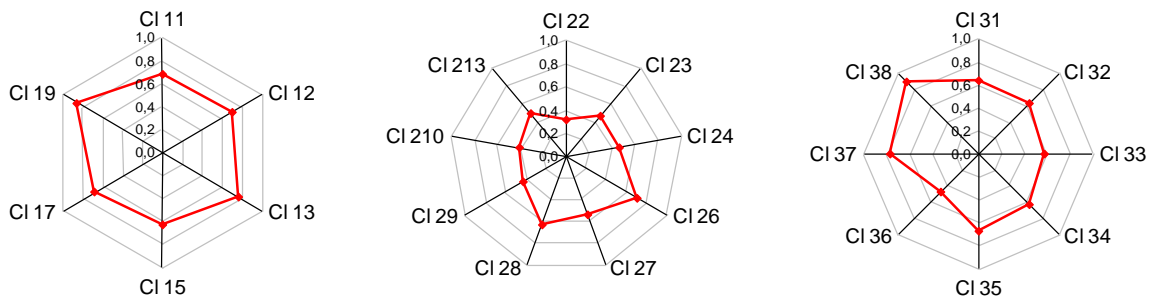


Figure 6 – Spider charts representing the average ESP values for each CICES classes (CI) in sections 1, 2, 3.

A calculation of the distance between the source of ES perception and the centroids (they were 7, one for each municipality) of the interviews has been carried out for each ES class to understand how these two parameters interact each other. The boxplot (Figure 7) shows a general inversely proportional trend: the shortest is the distance between the centroid and the reports locations, the highest is the number of reports. Specifically, for the section 1, the boxes are short and this indicates that the provisioning ES are averagely perceived relatively close to stakeholders' centroids; moreover, the maximum distance of perception reaches 8.1 km (class 12). In the section 2, the boxes are little longer than in the previous section ones, but some classes show long whiskers

reaching over 12 km of maximum distance (such as in the class 22), and some very high outliers (like in the case of classes 23 and 28). In the Section 3, the situation is very different: the average distances of perception of ES classes are visibly longer than in the previous sections ones, with highest peak at almost 18 km distant from the calculated centroid (class 35). Several maximum dots and outliers make the perception of distance of the Cultural ES very variable. The boxplot has been realized with the software XLSTAT 2015.

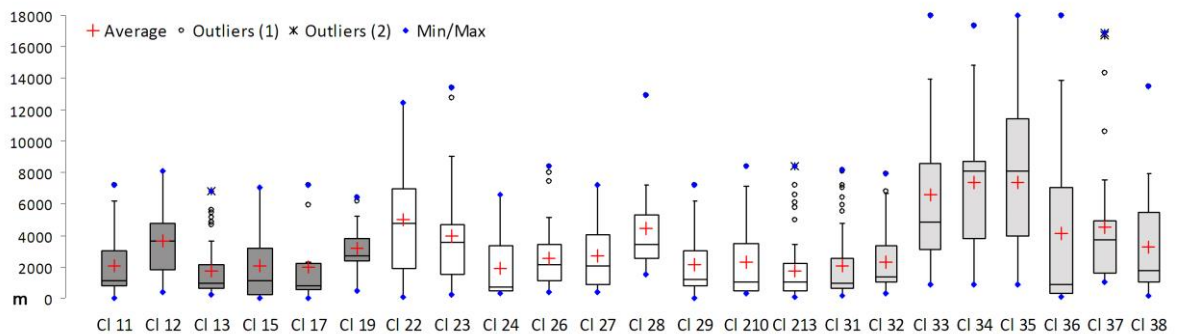


Figure 7 – Boxplot showing the distribution of distances (m) of the reports from the centroids per each ES Class.

Mapping ecosystem services perception

The average ESP values per CICES classes have been intercepted with the corresponding CLC polygons where the reports were localized. In the Table 7, all the CLC hierarchical classes and respective codes present in the BR landscape are shown, also with each percentage of covering. The results of this interception are three BR maps that show where stakeholders have perceived ES in the landscape and with what intensity (ESP values: very low, low, high, very high). In particular, the Figure 8 representing the section provisioning evidences the prevalence of polygons belonging to the CLC classes 3, forests and semi-natural areas, and the average highest ESP values refer to the broad-leaved forests, as the Table 8 shows in details. In the same section, mean-low ESP values are noticed for the CLC class 1 (artificial surfaces); instead, for the CLC class 2 (agricultural areas) the agricultural pastures are quite balanced reported in the ESP values categories (except for the “high” one).

In the section 2 (Figure 9), the polygons belonging to the CLC class 3 are again the most diffused; moreover, the riparial vegetation along the watercourses and the

agricultural pastures emerge well in the map. However, the average ESP values attributed to the regulating and maintenance ES are mean-low in all the three CLC classes (see the Table 9).

The polygons localized in the section 3 (Figure 10) present the dominance of CLC class 3, with mean-high ESP values attributed mostly to broad-leaved forests. In addition, the artificial surface, although are poorly represented in terms of extension, obtained a mean-high ESP values, in particular for the urban fabrics. Instead, the CLC class 2 is not widely represented, also with anomalous ESP values: or low or very high (see Table 10).

Table 7 – Corine Land Cover hierarchical classes and their covering on the BR landscape (%).

Corine Land Cover classes			% Covering
1 - Artificial surfaces	11 - Urban fabric	111 - Continuous urban fabric	0.323
		112 - Discontinuous urban fabric	0.279
	12 - Industrial, commercial and transport units	121 - Industrial or commercial units	0.016
		122 - Road and rail networks and associated land	0.010
	13 - Mine, dump and construction sites	131 - Mineral extraction sites	0.002
		133 - Construction sites	0.065
	14 - Artificial non-agricultural vegetated areas	141 - Green urban areas	0.022
		142 - Sport and leisure facilities	0.055
2 - Agricultural areas	21 - Arable land	211 - Non-irrigated arable land	3.115
		221 - Vineyards	0.034
	22 - Permanent crops	222 - Fruit trees and berry plantations	0.046
		223 - Olive groves	0.432
	23 - Pastures	231 - Pastures	9.483
	24 - Heterogeneous agricultural areas	242 - Complex cultivation patterns	0.049
244 - Agro-forestry areas		0.194	
3 - Forests and semi-natural areas	31 - Forests	311 - Broad-leaved forest	61.925
		312 - Coniferous forest	3.418
		313 - Mixed forest	0.642
	32 - Shrub and/or herbaceous vegetation association	321 - Natural grasslands	11.908
		322 - Moors and heathland	7.900
33 - Open spaces with little or no vegetation	333 - Sparsely vegetated areas	0.075	
5 - Water bodies	51 - Inland waters	511 - Water courses	0.002
		512 - Water bodies	0.004

Section 1

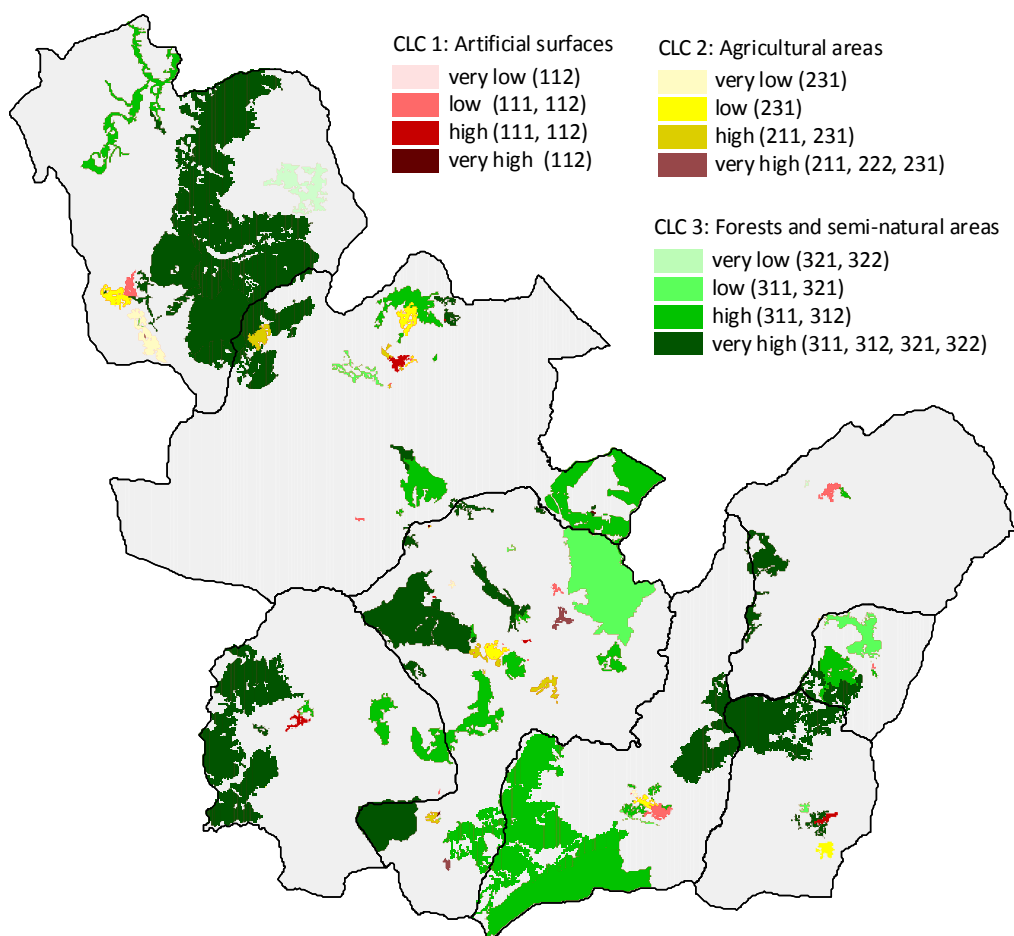


Figure 8 – Distribution of average ESP values in the CLC polygons that contain the stakeholders’ reports for the Section Provisioning. Three color scales represent the three CLC classes, each one with four grade of intensity of ESP value. In brackets, the corresponding CLC classes attributed to the polygons are indicated.

Table 8 – Relative abundance (%) of four ranges of ESP values per each CLC class in Section 1.

Section 1 - % area (m ²)				
CLC Classes	Very low	Low	High	Very high
111	0	57.66	20.54	14.96
112	0.29	3.51	0	3.04
211	0	0	0.51	4.51
222	0	0	0	0.16
231	24.45	38.56	0.15	31.67
311	0	8.12	11.24	75.01
312	0	0	0.48	0.89
321	0.02	0.03	0	0.85
322	1.53	0	0	1.83

Section 2

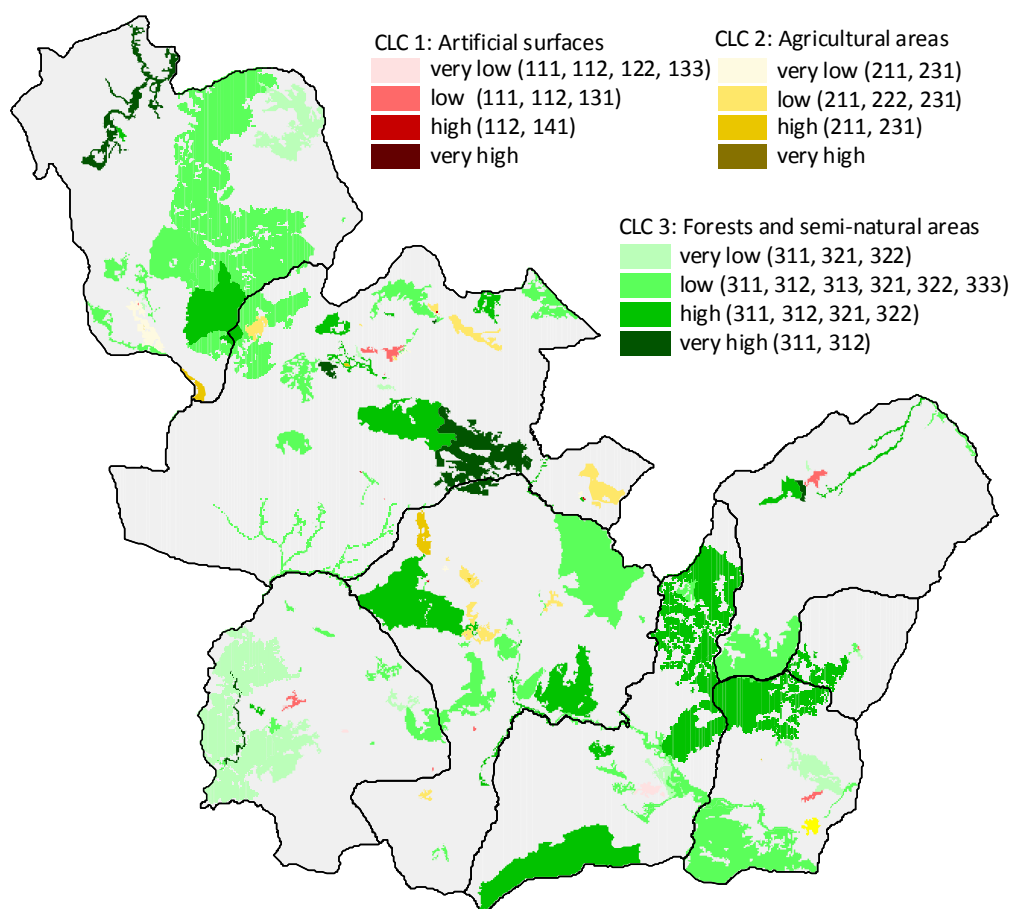


Figure 9 – Distribution of average ESP values in the CLC polygons that contain the stakeholders’ reports for the Section Regulating and Maintenance. Three color scales represent the three CLC classes, each one with four grade of intensity of ESP value. In brackets, the corresponding CLC classes attributed to the polygons are indicated.

Table 9 – Relative abundance (%) of four ranges of ESP values per each CLC class in Section 2.

Section 2 - % area (m ²)				
CLC Classes	Very low	Low	High	Very high
111	19.09	55.25	0	0
112	1.87	1.87	0.93	0
122	0.23	0	0	0
131	0	0.98	0	0
133	19.61	0	0	0
141	0	0	0.18	0
211	0.10	2.83	0.48	0
222	0	0.11	0	0
231	17.29	62.43	16.77	0
311	10.54	42.54	27.19	5.87
312	0	0.69	5.77	0.11

313	0	0.23	0	0
321	0.59	2.44	0.67	0
322	2.32	0.94	0.08	0
333	0	0.01	0	0

Section 3

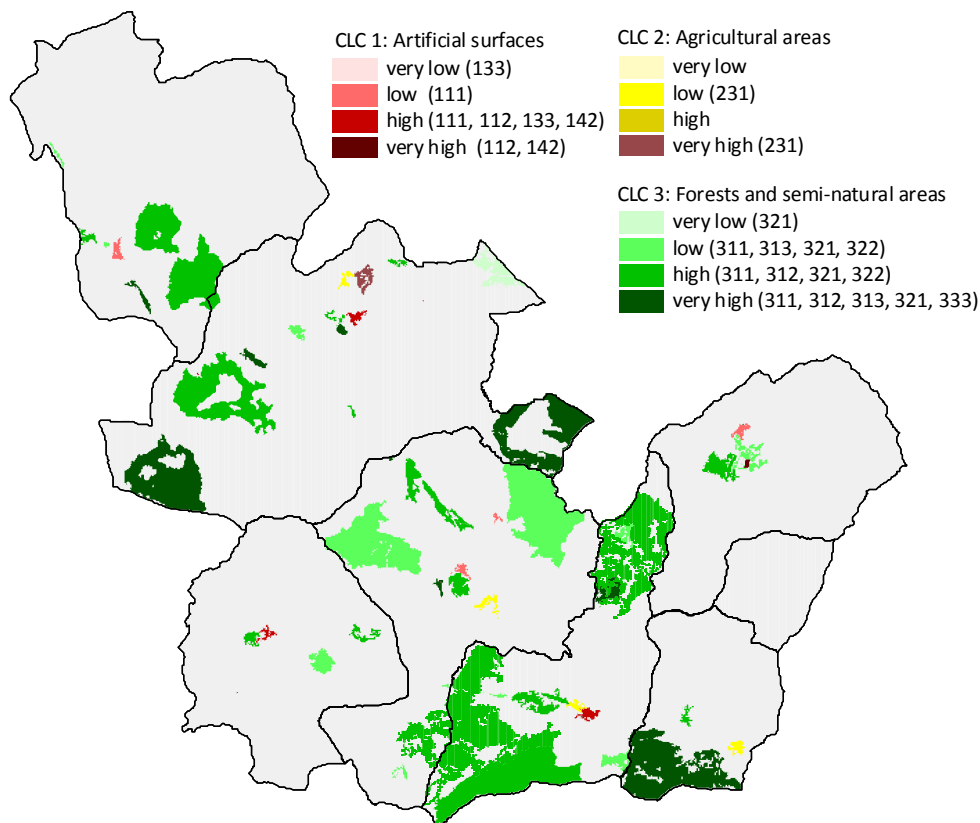


Figure 10 – Distribution of average ESP values in the CLC polygons that contain the stakeholders' reports for the Section Cultural. Three color scales represent the three CLC classes, each one with four grade of intensity of ESP value. In brackets, the corresponding CLC classes attributed to the polygons are indicated.

Section 3 - % area (m2)

CLC Classes	Very low	Low	High	Very high
111	0	41.72	38.72	0
112	0	0	0.34	0.12
133	15.61	0	0	0
142	0	0	0.08	3.41
231	0	57.45	0	42.55
311	0	18.28	41.81	22.32
312	0	0	9.79	0.16
313	0	0.40	0	0.67
321	1.53	1.02	3.10	0.46
322	0	0.19	0.26	0
333	0	0	0	0.01

4.2.5 Discussion

Assessing ecosystem services perception

According to the results showed in Figure 8, amongst the provisioning ES most widely perceived are “Plant-based resources” and “Cultivated crops”. About the first one, the stakeholders demonstrated to perceive the forests as the main source for producing biomass to be used for generating energy and, in particular, they use wood (coming from the BR landscape) and pellet (often coming from abroad) for heating. Moreover, the stakeholders have a high perception of cultivated crops ES for producing food for people and animals, because even if the agricultural activities have been reduced in the last decades (although from 1982 to 2010 the ratio between UUA (Utilized Agricultural Area) and TAA (Total Agricultural Area) in the BR is remained stable – around 0.53 – the UUA decreased of 57% in the same period, because of the abandonment of agricultural lands and the consequent land renaturalization by forests; ISTAT 2010), today cultivating the land (more for a self-production rather than for income) remains always a common practice (Agnoletti 2011).

For what concerns the regulating and maintenance ES, the second spider chart shows that maintaining nursery population and habitats ES are well perceived by stakeholders, who are aware of the importance of conserving the landscape biodiversity. Averagely high resulted also the ESP value for weathering processes ES, because people consider important the soil characteristics in terms of structure, water and nutrient content for improving their working activities (pasture, agriculture, mushrooms and truffles gathering).

Analyzing the section cultural, it emerges that people consider the BR landscape particularly valuable from the aesthetic perspective, indeed multiple times during the interviews stakeholders spoke about beautiful vistas as a strength point of their landscape under the perspective of fruition. Moreover, symbolic ES are highly perceived by people and this can be interpreted as a demonstration of a strong feeling of stakeholders towards something (such as, animal or vegetal elements, vistas, cultural or

religious heritage) in the landscape that represents their sense of belonging to that territory.

From the Figure 9, it is evident how the provisioning and regulating ES are perceived averagely at a lower distance than the cultural ES. The only exception is the class 22, which corresponds at the mediation of smell, noise or visual impact: in this case, the stakeholders demonstrated to perceive such disturbing sources in the landscape even at an average long distance from their respective centroids. Furthermore, the distance of ES perception depends mostly from the specific function that the ecosystem can express and the benefits people might receive from it (Lamarque et al. 2011; Mascarenhas et al 2014). Indeed, some ES benefits, like wood supplying from the woods, wild plants and fruits gathering (in reference of provisioning ES) and other ES benefits such as the good quality of freshwater and the microclimate regulation capacity proper of the biophysical characters of the landscape (in reference of regulating ES), seem to have a reason to be perceived only if they are close to the beneficiary. Instead, the results shows that the socio-cultural values such as the aesthetic, recreational, religious and symbolic ones (in reference of cultural ES) are in the stakeholders' mind even if their sources are not located right next to respondents' living place.

On the contrary, analyzing the closeness between the stakeholders and the sources of ESP it emerges that the surface water for non-drinking purposes service is perceived as the “closest” one amongst the provisioning ES. The reason is that this service is mostly associated with the use of rainwater for irrigating the family gardens, especially during the summer, so its perception by people results very close to the respective centroids of the stakeholders' municipality of belonging. In addition, considering the section regulating, the “closest” service perceived is micro and regional climate regulation; about this ES, stakeholders focused the attention on the natural areas next to their living places, especially the forests as the main responsible for producing O₂ and bring down the CO₂ emissions, and on certain biophysical and geomorphological characteristics (such as the vegetation, a river, a mountain) of their close surrounding landscape that can influence the micro climate.

Mapping ecosystem services perception

Traditionally, the forests, grasslands and agricultural lands of the BR landscape have been always the main source for livelihood and income for the inhabitants of this territory and, even if this usage of natural resources today is reduced very much (AA. VV. 2014), it is undeniable that forests, semi-natural areas and agricultural areas still constitute the main provisioning and regulating sources of ES, and in particular forests are dominant in terms of polygons reported in each one of the 7 municipalities of the BR, as the Figure 10 shows. In terms of agricultural areas, if looking at the ESP values ranges attributed to the agricultural pastures polygons, there are not great differences in terms of overall extensions of these polygons. This probably means that different categories of stakeholders have associated different ESP values to the agricultural pastures. Indeed, the values attributed to the ES are determined by the social preferences of different stakeholders' group (Martín-López et al., 2012), which in turn depend on their knowledge-systems (i.e., experiential vs technical) as well as the type of connection to their environment (i.e., high dependency to the provision of ES vs low dependency) as Iniesta-Arandia et al. (2014) have recently demonstrated. Furthermore, the differences in terms of perception intensity depend also from the typologies of questions asked that were included in the section of which the results are visualized on the map. Indeed, in the case of CLC class 1 of provisioning ES, the relative high percentage of ESP connected to the urban fabric (see Table 8) refers to the questions about the quality of water for drinking purposes and the stakeholders have perceived the source of this ES in proximity of fountains in the villages.

The results of the section 2 reveal that the main ecosystems where they were localized are still the forests and semi-natural areas, but with not such strong average ESP values attributed to the polygons. It happens in general terms to the CLC classes 2 and 3, so it is possible to affirm that the regulating and maintenance ES are not highly perceived by stakeholders. Moreover, the agricultural areas are assessed mostly with low ESP values, so it seems that there is a scarce perception of the important role that the working lands can play in terms of regulation of ES; this result depends, again, from the typologies of questions asked to the stakeholders, and in this case to those about the

weathering processes (see Annex 1) in which the rural lands are very involved. Furthermore, the stakeholders did not tend to associate the regulating and maintenance ES with the artificial surfaces (indeed, their ESP values are low), such as the urban fabrics of their municipalities.

The perception of cultural ES regards forests and semi-natural areas with mean-high ESP values, and in particular some woods in the BR landscape are identifiable for being frequented for example for enjoying time in nature by hiking, making sports, biking, educational activities etc. For these purposes, Montedimezzo and Collemeluccio forests, the two historical nuclei of the BR, are very positively assessed, like also Bosco Pennataro (another BR core area), Bosco Sant’Onofrio and Bosco La Coccozza, where the aesthetic beauty is joint with the feasibility to carry out recreational activities. For what concerns the agricultural areas, there are two results. From one hand, low ESP values were attributed to agricultural pastures, mostly because stakeholders did not associate the agricultural lands with some kind of socio-cultural benefits, as it has been also demonstrated by García-Nieto et al. (2014) in a rural area in Andalusia. From the other hand, instead, very high ESP values were attributed to this CLC class, because they refer to a landscape typology that has very relevant intrinsic, symbolic and memorable values: the drove roads. In particular, in the output of Section 3, Celano-Foggia drove road has been assessed in its visible portion on agricultural pastures in the municipalities of San Pietro Avellana and Vastogirardi. The Castel di Sangro-Lucera, instead, has been reported in multiple CLC classes: shrublands, agricultural pastures and urban fabric, in the municipality of Pescolanciano. Thus, stakeholders have a manifold perception of this cultural landscape. Finally, the ESP values related to the artificial surfaces are mean-low for the urban fabrics, while some hot spots of cultural heritage emerged amongst the rural fabrics. It is the case, for example, of rural churches load of symbolic, religious and memorable values, even connected to the transhumance traditions.

Improving BR landscape management by involving local communities

According to the management plan guidelines of the BR (AA. VV. 2014), amongst its objectives there is the valorization of the cultural landscape, which is a rural landscape,

with its traditional agri-silvo-pastoral practices. It is unavoidable to involve local communities to reach this purpose, in whole consistency with the UNESCO recommendations for the Man and Biosphere Program (UNESCO 2014). In this framework, this research can be considered helpful for understanding priorities and needs of inhabitants and tourists in terms of valorization of BR rural landscape. For instance, one result in this direction is that stakeholders demonstrated to enjoy the landscape (in a broad sense) more in the woods than in the rural areas. Moreover, the cultural heritage has a strong symbolic power for them, even if it is represented mostly by “single spots” in the landscape, such as rural churches, but it is not well integrated with the rest of rural landscape, which remains, according their perceptions, a background not completely benefitted.

Another important point in which the involvement of local communities can contribute to valorize the rural landscape is what emerged from the drove roads issue. These vast herbal tracks are not easily visible today, because the transhumance is not practiced anymore, but the strong perception of stakeholders of this cultural landscape is worth to be taken in consideration for the future management of the BR, unless to lose the memory of this particular expression of the territory with the new generations.

Furthermore, under a methodological point of view, during the field phase the researchers have noticed that the first tentative of experimenting the community mapping revealed that the stakeholders interviewed were not so much able to use autonomously the maps (both the digital and the paper ones) to identify places and objects regarding their own landscape, but a facilitator was always needed. It depended, of course, of the kind of education that stakeholders have received in the past and if they were familiar with this tool. However, their narratives inherent and beyond the survey questions were precious to understand the connection of people with their landscape resources. In addition, using visual stimuli has allowed reaching the purpose as well.

4.2.6 Conclusion

This research wants to highlight the importance of investigating the stakeholders' perception of ES in their own landscape that has the UNESCO acknowledgment of Biosphere Reserve. For this purpose, the technical concept of ES has not been explained to interviewees, neither used in the questions, properly to understand if the stakeholders were aware of the possible connections and functions that exist amongst the natural, semi-natural and artificial systems that characterize the BR landscape.

In terms of limitation factors of the approach adopted in this research, one might be that the economic perception of ES has not been investigated, rather only the social perception. Even if the BR landscape management (that is the aim for which this research wants to contribute to) needs to deal with the economic aspects, the first step is to understand if people are aware of the ES and their benefits, and then possibly how much they evaluate them in monetary terms. Therefore, the last point might be a further way of investigation in the future.

Another potential limit is that the maps of ES perception do not cover entirely the BR surface, but allow visualizing only the polygons that effectively include the perception reports. Although this method is correct from the data interpretation point of view (nevertheless, other methods like SolVES - reported in the paragraph 3.2.1 – map differently the social values of ES with a calculation metrics that allows to cover all the investigated area), it cannot guarantee a complete usefulness of the maps for the entire BR landscape (again, in a management perspective); this is because some areas are excluded due of reports lacking and not because their ESP values are zero. For a future improvement of the method, probably a more numerous sample of interviewees might reduce the “empty areas”.

Beyond the methodological limitations, a lacking point of this research emerges when analyzing some results of perceptions: the average ESP value associated to a CICES section and to a specific CLC class sometimes depends too much strongly from the question that lies behind the elaboration and that can influence the stakeholders' assessment.

According to the results shown here, the stakeholders have a stronger perception of provisioning ES rather than of regulating ES. Both these two CICES sections are mostly

localized in the forests and semi-natural areas. In particular, amongst the provisioning ES it has been noticed a detachment in perception between the forests/semi-natural areas and the agricultural areas. Indeed, while the forests in particular emerged strongly with high ESP values, because they are the main land cover in the BR and the principal source of provisioning resources, even historically, the agricultural pastures got low ESP values, probably as a consequence of the rarefaction of the agricultural sector in the BR landscape, today still in decreasing phase.

The unexpected general low perception of the regulating and maintenance ES suggests that in the planning process of the BR landscape, the involvement of local communities should be taken in consideration even as an educational moment, where the ES approach can lead the discussions finalized to the BR management in a systematic and integrative framework.

The results concerning the perception of cultural ES demonstrated that stakeholders associate high values (aesthetic, symbolic, religious ones) to urban and discontinuous fabrics and to forests (recreational and symbolic values), while low cultural values are attributed to the agricultural areas (with the only exception of some drove roads patches). Hence, it would need a stronger effort in the management policies of the BR for integrating the cultural hot spots with the rest of the rural landscape matrix.

In conclusion, this research is a first attempt for assessing and mapping the stakeholders' perception on ES for including them into a joint management action, where local knowledge needs to match the expert knowledge, but more studies in this direction are needed. In this framework, it is important to consider the differences in perception of diverse actors involved as much as possible. The future of the BR is encased in the valorization of its cultural and rural landscape, thus the direction towards leading the participative management is by incentivizing the agricultural compartment, both in the productive and cultural-recreational sense, as also the main national and international policies are pushing today (e.g. the new CAP 2014-2020). Linking the working land concept with the aesthetic dimension of the cultural and rural landscape is the key step from where planning the shared future of the BR.

End note

Because the research here presented constitute the draft of a peer review paper still in preparation, it is useful to specify that the next progress step is to join the data of ES perception here shown with the preexistence framework of territorial planning, which is fragmented and sector-related (always in order to link the local to the technical and expert knowledge) to build up more integrative guidelines towards which lead the BR landscape management, hoping in as much shared way as possible.

4.2.7 Appendix 1: questionnaire to assess the ES perception in the BR

The table below (Table 11) shows how the hierarchical CICES classification (Haines-Young and Potschin 2013) has been adapted for investigating the ES perception in the BR landscape, and the reference questions used for the questionnaire are reported in correspondence of each ES class (it lets note that in some cases more than one class has been joint under the same broad question). Interviewees were called to answer by giving a qualitative value for their perception, ranging between 0 and 1. In this way, each question has been representative for a given ES class.

Table 11 - Correlations between the investigated CICES classes and the questions used during the interviews.

CICES					Survey
Section	Division	Group	Class	Class type	Associated question
Provisioning	Nutrition	Biomass	Cultivated crops	Crops by amount, type	What is your perception about the production and distribution of traditional/local products from cultivated crops? What are the most exchanged (sold) products?
			Reared animals and their outputs	Animals, products by amount, type	Do reared animals provide meat, dairy, and/or other secondary products for local market or consumption? What are the most frequent reared animal breeds in the landscape?
			Wild plants, algae and their outputs	Plants, algae by amount, type	If you think at the natural or semi-natural environment in the surroundings, do you know any products that come from there and that you usually use?
			Wild animals and their outputs	Animals by amount, type	How do you perceive the role of gaming, hunting, and fishing activities in providing edible products for local consumption and selling? Which kind of activities are mostly perceived as providers?
			Plants and algae from in-situ aquaculture	Plants, algae by amount, type	Not considered
			Animals from in-situ aquaculture	Animals by amount, type	Not considered
		Water	Surface water for drinking	By amount, type	Do you have the perception that the surrounding natural environment provides water catchments for drinking purposes? How fresh water is distributed to people living close to such environments?
			Ground water for drinking	By amount, type	Not considered

CICES					Survey	
Section	Division	Group	Class	Class type	Associated question	
	Materials	Biomass	Fibres and other materials from plants, algae and animals for direct use or processing	Material by amount, type, use, media (land, soil, freshwater, marine)	Do you have the perception that forests provide timber products in a suitable way to sustain local communities' needs?	
			Materials from plants, algae and animals for agricultural use		Not considered	
			Genetic materials from all biota		Not considered	
		Water	Surface water for non-drinking purposes	By amount, type and use	What is your perception about the quality and quantity of water which is currently used for non-drinking purposes (e.g. for agricultural activities)? What are the main water sources for such purposes?	
			Ground water for non-drinking purposes			
		Energy	Biomass-based energy sources	Plant-based resources	By amount, type, source	Do you perceive that forests in your area are sufficiently able to provide biomass-based energy sources? Which kind of biomass-based products are currently at use from local communities?
	Animal-based resources			Not considered		
	Mechanical energy		Animal-based energy	Not considered		
	Regulation & Maintenance	Mediation of waste, toxics and other nuisances	Mediation by biota	Bio-remediation by micro-organisms, algae, plants, and animals	By amount, type, use, media (land, soil, freshwater, marine)	Not considered
				Filtration/sequestration/storage/accumulation by micro-organisms, algae, plants, and		Not considered

CICES					Survey	
Section	Division	Group	Class	Class type	Associated question	
Regulation & Maintenance			animals			
		Mediation by ecosystems	Filtration/sequestration/storage/accumulation by ecosystems		Not considered	
			Dilution by atmosphere, freshwater and marine ecosystems		Not considered	
			Mediation of smell/noise/visual impacts		By amount, type, use, media (land, soil, freshwater, marine)	If you concentrate on some acoustic, olfactory and visual impacts that you can notice in the BR area, do you think they are cushioned by the surrounding natural environment?
	Mediation of flows	Mass flows	Mass stabilisation and control of erosion rates	By reduction in risk, area protected	Do you feel protected against natural hazards (i.e. landslides, avalanches, rock falls, etc.) from the surrounding landscape? From your opinion, how the natural environments may improve such protection and regulate hydrologic processes?	
			Buffering and attenuation of mass flows			
		Liquid flows	Hydrological cycle and water flow maintenance	By depth/volumes		
			Flood protection	By reduction in risk, area protected		
		Gaseous / air flows	Storm protection	By reduction in risk, area protected		Not considered
			Ventilation and transpiration	By change in temperature/humidity		Not considered

CICES					Survey
Section	Division	Group	Class	Class type	Associated question
	Maintenance of physical, chemical, biological conditions	Lifecycle maintenance, habitat and gene pool protection	Pollination and seed dispersal	By amount and source	Not considered
			Maintaining nursery populations and habitats	By amount and source	Amongst these four pictures shot in the BR, which one do you think can represent the highest level of biodiversity in terms of plants and animal species? Which characteristics of the environment do you let thinking that?
		Pest and disease control	Pest control	By reduction in incidence, risk, area protected	What do you think about the pest and disease control carried out by natural and semi-natural environments in your landscape? Is it effective?
			Disease control		
		Soil formation and composition	Weathering processes	By amount/concentration and source	Do you think that the characteristics of the soil in terms of structure, water and nutrient content are effective for your working activities (pasture, agriculture, mushrooms and truffles gathering)? What are the main products that you may use to improve soil productivity?
			Decomposition and fixing processes		
		Water conditions	Chemical condition of freshwaters	By amount/concentration and source	How do you perceive the role of the natural environments in reducing the traces of chemicals and other contaminants?
			Chemical condition of salt waters	By amount/concentration and source	Not considered
		Atmospheric composition and climate	Global climate regulation by reduction of greenhouse gas concentrations	By amount, concentration or climatic parameter	In your opinion, is the whole BR environment able to contribute to climate change mitigation (at least at local scale)? Are there natural environments (i.e. forests) which are currently able to capture and storage Green House Gases from the atmosphere in
			Micro and regional climate regulation		

CICES					Survey	
Section	Division	Group	Class	Class type	Associated question	
		regulation			an efficient way?	
Cultural	Physical and intellectual interactions with biota, ecosystems, and land-/seascapes [environmental settings]	Physical and experiential interactions	Experiential use of plants, animals and land-/seascapes in different environmental settings	By visits/use data, plants, animals, ecosystem type	Has the BR landscape suitable features for enabling a coherent set of outdoor recreation activities/experiences? What kind of activities can you identify being performed in BR landscape?	
			Physical use of land-/seascapes in different environmental settings			
		Intellectual and representative interactions	Scientific	By use/citation, plants, animals, ecosystem type		Has the BR landscape suitable features for enabling different activities concerning scientific/educational/heritage/cultural/entertainment/aesthetics fields?
			Educational			
	Heritage, cultural					
	Entertainment					
	Spiritual, symbolic and other interactions with biota, ecosystems, and land-/seascapes [environmental settings]	Spiritual and/or emblematic	Symbolic	By use, plants, animals, ecosystem type	Does the BR landscape offer symbolic and/or religious places that are representative for local culture and traditions?	
			Sacred and/or religious			
		Other cultural outputs	Existence	By plants, animals, feature/ecosystem type or component	Do you think that BR can be considered a hotspot for preserving cultural landscapes? Do you think that BR is able to maintain the cultural identity over the time? In your opinion, what are the elements making the BR landscape unique by a cultural point of view?	
			Bequest			

4.3 Further results from the applicative case (not spatialized data)

Contents:

- From the case study illustrated in the previous paragraph, further (not spatialized) data are shown
- The connection between the socio-demographic characteristics of the stakeholders and their visual perception of landscape is described
- A statistical calculation for identifying the similarities in ES perception amongst the different categories of stakeholders involved in the study is reported

In the context of the research described in the previous paragraph, here it wants to deepen the issue of the socio-demographic data of the stakeholders involved in the study in the BR with the purpose to remark the importance of considering the ES perception always contextualized in a certain social group.

Furthermore, this paragraph is dedicated to some of the not spatialized data that are not present in the previous paragraph, which is the draft of a peer review paper, because it deliberately focused only on the mappable data, as it has been seen.

Visual perception of landscape

As it has been already said, during the survey visual stimuli were used to involve better the stakeholders in the main theme of the interviews, which is the perception of landscape (just a step before the perception of ES that is the research focal point). Indeed, it was important to understand first their visual perception of the BR landscape, so two sets of pictures taken in the BR were used for this purpose. By showing the first set (Figure 11), it was asked to stakeholders the most beautiful two pictures and the ugliest worst ones. Let notice that a balanced number of “undisturbed” and “disturbed” vistas composed this set of images on purpose. Instead, with the second set of pictures (Figure 12) it was asked the two most familiar images. Those aspects investigated by using the visual stimuli are important in the management perspective, which has to include what people would like to protect and valorize, or even transform.

The data about the visual perception of the landscape, then, were intersected with the different age classes of the interviewees (see Table 12) to understand if there was a sort of trend of preferences given by the age of the stakeholders.

Table 12 – Percentage of interviewees per age classes.

Age classes of interviewees	% Interviewees
≤ 18	5.88%
19 – 30	21.57%
31 – 51	27.45%
52 – 65	31.37%
≥ 66	13.73%

According to the results for the first set of images, the pictures more liked overall were n. 1 (20.59%), n. 11 (17.65%), n. 7 (16.67%). The reasons were different, but everyone nominated the aesthetic value represented in the pictures. Crossing the results with the demographic data, it appears that the youngest (≤ 18 years old) and the oldest (≥ 66 years old) interviewees chose mostly the n. 1, both the groups with 28.57%. People of the two intermediate age groups (19-30; 31-51) chose mostly the picture n. 11, respectively with 22.73% and 21.43%. Instead, the interviewees belonging to the age group 52-65 years old chose specially the n. 7 (25%); specifically about that, the choice was not only for the beauty, but also because the picture recalled to a “lived landscape” (probably adult people feel closer to the rural landscape than young people), with cultivated fields and woods, which corresponds also to the “Savanna-like landscape” (mixed matrix with open fields, isolated trees, streams and woods), so instinctively appreciated by humans because of the long evolutionary time spent in that landscape (see paragraph 1.2.1 of this thesis). An interesting result is that the 7% of total interviewees chose the picture n. 12 (wind turbines) as a “beautiful photo” (instead, that one belonged to the “ugly pictures group”, because it represented a disturbed landscape) and, in addition, all of them were less than 31 years old. This means that some young people associated the positivity of the renewable technologies with the concept of a “good landscape”.

The pictures in the first set more disliked were n. 10 (28.43%), n. 2 (22.55%), n. 12 (21.57%) and the reasons are mostly connected to a bad aesthetic vision and worries regarding the health (especially for the picture n. 2 representing a mobile antenna). In this case, the choices distributed per age groups are: the pictures n. 12 and n. 10 were chosen on a par as the ugliest by both the youngest and the oldest people (≤ 18 years old; ≥ 66 years old) with respectively 33.33% and 28.57%. The n. 10 was chosen mostly by interviewees of the two intermediate age groups (19-30; 31-51) with respectively 36.36% and 32.14%. People of the age group 52-65 years chose principally the picture n. 2 (28.13%). In general, it also has been noticed that, while for the “beautiful pictures” it was registered a high variety of couple of photos chosen by stakeholders, for the “ugly pictures” people demonstrated a major uniformity in the selection and in the motivations of the choices.

Analyzing the data for the second set of pictures, the most familiar images considered very close to interviewees’ experiences were overall n. 18 (27.45%), n. 19 (14.71%). In the first case, a path in the woods stimulated a sense of wellness, pleasant walks and nice memories of hiking; also the economic perspective emerged, because of the woods cutting and the gathering of non-forest products. In the second case, a sheep grazing stimulated people to this economic activity so important in the past for the territory, that now still lives only in small farms and in the traditional and cultural events. About the age groups, surprisingly, again, the youngest and the oldest interviewees aligned their thoughts, choosing mostly the picture n. 19, respectively with 33.33% and 28.57%; instead, all the other age groups chose primarily the n. 18: 19-30 years old with 31.82%, 31-51 years old with 28.57%, and 52-65 years old with 34.38%.

The weak point of this test was the scarce numbers of the total respondents for tracing a sort of preferences line across the age classes of the BR population. Thus, further studies in this direction are needed. However, it was found that the age classes were distributed in a balanced way (Table 10) within the sample.

Finally, if considering that the BR population is becoming older, from these results it emerges that people care for conserving their traditional landscape (also with a sort of “static and nostalgic vision” of the landscape) and, while the major of them are worried

about the impact of transformations, mostly on the health (e.g. mobile antennas), they ask for tools and technologies to keep pace with the times in the rural and quite isolated landscape where they live.

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Figure 11 – The twelve pictures used for analyzing the interviewees’ visual perception of the landscape. They comprehend 6 “beautiful pictures” and 6 “ugly pictures” (with some impactful elements).

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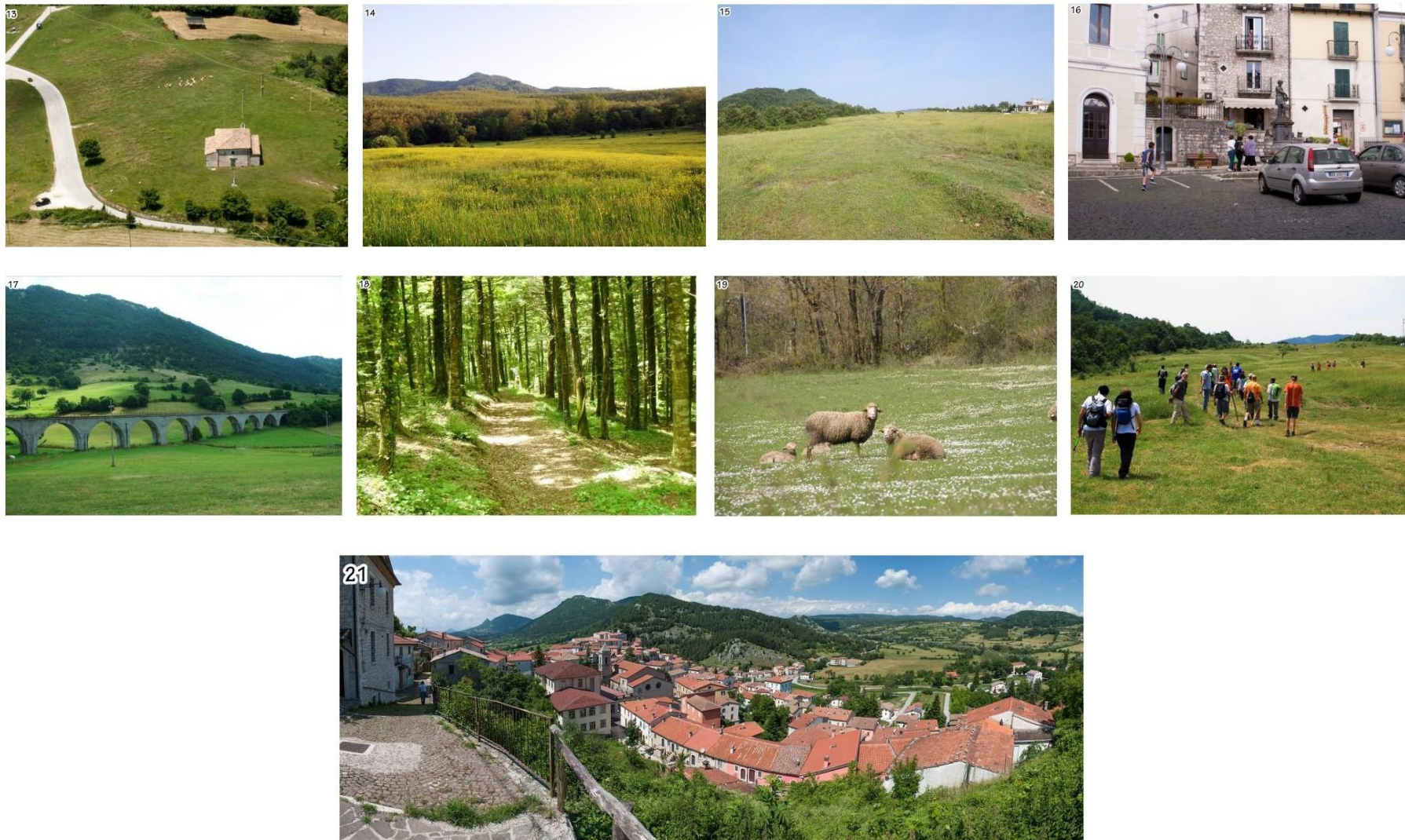


Figure 12 – The nine pictures used for analyzing the interviewees' visual perception of their most familiar landscape.

Stakeholders' differences in landscape perception

As it emerged in many studies (e.g. Martín-López et al., 2012; García-Nieto et al. 2014, Iniesta-Arandia et al. 2014), considering the differences amongst stakeholders in terms of perception and needs related to the ES improves the effectiveness of decision-making processes aimed at the sustainable management of landscape.

In the case of Collemeluccio-Montedimezzo Alto Molise BR, the Kruskal-Wallis non-parametrical test was applied to verify if there are similarities amongst the assessments given by the different stakeholders for each CICES class. In general, the test demonstrated that there are not evident discrepancies, except for four classes (which results are shown in the Table 13) that have a p-value very close to 0.

The cultivated crops ES are perceived differently amongst farmers/stockbreeders and both visitors/tourists and truffle collectors. This means that people belonged to the first category are more aware about this provisioning ES (indeed they assessed it with the highest average ESP value amongst all the stakeholders) than the other two categories compared with, because, as it easy to imagine, the cultivated crops constitute their work matter. In addition, the truffle collectors averagely have a low perception of this ES class and one reason might be that these stakeholders are more interested in the woods, from which they benefit by collecting the precious tubers.

Looking at the class 13, the visitors/tourists differ in perception respect to all the others, probably because they experience the BR landscape not by gathering wild plants and fruits, as, instead, the other stakeholders usually do.

Regarding the perception of the regulation of pest and disease affecting the ecosystems, even this time the major perception of farmers and stockbreeders prevails on the other stakeholders' ones: the experience of people who work the land might be considered an important local knowledge to take into consideration in the decision-making processes.

Finally, the results on the class weathering processes reveal that farmers and stockbreeders and truffle collectors are more aware than the other stakeholders about the characteristics of the soil in terms of structure, water and nutrient content, because

these knowledge are useful for making more effective their working activities (pasture, agriculture, mushrooms and truffles gathering).

Table 13 – Kruskal-Wallis test applied by crossing the different stakeholders’ ESP values and grouped per CLC classes. Here only the four more relevant cases are shown. Test processed by the software XLSTAT, 2015.

Variable	Kruskal-Wallis K (p-values) [°]	Stakeholders	M	SD	Mr	Groups
11 - Cultivated crops	15.790 (0.001)	Farmers and stockbreeders	0.705	0.313	39.136	B*
		No working age residents	0.300	0.425	24.600	A, B
		Others ⁴⁴	0.278	0.341	23.833	A, B
		Truffle collectors	0.225	0.275	23.100	A*
		Visitors and tourists	0.000	0.000	13.500	A*
13 - Wild plants, algae and their outputs	18.965 (< 0.0001)	Farmers and stockbreeders	0.750	0.316	31.773	B*
		No working age residents	0.583	0.309	23.267	B*
		Others	0.833	0.177	34.833	B**
		Truffle collectors	0.725	0.184	28.400	B**
		Visitors and tourists	0.000	0.000	5.000	A*, **
27 - Pest and Disease control	29.389 (< 0.0001)	Farmers and stockbreeders	0.477	0.236	41.091	C*, ***
		No working age residents	0.000	0.000	18.000	A*, ***
		Others	0.056	0.167	20.722	A*, B*
		Truffle collectors	0.275	0.299	30.950	B*, C
		Visitors and tourists	0.000	0.000	18.000	A*, B*
28 - Weathering processes	26.649 (< 0.0001)	Farmers and stockbreeders	0.500	0.354	39.182	C*, **
		No working age residents	0.000	0.000	19.500	A**
		Others	0.000	0.000	19.500	A*, B*
		Truffle collectors	0.250	0.264	31.000	B, C
		Visitors and tourists	0.000	0.000	19.500	A, C

M = Mean; SD = Standard Deviation; Mr = Mean of ranks (Steel-Dwass-Critchlow-Fligner multiple comparison)

Steel-Dwass-Critchlow-Fligner comparison p-values: * p<0.05; ** p<0.01; *** p<0.0001

[°]Monte Carlo method: 10,000 resamplings

In conclusion, the Kruskal-Wallis test evidenced that in general there are not great differences amongst diverse stakeholders in perceiving the ES in the BR landscape. However, when the ES regard more strictly the use of rural landscape, such as for producing foods for human and animals from cultivated lands or gathering wild fruits and

⁴⁴ The stakeholder’s category “Others” include: Cheesemakers, Dealers, Forestry operators, Tourist operators.

plants from semi-natural ecosystems, or for controlling the pest and disease risk, the experiences of the stakeholders more involved in these practices emerge in making their ES perception stronger.

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ISTAT – DEMOGRAFIA IN CIFRE

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RISERVA MAB COLLEMELUCCIO-MONTEDIMEZZO ALTO MOLISE

<http://www.riservamabaltomolise.it/>

THE ECOSYSTEM SERVICES PARTNERSHIP

<http://www.es-partnership.org/esp>

UNESCO – MAN AND BIOSPHERE PROGRAM

www.unesco.org/mab

Conclusions

The thesis work here presented wanted to explore the link between the community engagement and the ES assessment as a potential tool for improving the decision-making process aimed at the landscape management, especially focused on the rural landscape.

The fragilities and potentialities of the rural landscape have been explored; to reduce the first ones and to valorize the second ones, it needs to consider the landscape as a whole, where the constant interactions between communities and ecosystems have to be managed in a balanced and integrated way. In the best cases, the regulatory systems like the protected areas' in general, and the rural district or the agricultural park in the specific, can give a chance for a better-structured framework in which potentialities can be developed in the rural landscape. However, the rules are not enough to make effective the management, because if stakeholders are not aware and involved enough in this regulatory system, it will not work well. Hence, the community engagement in the decision-making processes is a focal point on which the territorial policies should invest, because it enhances the quality of decisions and emphasizes the empowerment, equity, trust and learning finalized at the landscape management. In this direction, the education plays a key role in contributing to sensitize people's consciences and to lead them in understanding the importance of their own landscape resources. To reach this purpose, for instance, territorial projects inspired by the ES approach and carried out by implementing the principles and techniques of heritage interpretation can be realized by involving local communities and to make them in condition to attend at the decision-making processes.

By analyzing multiple case studies, the usefulness of the community engagement aimed at the landscape management has been evidenced: while it entails additional costs for the decision makers in terms of making available time, money, material and human resources, its worthiness is indisputable for the effectiveness of the process results. However, only if the community engagement is carried out in an integrative, multidisciplinary and systematic way and is considered as a mean, not as an aim, it can

really make the difference. Thus, it is more a matter of quality rather than a choice of implementing the community engagement or not in the decision-making process.

The several case studies analyzed also have highlighted the wide variety of modalities and approaches to be used for involving the local communities with the aim of investigating stakeholders' needs and perspectives about their own landscape. However, some points are recurrent, such as the importance of letting emerge stakeholder's values and identity characters, and keeping the participation effort close to the people's experiences for guaranteeing a more active involvement, shared decisional processes and, as consequence, more effective results.

Because the concept of landscape implies a comprehensive vision of characters, functions and human-nature interrelations, the ES assessment has been identified as useful approach to quantify and qualify such knowledges that have to be included in the landscape planning. Indeed, this approach allows investigating the biophysical, economic and socio-cultural aspects by considering the sources, the flows and the beneficiaries of the services generated by landscape ecosystems. As it has been underlined in the thesis, while the wide science attention has been always concentrated mostly on the biophysical and economic domains of ES, more efforts need to be focused on the socio-cultural branch, especially by investigating people's perception of ES, through which it is possible to analyze community's needs and perspectives regarding a certain landscape that are useful in the decision-making process. That is why a special attention of this work has gone towards this issue.

From these arguments, the "twofold approach" has been developed and presented as a theoretical and ideal method for linking the community engagement and the ES assessment in the perspective of the rural landscape management and, according to the analyzed literature, the strength points should be: the combination of objective and subjective data set concerning a certain landscape for having a wide body of knowledge; the inclusiveness and interchange of expert and local knowledge in both the objective and subjective paths; the participatory process to be included since the beginning of the planning strategy; the flexible applicability of this approach to every decision-making process that implies the landscape management. Instead, the weakness points should be:

the potential high costs of dealing with each one of those steps in terms of time, materials and human resources; the difficulties to get together the experts and local communities for obtaining quality results (often people are skeptical that their contribution really helps the process, as it has been mentioned in the chapter 2); the general complexity to manage this wide approach all along the process.

By applying the “twofold approach” at the case of Collemeluccio-Montedimezzo Alto Molise BR, some positive points can be identified. First of all, it has allowed having investigated an aspect that is usually neglected in the ES field, which is the beneficiaries’ perception. It has uncovered some interesting results useful for the future decision-making processes aimed at the BR landscape management, for instance the quite low awareness of the regulating ES by the BR’s stakeholders respect to the general high perception of providing and cultural ES. This observation suggests that the regulating ES are more difficult to identify by stakeholders involved in the study, thus, in a future perspective and in educational terms, it can be thought to stress this result by organizing actions and initiatives aimed at sensitizing the local community just about the regulating functions that the BR ecosystems absolve.

Moreover, in terms of results, the investigation of ES perception have indicated in general terms: a high perception of forests and semi-natural areas in the BR landscape for provisioning and cultural ES; a good perception of agricultural areas for provisioning ES, but not high for regulating and cultural ES; a good perception of urban surfaces mostly for cultural ES. By relating these first general results with the data already available for the BR (which means to link the subjective and the objective data according to the “twofold approach”), it is possible to explore some guidelines useful for the future management of the BR landscape, at which this present study would like to contribute. For instance, the applicative case has evidenced that beyond some “touristic hotspots” like Montedimezzo forest and the archeological site in Pietrabbondante (as it has been shown in the paragraph 4.1), it needs to improve the rural tourism in the area by better connecting the accommodation facilities (such as the B&B, agriturismo, etc.) with the opportunity of fruition, potentially offered by the rural landscape of the surrounding (for example, with recreational activities for adults and children, sporting and cultural events, etc.).

Instead, in terms of limitations of the “twofold approach” application in this research, one is the partial execution of the methodology. Indeed, while the approach proposed recommends the activation of the subjective and the objective paths in a participative way as much as possible, the applicative case shows mostly the subjective one, assuming that the objective branch of data of the BR was sufficiently already acquired for developing the future steps of its landscape management.

However, this limit can be seen also as a methodological opportunity, because, in some way, the “twofold approach” can be also applied partially whereas some steps of the approach have been already carried out and so, this expresses its character of flexibility (in addition, the approach has been developed also with this intention).

In terms of participation and community engagement, it needs to be noticed that in the objective path the interchange amongst the expert and local knowledge lacks, and this represents another limitation in the application of the twofold approach at the Collemeluccio-Montedimezzo Alto Molise BR. Moreover, in reference of the subjective path, the community engagement has been carried out in an indirect way, because stakeholders’ opinions and thoughts regarding the ES perception of the BR landscape have been collected and, then, processed as an additional body of knowledge with the expert one. Therefore, in this specific case, the important exchange between experts and stakeholders has lacked (or has partially lacked, if considering the interactions of the interviewees with the researchers who carried out the interviews). Notwithstanding that, the indirect participative modality has allowed reaching the purpose of understand people’s visions and values of the ES of their landscape.

The investigation of the ES perception in the BR landscape has been just a first attempt for applying a part of the “twofold approach” for increasing the subjective data set, and to link that with the objective data. Both the approach elaborated and the specific research in the BR might be worthy to be deepened and improved in the future, because they can be useful tools for increasing the knowledge aimed at implementing a more effective landscape management in a multidisciplinary and integrated framework.

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