

Sustainable rural development: The role of traditional activities in Central Italy



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ABSTRACT

Traditional farming systems and other activities such as craftsmanship (e.g. manufacturing activities, local food production), represent a sustainable example of human integration with nature. Their maintenance and development, with opportune adaptations to the current socio-economic situation and cultural/technological advancements, are therefore valuable. Under the new Common Agricultural Policy (CAP), preference will be given to projects with a participative approach presented for funding covered by the Common Strategic Framework 2014–2020 programming. The challenge is to integrate participatory planning, people's attitude to traditional work with the European strategy for rural development. LEADER actions are an effective tool suitable for the implementation of such local development policies.

In this paper, a ground-breaking attitude model to traditional activities has been developed. A questionnaire was compiled on the basis of current literature on attitude models and distributed to the community of a rural area in Central Italy (six municipalities). The data gathered were statistically analysed by structural equation modelling (SEM). The results obtained allow several factors influencing attitude to be identified as well as highlighting the difference in the responses of farmers and artisans compared with those of the rest of the community.

In addition, several strategies (leverage points) have been defined for an efficient rural development of the study area in line with peoples' perception. Such strategies would be capable of strengthening residents' sense of place and transforming the local community into a more resilient and adaptive socio-ecological system, capable in turn of ensuring and preserving the ecosystem services provided. Specifically, all the suggested actions aim to increase cohesion among citizens and institutions, to strengthen the sense of community and to promote the creation of local networks, an essential prerequisite to the setting up of Local Action Groups, as programmed by the European Strategy for Rural Development.

The novelty of the work lies in the use of SEM for the definition of leverage points, following Meadows' classification proposed within systems theory (Meadows, 2009).

This paper, by focusing on local traditional activities as a leverage point, puts forward recommendations for planners and policy makers, and opens a different perspective on today's increased need for rural re-development and social innovation.

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1. Introduction

Rural areas are places where traditions, cultural heritages and nature are intricately interwoven in a fragile equilibrium which is often metastable (Antrop, 2005; Gobattoni et al., 2011; Pelorosso et al., 2011). Indeed, rural landscapes can maintain their identity, self-stabilization and organization capacity only over a limited

range of perturbations, and they may eventually undergo significant alterations if socio-ecological conditions continue to change. Agriculture has long been, and still is, one of the main driving forces shaping landscape; however, since the 1950s, the role played by the agricultural sector in society has considerably changed as a consequence of mechanization and technological advances, globalisation processes and new social needs (Randelli et al., 2014; Van Eupen et al., 2012). In post-war Europe, industrialization and new demographic trends have led to the Urbanization phenomenon (Schewenius et al., 2014) with the rapid growth of cities, soil sealing through increased building and the depopulation of rural areas (Crafts and Toniolo, 1996). Crop intensification in productive

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and fertile regions has been observed while the depopulation and abandonment of marginal rural areas have become ever more evident (Crafts and Toniolo, 1996; Pelorosso et al., 2009; Pelorosso et al., 2011). The profound transformations experienced by agriculture have impacted not only on rural community economy, employment and social dynamics, but also on nature and the environment (Schouten et al., 2013; Hanley et al., 2012; McManus et al., 2012) and, in general, on the supply of so-called ecosystem and landscape services (De Groot et al., 2010; Hermann et al., 2011; Zanten et al., 2014). Taking into consideration the ecosystem services classification of millennium ecosystem assessment (MEA, 2003), these transformation processes have provoked heavy consequences on regulating services (e.g. worsening air quality and increasing hydrogeological risk), supporting (e.g. reduction in habitat) and provisioning services (e.g. the disappearance of traditional food and loss of forest productivity). The impact has also been felt on cultural services in terms of the loss of opportunities for tourism and recreational activities, reduction of aesthetic value of landscapes as loss of natural scenery and of appreciable “greenness” features (Zanten et al., 2014).

As a consequence, many cultural heritages are at risk and social systems can be forced into undesirable and quite sudden changes. Typical farming systems and other activities handed down and practised in the past (e.g. artisanship, including for example, wood processing, iron works, cheese-making or wine production) may then disappear.

Traditional work activities, such as extensive agriculture or craftsmanship (e.g. hand-made decorative objects and food production), have usually been characterized by a low level of natural resources exploitation and by a high regard for the innate vocation (e.g. farming, pasture) and specificity (e.g. climate, geomorphology, soil fertility) of a territory: for these activities, the use (and re-use) of wastes and local resources allowed a dynamic and resilient landscape to be constructed, where productive cycles were closed and the social and environmental capitals were conserved (Leone et al., 2014). Traditionally, work activities were better integrated with nature. Their processes were connected with environmental systems interacting functionally with them in a dynamic equilibrium and producing a perceived beautiful and harmonic landscape, as a result of the integration between human activities and nature, as stated in the *Florence European Convention on Landscape* (Council of Europe, 2000).

The interplay of anthropic and natural components is at the basis of the concept of sustainability, in which different dimensions act: social, economic, environmental and institutional aspects interlink contributing to the complex mechanisms that lie behind sustainable development (Valentin and Spangenberg, 2000). Thus, today, the preservation of traditional and landscape-linked activities, with opportune adaptations to the current socio-economic situation, cultural/technological advancements and environmental changes, should be one of the main issues taken into consideration in policy and territorial management.

To deal with the need for sustainable development, a multidisciplinary integration is compellingly required (Zurlini et al., 2013) with an approach that should reinforce the social and human capital while improving economic success (Costanza et al., 2009).

High levels of social capital within a community enable people to coordinate their activities with the aim of achieving mutual benefits, increasing social cohesion and mitigating opportunistic behaviours. In this view, understanding the relationships that local populations have with the place where they live and how they perceive it, appears of fundamental importance for the definition of effective strategies towards collective outcomes and common goals. The different relationships that populations have with the landscape, and the different values attributed to the landscape, influence the practices and activities that are shaping the land-

scape (Leone et al., 2014). The attitude of a community towards traditional activities may therefore be a fundamental factor in the effectiveness of landscape management strategies. Attitude, as defined by Ajzen (2001) is an evaluative judgement of an object that can be considered as good–bad, harmful–beneficial, pleasant–unpleasant, likeable–dislikeable: this judgement is based on the subjective beliefs we form about that object, but it is also influenced by feeling states and emotions (Agarwal and Malhotra, 2005). Attitude is affected by the socio-economic context in which people live and, at the same time, attitudes are significant for understanding and predicting social behaviour (Ajzen, 2001). To this aim, it becomes really useful to understand the attitude of a community towards traditional activities in order to discern the drivers that guide people's choices in remaining in the place where they live and in adopting a sustainable life style.

Several attitude models have been developed in social psychology and applied in research on environmental resources (e.g. Ko and Stewart, 2002; Larson and Santelmann, 2007). Eagly and Chaiken (1993) propose a well-known tripartite model based on a cognitive, an affective and a behavioural factor to explain attitude as a key influence of behaviour (Ajzen, 2001; Ajzen and Fishbein, 2011). The cognitive factor concerns rational evaluation of an object on the basis of its attributes, the affective component is related to an individual's feelings about an object while the behavioural factor is linked to past behaviours triggered by an object and/or in relation to the object itself. Baur et al. (2013) applied this tripartite model in Portland, Oregon to examine, users' and nonusers' attitudes to city nature parks. However, to the authors' knowledge, attitude to traditional activities in a rural community has never been studied.

A close scrutiny of rural communities' perceptions about their territory is, therefore, the first and essential step for identifying the territorial potential of rural areas and to identify the most effective actions for maintaining their natural and cultural capitals and, at the same time, promoting social innovation, for example, by changing unsustainable behaviours and removing structural constraints. However, these rural settings are nested in environmental and also political and economic contexts, which influence and impact the final success of any development strategy (Trabalzi and De Rosa, 2012). As De Snoo et al. (2013) report, only an enduring change in farmers' motivation and habits towards more sustainable actions can counteract the loss of biodiversity and landscape quality.

The challenge is therefore to start virtuous mechanisms to initiate rural communities into a more economically and socially sustainable development focusing on the combination of different kinds of knowledge. The latter should be gleaned not only from experts but also from local actors, in order to identify and implement opportune strategies of intervention and collective actions that could be accepted by farmers and citizens and integrated into their daily behaviour. Thus, the maintenance and development of traditional farming systems and other activities such as craftsmanship, adapted to the actual socio-economic, cultural/technological and environmental conditions are clearly valuable.

Under the new Common Agricultural Policy (CAP), preference will be given to projects with a participative approach presented for funding covered by the Common Strategic Framework 2014–2020 programming. The LEADER approach, second pillar of the Common Agricultural Policy since 2003 is based on a participatory approach and on the involvement of local partnerships – between entrepreneurs, institutions and the voluntary sector – forming a Local Action Group (LAG) as a kind of a public–private partnership in order to design and implement Local Development Strategies (LDS).

The challenge is to integrate participatory planning, people's attitude to traditional work with the European strategy for rural development. LEADER actions are an effective tool suitable for the implementation of such local development policies. However, iden-

tifying which amongst the many proposals would be the most adequate actions to realize is not a simple issue. Successful actions increasing social capital, and in general supporting a sustainable development, in complex and dynamical social–ecological systems, as rural landscapes are, can be defined referring to the leverage points classification proposed by Meadows (2009) within the systems theory. According to Meadows (2009), opportune leverage points can be identified in a complex system as places where a small change in one thing can generate big modifications in the whole system's behaviour. She identifies a list of twelve points corresponding to twelve typologies of leverage points from the least effective (constants, parameters, numbers) to the most effective one (the power to transcend paradigms). In particular, leverage points can be detected at the level of parameters characterizing the system, of negative feedback loops (self-correcting), of positive feedback loops (self-reinforcing), of rules for self-organizing, and at the level of goals of the system.

The main aim of this paper is to present a methodology to define opportune leverage points in a rural community, enhancing people's attitude to traditional forms of work in order to increase the social capital and to trigger virtuous feedback towards a durable sustainable development. The novelty of the method lies in the formulation of a model of attitudes towards traditional activities, and its subsequent employment for the identification of social leverage points following the Meadows scheme. Following this, a discussion of such strategies in the context of LEADER actions is presented. The method was applied in a rural district of Central Italy where a Local Action Group is already active and the agriculture and natural areas still characterize the identity of the landscapes and the communities.

As Carolan (2008) argues in a study on the countryside perception among resident farmers and non-farmers, physical interaction (embodied experience) with the landscape shapes the understanding of the surrounding environment. Different groups of people dwelling in a place could therefore exhibit different attitude towards traditional activities because of their engagements (e.g. job) within the landscape. These differences should be investigated in order to identify the actions able to reduce the (socio-cultural) conflicts of the rural areas (Carolan, 2008).

To accomplish the main goal of the paper, we addressed three specific questions:

1. What is the relative influence of different factors on residents' attitudes to agriculture and craftsmanship?
2. Are there differences between farmers and nonfarmers, artisans and nonartisans in the factors influencing attitude to traditional activities?
3. Is it possible to identify opportune leverage points following Meadows definition and efficiency classification (Meadows, 2009) to awaken communities' interest and involvement in the activities that have always characterized and shaped the landscape of the area under investigation?

Two introductory paragraphs describe in depth the LEADER approach (Section 2) and the study case of Teverina Consortium (Section 3).

2. The LEADER approach: The European strategy for rural development

As stated by the Rural Development Programmes, planning processes should be conceived as 'integrated development strategies', aiming at a territorial development that takes into account the strengths, weaknesses, and opportunities of a region (Pollermann et al., 2013; Terluin, 2003).

The LEADER approach is based on guiding principles aimed at supporting the EU's rural development policy by "improving the quality of life in rural areas and encouraging diversification of economic activity" (Council Regulation (EC) No 1698/2005 of 20 September 2005 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD)).

Based on local resources, LEADER represents an opportunity of enhancing regional identity (Pollermann et al., 2013; Williams and Stewart, 1998), it is related to concepts such as the sense of belonging to a community and participation in decision making (High and Nemes, 2007). In this context, a successful combination of innovation, organisation and territory appears crucial (Dargan and Shucksmith, 2008; Storper, 1995). As Markusen and Venables (2000) underline, it is not enough to bring stakeholders together in a given geographical space. The creation and development of networks for their interaction become essential: networks of local actors are strategic in allocating resources (endogenous and exogenous) for the development and implementation of innovation projects in rural areas (Esparcia, 2014). Thus, the strength of the partnership between local actors influences the impact of support actions on rural development (Esparcia, 2014; Wellbrock et al., 2012).

As Trabalzi and De Rosa (2012) underline, growth in rural areas strictly depends on the quality of the local institutional structure and on its capacity to reinvent and rearrange economic choices if needed. Therefore, the success of LEADER initiatives rests largely on the social context: the French territorial organization, characterized by supra-municipal regrouping (e.g. Contrat de Pays), appears particularly suited for the "bottom-up" approach (Buller, 2000) while, in southern Italy, the low solidarity and a high mistrust among public and private agencies have been associated with an inefficient investment of financial resources (Osti, 2000). On the other hand, corporatism, political pressure and opportunism among the involved actors can compromise the capacity of innovation and co-ordination in the actions necessary to reach a sustainable rural development (Trabalzi and De Rosa, 2012). Fundamental characteristics of a strong institutional network are adaptability (i.e. the ability to change when external or internal conditions change using the means available), resilience (i.e. the ability to adjust its organization under internal or external forces in order to remain competitive) and self-organization, (i.e. the ability to create new structures and behaviours) (Meadows, 2009; Trabalzi and De Rosa, 2012). Meadows (2009) suggests that intervening on the "rules for self-organization" of a complex system is one of the most effective leverage points. Since institutional environments are complex and dynamic social systems whose behaviour and evolution are extremely difficult to predict (Trabalzi and De Rosa, 2012), the identification of actions able to trigger self-organization and adaptation could lead to the achievement of concrete objectives using the available means.

Moreover, rural areas are often characterized by a scarce availability of physical, human and financial resources (Esparcia, 2014), which may lead to two major obstacles to LEADER success, the first being an absence of cohesion and strong social capital in some communities. The second potential obstacle is much more general, and arises from the current lower availability of financial resources, which impedes the implementation of innovation and increases difficulties in access to credit for both farmers and entrepreneurs, as a consequence of the financial crisis and of the global banking collapse that has been defined as the longest and deepest recession of the post-war period (Murphy and Scott, 2014).

The new CAP places greater emphasis on a participative approach, as espoused by LEADER, for the allotment of funds covered by the Common Strategic Framework for the programming period 2014–2020 (Reg. UE 1305/2013). Thus, despite the above-

mentioned limitations, LEADER has been recognized over the last twenty years as a potentially effective tool for the implementation of development strategies.

In this context, the identification of leverage points from which to drive a social–ecological system towards a sustainable rural development could help to encourage the implementation of LEADER actions and also to support their success. The activation of a path, although slow, towards a long-term sustainability could contribute to make a rural community much more aware of the development opportunities for their area, among which the LEADER programme is one.

This process could lead to a much more cohesive and aggregated rural community, and guide it in the definition and, above all in the achievement, of collective goals and objectives.

3. A rural context in Central Italy: “Teverina Consortium”

The Teverina Consortium is a supra-municipal body covering six territorial entities of the north-eastern part of the Province of Viterbo known collectively as the “Tuscia” area, located in the Lazio Region (Central Italy); it includes the municipalities of Bagnoregio, Castiglione in Teverina, Celleno, Civitella d’Agliano, Graffignano, and Lubriano (Fig. 1). This area, steeped in history, boasts traces of civilisation dating back to the Etruscan period and beyond, to the Stone Age. The Teverina Consortium area today has a total population of about 13,000 inhabitants, and covers approximately 196 km². It forms a single natural sub-region with homogeneity of soil and climate, the sixth sub-geographical region in Lazio (i.e. the sixth phytoclimatic unit), according to Blasi’s phytoclimatic classification (Blasi, 1994). In this sub-region, the natural annual rainfall is moderate to high (954–1166 mm) with single events averaging between 100 and 160 mm.

Agro-forestry is the main element characterizing the landscape of this area (Fig. 1).

The agricultural landscape configuration in this portion of “Tuscia” is tied to the system of ancient traditions such as grazing, grain–crop production, vineyards, olive groves and forest management. Areas of great natural interest, such as the Site of Community Interest and Special Protection Area (SCI–SPA) “Calanchi di Civita di Bagnoregio” and the SCI–SPA “Monti Vulsini” fall within the Teverina Consortium.

This rural context is also characterized by the production of quality wines, with the presence of Controlled Designation of Origin (C.D.O.) and Typical Geographical Indication (T.G.I.) crops (see Table 1). According to data available from the Viterbo Province Chamber of Commerce (Teverina Local Action Group, 2013), the production of quality wines involves the majority of utilized agricultural area (UAA) devoted to vineyards of which about 37% is dedicated to G.T.I. vine crops and 61% is reserved for C.D.O. vine crops.

On the basis of agricultural censuses conducted by the Italian National Statistics Institute (ISTAT, 2000, 2010) reported in Tables 1 and 2, the number of farms active within the municipalities of the Teverina Consortium declined from 3000, by about two thirds between 1960 and 2010. In particular, it is interesting to note there were two phases of decline, the first occurred between 1960 and 1970, while a second slow contraction started in 1990 leaving only 1049 active farms by 2010. In spite of a huge decrease in the number of farms, the total agricultural area (TAA) shows a reduction of only about 1200 ha (8%) over 10 years (2000–2010), while the utilized agricultural area (UAA) dedicated to organic farming increased by 49% and the UAA for products of excellence more than doubled (Table 2).

Moreover, analysing the data available from the population census conducted by the Italian National Statistics Institute (ISTAT,

2001, 2011), we can assume that the changes occurring in rural settlement patterns (2000–2010) did not have a great impact from an occupational point of view in the Teverina Consortium since the number of people employed in the agricultural sector increased by 4.68% between 2001 and 2011 (Table 3). Specifically, in the six municipalities of the Teverina Consortium, the total number of people employed in all sectors rose, while the percentage of people working in agriculture, calculated on the total number of people occupied, decreased slightly from 10.8% of 2001 to 9.8% of 2011.

These trends confirm the rural vocation of the area, which is still basing its economy on agricultural activities. Moreover, the naturalistic, historical and cultural attractions (e.g. churches, ancient medieval villages, SCI–SPA sites) still present in the landscape together with the quality of its agricultural products, make it a fascinating if not yet well known rural territory, with a potential for attracting rural tourism as great as that in Tuscany. However, in recent years, the changing role of agriculture and the consequences of the widespread financial crisis suffered by the European and world economies has a wide ranging effect on the economic and social texture of the area. Specifically, in the recent period of economic recession, the whole Italian productive system has been experiencing radical changes in the behaviour of consumers and businesses, exerting strong pressure on public finance and limiting the action of the economic policy.

The area is also characterized by the presence of local traditional activities typical of craftsmanship essentially related to food production (e.g. honey, cheese, olive oil, wine, jam, liqueur and other products derived from cherries) and hand-made decorative objects (e.g. wood carving, terracotta hand-work, wicker baskets).

In this context, the main objective of the Teverina Local Action Group (LAG) is to support a widespread growth in farm multifunctionality, giving farmers opportunities to diversify their income. The local economy of the area has directly experienced the consequences of a crisis that exposes farmers to a series of negative effects. First of all, is the instability of prices which in turn has affected the implementation of the Local Development Plan (Teverina Local Action Group, 2013), causing operational difficulties for the realization of investments. In the case of investment measures, the beneficiary must cover a significant portion of the initiative either with its own resources or through access to credit. The same problem has also been experienced by the public beneficiaries who, although they are co-financing a more limited part of the investment, often have to deal with inconsistent budgets and cuts in government funding. Agriculture represents an important source of income for the municipalities included in the Teverina LAG but the heavy reductions in income associated with rural activities impose urgent intervention strategies for successful rural development. These strategies need to be seen as useful by farmers, accepted by them and must be feasible with respect to the context the farmers live in.

4. Methods

To pursue the objectives defined by the three research questions, a questionnaire was compiled on the basis of current literature on attitude models (see Section 4.1); subsequently, the questionnaire was distributed to the population of the Teverina Consortium (Section 4.2). The data gathered were statistically analysed by structural equation modelling (SEM), taking into account both the entire sample and a reduced sample representing farmers and artisans (Section 4.3). The attitude models for both, i.e. that regarding farmers and artisans and that regarding the rest of the sample were compared in order to investigate how different components influence the attitude of each group. Finally, several possible actions for social innovation having as a reference the leverage point classifi-

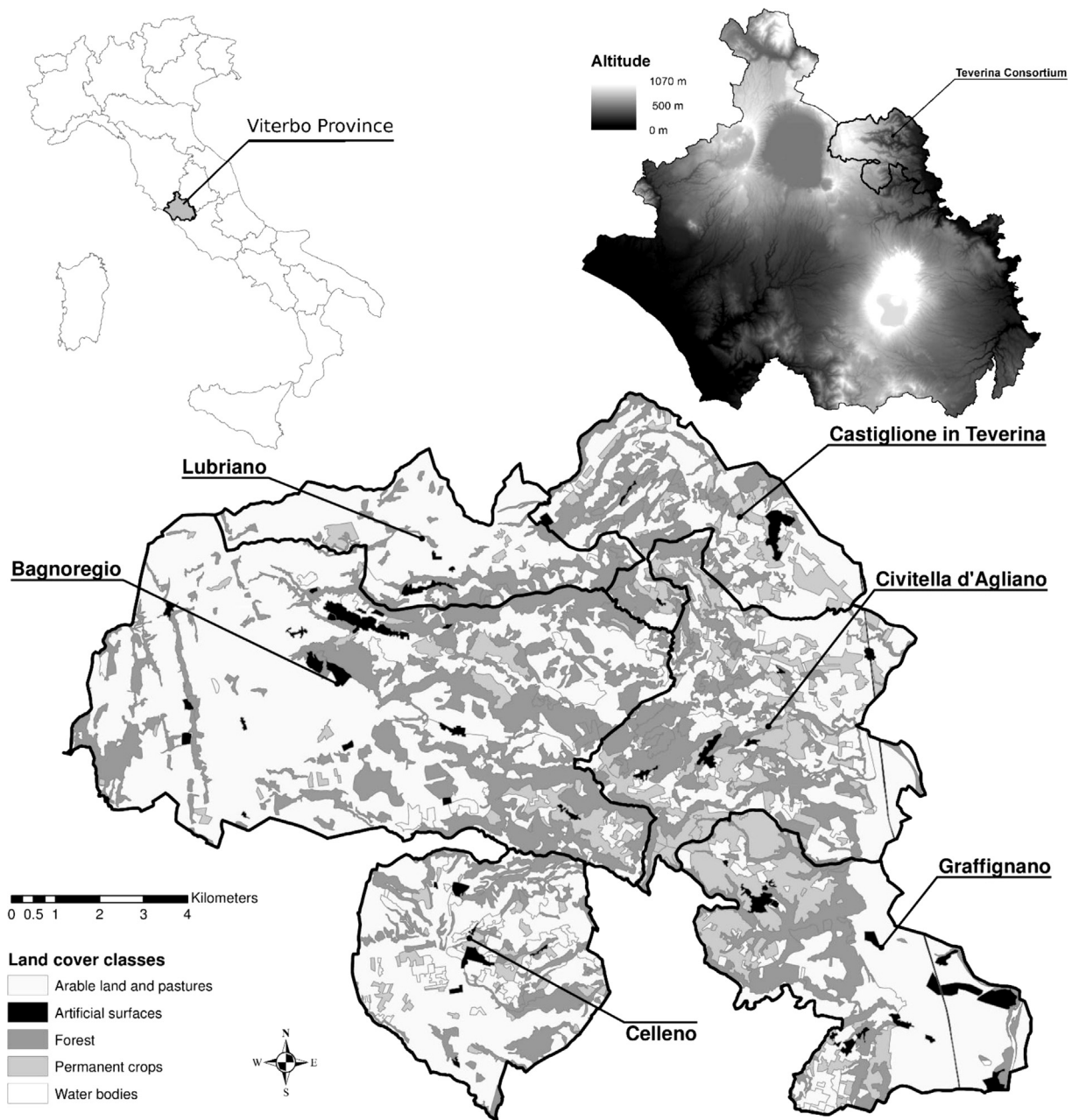


Fig. 1. Study area. The six Municipalities included in the Teverina Consortium rural district.

cation by Meadows (2009) and the elaborated SEMs (Section 4.4) were pinpointed.

4.1. Attitude model components

To create the attitude model, we developed survey items based on three groups of studies from the literature: those implementing a tripartite model (Baur et al., 2013), those conducted to investigate the relationships between people and spatial settings (Lewicka, 2005; Raymond et al., 2010), and those exploring rural landscape perceptions (Natori and Chenoweth, 2008; Rogge et al., 2007).

A plethora of terms exists and appears in environmental psychology and social science literature to describe human–environment relationships: it includes place attachment (Lewicka, 2011; Altman and Low, 1992), place identity (Proshansky et al., 1983), place dependence (Stokols and Shumaker, 1981),

community attachment (Perkins and Long, 2002), neighbourhood attachment (Lewicka, 2005, 2011) and bonds to nature (Gosling and Williams, 2010) but the most generic of them is perhaps the concept of sense of place (Jorgensen and Stedman, 2001). Sense of place can be referred to as an overarching concept which incorporates other concepts representing the relationships between people and their spatial settings (Jorgensen and Stedman, 2001); it can thus be seen as a multidimensional construct incorporating beliefs, emotions and behaviours concerning a particular geographic setting (Jorgensen and Stedman, 2006). In this view, we decided to develop a set of questions to be connected to the sense of place of each respondent.

Concerning issues related to the affective component, special attention is due to the controversial interpretation of place attachment: in the majority of publications devoted to this concept, it is assumed to be implicitly defined as a positive attribute, which pro-

Table 1
Data from agricultural censuses conducted in 2000 by the Italian National Statistics Institute.

Year 2000					
Municipality	Total number of farms	TAA (ha)	UAA (ha)	UAA Organic (ha)	UAA C.D.O. T.G.I. (ha)
Bagnoregio	455	5 006.21	3 589.24		
Castiglione in Teverina	241	2 203.93	1 619.05		
Celleno	273	2 058.77	1 675.40		
Civitella d'Agliano	555	2 752.99	1 965.32		
Graffignano	397	1 215.26	1 036.70		
Lubriano	181	1 583.84	1 105.69		
Total	2102	14 821.00	10 991.40	1 078.67	1 129.33

TAA = total agricultural area; UAA = utilised agricultural area.

Table 2
Data from agricultural censuses conducted in 2010 by the Italian National Statistics Institute.

Year 2010					
Municipality	Total number of farms	TAA (ha)	UAA (ha)	UAA Organic(ha)	UAA C.D.O. T.G.I. (ha)
Bagnoregio	288	5 757.70	4 053.88	836.5	679.41
Castiglione in Teverina	106	1 422.00	1 099.89	254.05	789.46
Celleno	141	1 916.49	1 572.35	123.48	597.79
Civitella d'Agliano	216	2 112.90	1 572.12	277.43	600.91
Graffignano	222	1 493.60	1 112.11	24.63	24.63
Lubriano	76	897.89	744.60	92.63	443.29
Total	1049	13 600.58	10 154.95	1 608.72	3 135.49

TAA = total agricultural area; UAA = utilised agricultural area.

Table 3
Number of people employed in agriculture, expressed also as a percentage of the total number of people in employment for each municipality of Teverina Consortium.

Year 2001			
Municipality	Total number in employment	Number employed in agriculture	Percentage (%)
Bagnoregio	1214	125	10.30
Castiglione in Teverina	797	105	13.17
Celleno	480	53	11.04
Civitella d'Agliano	490	58	11.84
Graffignano	664	40	6.02
Lubriano	302	46	15.23
Total	3947	427	10.82
Year 2011			
Municipality	Total number in employment	Number employed in agriculture	Percentage (%)
Bagnoregio	1404	120	8.55
Castiglione in Teverina	912	108	11.84
Celleno	540	59	10.93
Civitella d'Agliano	566	57	10.07
Graffignano	792	52	6.57
Lubriano	349	51	14.61
Total	4563	447	9.80

duces beneficial effects for individuals and communities (Lewicka, 2005). In most of the available scientific papers, place attachment is considered a good thing, directly related with human identity (Jorgensen and Stedman, 2001; Stedman, 2002; Stewart et al., 2004), a defence against identity crises as Hay (1998) suggested. Place attachment can positively influence civic activity and sustainable behaviours (Kyle et al., 2004; Uzzell et al., 2002). On the other hand, Lewicka (2005) questions the direct and positive relationship between place attachment and civic participation. She also cited other studies that question the unconditional attribution of a positive meaning to place attachment, e.g. the work carried out by Fried (2000) who argues that place attachment may be a factor that inhibits individual progress and mobility.

Given the context, we decided to test participants' integration in a modern society characterized by multi-ethnic and multicultural exchanges. When all the different cultures and communities coexist harmoniously, civic and emotional bonds grow up between citizens, realizing "horizontal associations" (Putnam et al., 1994)

among people (e.g. networks of civic engagement) that increase the social capital with an effect on productivity. We therefore asked respondents their opinion about encouraging foreign people to integrate into their community, about support for equal opportunities for all citizens and whether they were interested in participation in planning processes.

Different kinds of relationships between people and their territory lead to different perceptions of the territory and different approaches to landscape in general and rural landscape in particular: the link between us and the landscape directly influences our perception of it and the way we perceive the landscape directly affects the way we act on landscape, the decisions we take about its management and development.

An important positive predictor for landscape preference seems to be the degree to which a particular scene is perceived as "natural" (Coeterier, 1996; Herzog et al., 2000; Scott, 2002) where the concept of naturalness is generally related to the presence of vegetation and the presence of human-induced changes in a landscape

(e.g. by agriculture, natural resources exploitation, urbanization phenomena). Several studies have also underlined that the degree and modalities of landscape maintenance represent another powerful predictor for preference (Van den Berg and Koole, 2006; Scott, 2002), for example, farmers aesthetically prefer well managed landscapes while displaying low preferences for wild natural landscapes (Van den Berg and Koole, 2006). Moreover, the more homogeneous a rural landscape, the lower is its perceived quality (Arriaza et al., 2004).

To investigate whether and how the “natural landscape” can influence people’s choices and life style, we introduced a few items exploring that could be defined as the “ecological vision” of an individual.

The way we see and understand the landscape is influenced by our state of mind, by functional links with the landscape itself and by our social habits and value judgements grounded on our culture (Buijs et al., 2006; Fjellstad et al., 2009; Haines-Young et al., 2006; Lyons, 1983; Tempesta, 2010).

Perception is the image in our brain representing the outside world, to form this image, our brain selects only some information to build a consistent image in a process of selection which is strictly determined by our culture. The image may fail to be clear and significant if we fail to process all the information coming from the outside world (Coeterier, 1996; Tempesta, 2010).

Moreover, perception of the landscape has an influence on behaviour (Rimbert, 1973), choices, actions, and changes in land management. The ways in which landscape is perceived and how landscape is shaped are interdependent: people continuously interact with the surrounding territory in a cycle where the landscape influences human perception which may in turn condition how people act on the landscape (Natori and Chenoweth, 2008; Tress and Tress, 2001).

Perception, therefore, is the key to integrating human activities and the land (Stenseke, 2009), the use and protection of natural resources, and to finding a balance between economic development and environmental sustainability.

On the basis of these considerations, we asked respondents about the perceived positive or negative impacts of different activities on landscape and about the existence, according to their knowledge, of product certification systems in the territory they live in (e.g. Controlled Designation of Origin, Typical Geographical Indication, etc.). The analysis of the perceived outcomes of anthropic interventions by people together with data on their objective knowledge about landscape assets and characteristics (e.g. the quality certification systems applied to local products) could be considered a measure of the cognitive component which relates to the conscious and reasoned evaluation of an object made by an individual (Baur et al., 2013; Bright and Manfredi, 1996).

For all the items described above, we asked questions on a three-point scale from “1” (I strongly disagree) to “3” (I strongly agree). The aims of the work were to understand public attitudes to “local traditional” activities, such as agriculture and craftsmanship, and to reveal factors influencing these attitudes and the links between these factors. Due to the specific target of the research and to the peculiarity of the case study area, we had no pre-set scale or questionnaire, which we could use to model survey items. We therefore constructed them without a predefined example, while drawing on all the available scientific literature on the argument.

4.2. Data collection

The study followed a qualitative and quantitative approach through the creation and distribution of questionnaires to local communities. The questionnaire was structured on a common set of core items with additional specific questions for different kinds of user: residents, local administrators and officers, tourists. Appendix

A reports the complete list of the questions considered in the construction of the attitude models as reported in Section 4.3.

From the fall of 2011 until the spring of 2012, questionnaires were distributed individually to houses and farms, and at stores, markets, parks, schools and other social meeting places in each village using a ‘drop and collect’ procedure, involving repeated visits to personally drop off and later collect completed surveys. A total of 2100 questionnaires were distributed and 500 returned completed (a response rate of 24%).

Using a drop and collect method to administer questionnaires did return responses from a limited number of individuals, which cannot be a representative sample of the entire population of the study area. It is possible that, a larger portion of the Teverina Consortium residents could have been reached by email or by telephone interviews. However, the distribution among schools, institutions, shops and markets ensured a direct relationship with people, which gave us the opportunity to explain the motivations of this research after the subjects had compiled a questionnaire.

In this paper, we only present the results obtained from the elaboration of the collected data related to local communities (farmers and artisans and the whole sample).

4.3. Statistical analysis

The focus of our analysis was on social phenomena that are not directly observable. We therefore used structural equation modelling (SEM) to analyse the results obtained. SEM is an extension of several multivariate techniques, most notably factor analysis and multiple regression analysis: it can examine and test theories that contain multiple equations involving dependence relationships (Hair et al., 2009). In general, SEM is particularly useful for measuring latent (unobservable) variables allowing a system of variables to be tested simultaneously in order to estimate the best fitting model for any kind of observed data (Byrne, 2013). The implementation of a SEM allows a causal modelling or path analysis which hypothesizes causal relationships among variables to be obtained. These connections are expressed as positive or negative coefficient paths associated to straight arrows, leading from the explanatory (causal) variable to the outcome variable (effect) and, respectively, representing the sign (positive or negative) of the influence of a causal variable on the outcome variable. These models can involve either observed variables, latent variables, or both.

In literature, the SEM modelling approach has been used in psychological research (MacCallum and Austin, 2000; Lewicka, 2005), in ecology and evolutionary biology (Pugesek et al., 2003; Arhonditsis et al., 2006) and social sciences, e.g. to assess the drivers of sustainability at a global and national level (McKinney, 2014). Structural equation models have also been developed to examine attitudes towards urban nature parks (Baur et al., 2013) or residents’ attitudes towards tourism (Lindberg and Johnson, 1997).

In this paper, we used an SEM to construct an attitude model. Before the SEM, an exploratory factor analysis (EFA) was performed in SPSS, version 16, to ascertain whether the indicators we had developed were effectively representative of the underlying factors we expected to find as relevant. An exploratory factor analysis is a popular statistical technique in the social and behavioural sciences used to model latent factors: it allows the numbers of observed variables to be reduced, identifying a set of underlying constructs on which different groups of variables are “loaded” (Hair et al., 2009).

After the EFA, we constructed the structural equation modelling (Hair et al., 2009) using Amos (V.16), which is one of the most common software applications (Nachtigall et al., 2003). The Chi-square was used as a first fit index but since it is considered to be sensitive to sample size (Byrne, 2013), other fit indices such as root mean square error of approximation (RMSEA), goodness of fit index

(GFI), comparative fit index (CFI), normed fit index (NFI), incremental fit index (IFI), Tucker–Lewis index (TLI) were also included in the study. Values for GFI, CFI, NFI, TLI, IFI range from 0 to 1 and values closer to 1 indicate a good model fit (Byrne, 2013; Hair et al., 2009).

A reliability analysis based on Raykov's reliability rho (Raykov and Marcoulides, 2010) was then estimated to ensure the internal consistency of the scale of the chosen variables for each factor retained through the EFA and modelled by the SEM. In particular, to test the reliability of the constructs, we reported composite reliability (CR) and average variance extracted (AVE). CR estimates the extent to which a set of latent construct indicators share in their measurement of a construct, whilst, the AVE is the amount of common variance among latent construct indicators (Hair et al., 2009). Hair et al. (2009) recommend CR values above a 0.70 threshold. Like Cronbach's alpha, Raykov's rho (also known as reliability rho and composite reliability), ranges between zero and one: the higher its value, the more reliable the item scale. A value of rho above 0.8 indicates good internal consistency, while 0.7 represents the lower limit of adequacy (Cicchetti, 1994). AVE varies from 0 to 1, and it represents the ratio of the total variance that is due to the latent variable; according to Dillon and Goldstein (1984) and Bagozzi et al. (1991), a variance extracted of greater than 0.50 indicates that the validity of both the construct and the individual variables is high.

AVE was also used to assess whether discriminant validity existed or not (Fornell and Larcker, 1981): the method chosen to measure the discriminant validity was a comparison of AVE and shared variance of two or more factors. For discriminant validity, the value of AVE must be greater than the value of shared variance.

4.4. The identification of leverage points

As Senge (2006) underlines “small, well-focused actions can sometimes produce significant, enduring improvements, if they are in the right place”. These places are usually referred to as “leverage points.” Leverage points exist in all systems (e.g. an economy, a city or an ecosystem), but they are not so easy or intuitive to find (Meadows, 2009; Nguyen and Bosch, 2013). Definite rules to identify high-leverage points do not exist but trying to understand the underlying “structures” of a complex system is a starting point to make the finding of them more likely (Senge, 2006). The construction and validation of a significant causal diagram of a system are essential for the understanding of the cause–effect links between its hidden structures. It allows the leverage points of complex problems to be underlined so that adequate intervention strategies can be suggested (Maani and Cavana, 2007). Therefore, an understanding of the forces at play in the system allows areas of high- and low-leverage change to be identified, making it possible to plan how and where to intervene to obtain a system shifting. For the purposes of our research, we had recourse to structural equation modelling to represent and test the causal relationships among latent underlying structures (i.e. factors) influencing attitude towards traditional activities in the complex system analysed (i.e. the rural community of Teverina Consortium). Examining these causal relationships, corresponding to the positive and negative links (positive or negative causal influence) between variables, opportune leverage points was derived which may help to move people towards a sustainable rural development based on traditional activities. In particular, weak or negative connections between factors suggested the right places to intervene, the actions to be supported and implemented as leverage points in the rural community examined.

Finally, each leverage point was placed in the Meadows classification, identifying twelve positions, from 12 to 1, in increasing order of effectiveness: i.e. greater position numbers correspond to low effectiveness leverage points, while smaller position numbers represent the most efficient at changing complex

systems but also the most difficult to apply due to system resistance.

5. Results

Our sample ($N = 497$) consisted of 52.8% of women and 48.2% of men. 63.9% of the whole sample was represented by people fully engaged in traditional works: farmers were 49.6% of the sample, while 14.3% declared to own an artisan activity. Mean age of the respondents was 37 years.

To avoid problems with multicollinearity among the variables, we carried out a correlation analysis that allowed us to select the opportune set of indicators to analyse (Table 4).

We then conducted an exploratory factor analysis (EFA) on the whole sample that returned eight factors (Table 4) with a reduction of loading items from 40 to 21.

In accordance with Hair et al. (2009), the structure with eight components was accepted with 60.87% of explained variance, and variables with a factor loading greater than 0.3 were retained. One consequence of the low response was the exclusion of several variables, corresponding to items originally present in the questionnaire, from the EFA outcome since they did not show a high loading factor on any of the latent constructs returned by the analysis: a larger sample might have induced a greater stability in the factor analysis.

We constructed an initial SEM model and we then investigated modification indices, expected parameter change (EPC) values and residuals to understand whether the model could be improved.

The final fit indices for the improved model (Fig. 2) indicated that it was acceptable:

$$\chi^2 = 182.294; \text{GFI} = 0.959; \text{CFI} = 0.979; \text{df} = 172;$$

$$\text{TLI} = 0.974; \text{RMSEA} = 0.012; \text{NFI} = 0.740; \text{IFI} = 0.981.$$

The entire procedure, from correlation analysis to SEM model development through EFA, reliability analysis and discriminant validity assessment, was repeated on a partial sample representing only farmers and artisans ($N = 265$).

The final fit indices of this second model (Fig. 3) were: $\chi^2 = 193.083$; $\text{GFI} = 0.912$; $\text{CFI} = 0.898$; $\text{df} = 168$; $\text{TLI} = 0.872$; $\text{RMSEA} = 0.027$; $\text{NFI} = 0.576$; $\text{IFI} = 0.913$. These indices scores indicate that the model fits the data fairly well.

The reliability analysis revealed a satisfactory level of internal consistency (Tables 5 and 6) of the factor scales, by means of an estimation of the composite reliability, which can be defined as a measure of the overall reliability of a collection of heterogeneous but similar items (Fornell and Larcker, 1981).

The CR estimation was obtained through the calculation of Raykov's rho with reference both to the whole sample (Table 5) and to the reduced sample taking into account only farmers and artisans (Table 6).

As Tables 5 and 6 show, all the constructs have composite reliability scores exceeding the recommended value of 0.70 ensuring the internal consistency of the variables, at the same time, they have AVE scores greater than 0.50 indicating a high validity of the constructs and of the individual variables.

6. Discussion and implications

The general objective of this study was to conceptualize and empirically examine a model of attitude to local traditional activities (craftsmanship and agriculture) representative of the communities living in the Teverina Consortium municipalities. Our findings indicate that an eight-dimensional model of attitude comprising affective, knowledge and perceived outcome components

Table 4
Exploratory factor analysis for items loaded in attitude model factors developed from the whole sample ($n = 497$).

Item ^a	Factor loadings ^b							
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8
Impact of agriculture on landscape (X14)	0.846							
Impact of tourism on landscape (X15)	0.825							
Impact of commerce and services on landscape (X18)	0.777							
Impact of construction industry on socio-economic development (X22)		0.799						
Impact of industry on socio-economic development (X21)		0.778						
Impact of commerce and services on socio-economic development (X23)		0.568						
Impact of tourism on socio-economic development (X20)		0.516						
Environmental protection ensures a future to coming generations (X5)			0.901					
Environmental protection hides political and economic interests (X6)			0.892					
Rural activities represent your future and income (X29)				0.817				
Artisan activities represent your future and income (X30)				0.808				
In the municipality you live in, places deserve a visit (X10)					0.650			
Usually frequent these places (X11)					0.555			
Feel responsible for the health of the landscape you live in (X4)					0.532			
Traditions, local products and culture should be encouraged (X36)					0.418			
Have a feeling that the landscape you live in is in danger (X3)						0.758		
The environmental quality of the landscape you live in is conserved (X12)						0.753		
Know well the meaning of quality certification systems (X27)							0.741	
Know the quality certification systems applied to local products (X25)							0.729	
Integration of foreign people and equal opportunities for them should be encouraged (X34)								0.786
Participation in planning processes should be encouraged (X33)								0.693
Percent (%) of total variance explained	13.332	9.102	7.985	7.276	6.693	5.940	5.317	5.228
Cumulative percent (%) of variance explained	13.332	22.434	30.418	37.694	44.387	50.327	55.645	60.873

^a In parentheses variables' names used for the construction of SEM models.

^b Oblique factor rotation with Varimax method. Only factors having eigenvalue greater than one and factor loadings greater than 0.30 were retained (Hair et al. 2009).

Table 5
Reliability and discriminant validity analyses for attitude model factors (whole sample, $n = 497$). All items use a Likert scale from 1 = disagree to 3 = agree.

Factor	Variable	Mean	SD	CR	AVE	SMC
Perceived impacts on landscape	Impact of agriculture on landscape	1.43	0.585	0.9253	0.9553	0.5550
	Impact of tourism on landscape	1.46	0.609			0.5960
	Impact of commerce and services on landscape	1.44	0.593			0.5271
Perceived impacts on socio-economic system	Impact of construction industry on socio-economic development	1.27	0.525	0.8617	0.9726	0.6691
	Impact of industry on socio-economic development	1.27	0.525			0.6972
	Impact of commerce and services on socio-economic development	1.56	0.788			0.1109
Ecological world view	Impact of tourism on socio-economic development	2.41	0.802			0.1918
	Environmental protection ensures a future to coming generations	2.52	0.854	0.9346	0.9543	0.6512
	Environmental protection hides political and economic interests	1.75	0.968			0.6956
Attitude to traditional work	Rural activities represent your future and income	2.82	0.561	0.8062	0.8903	0.4147
	Artisan activities represent your future and income	1.67	0.940			0.4109
Sense of place	In the municipality you live in, places deserve a visit	2.82	0.561	0.4301	0.8149	0.1722
	Usually frequent these places	1.67	0.940			0.0676
	Feel responsible for the health of the landscape you live in	2.38	0.915			0.0645
Perceived environmental quality	Traditions, local products and culture should be encouraged	1.87	0.968			0.0625
	Have a feeling that the landscape you live in is in danger	1.87	0.898	0.7936	0.8675	0.3295
	The environmental quality of the landscape you live in is conserved	2.68	0.729			0.4720
Knowledge of quality systems	Know well the meaning of quality certification systems	1.77	0.903	0.5834	0.8127	0.2218
	Know the quality certification systems applied to local products	1.87	0.928			0.2190
Participation and integration	Integration of foreign people and equal opportunities for them should be encouraged	1.15	0.471	0.7121	0.8101	0.4914
	Participation in planning processes should be encouraged	1.39	0.760			0.1798

SD = standard deviation; CR = composite reliability (Raykov rho); AVE = average variance extracted; SMC = squared multiple correlations that correspond to the shared variance.

is a valid and reliable measure of community attitudes to local traditional activities. Exploratory factor analysis, reliability and discriminant validity analysis revealed that this model explained a great amount of variance. The same model turned out to be valid and reliable also for the portion of sample representing farmers and artisans thus allowing a comparison between the two models.

In response to research question #1, "What is the relative influence of different factors on residents' attitudes to agriculture and craftsmanship?" results from the SEM model developed for the entire sample (Fig. 2) underline a significant positive path between "Knowledge of quality systems" and "Attitude to traditional activities": people abreast of the actual certification systems of local products and with a specific knowledge about the territory have a positive attitude towards traditional activities, thus, revealing

the influence of cognitive factors, related to logical and reasoned evaluation of the territory, on attitude.

A community aware of products and production processes typical of its own culture has a feel for those activities based on local resources such as artisanship and agriculture. What people know about the landscape, its resources and traditions, directly influences what people perceive and this perception, in a recursive loop, directly influences what people do, their work activities, the action that shapes the landscape (Ruiz and Domon, 2012). This continuous and reciprocal interlinking between individuals and territory is based on a rational and reasoned evaluation of landscape attributes and characteristics that can be defined as cognitive contributor.

"Perceived impacts on landscape" refer to the perception of positive or negative impacts of anthropic activities on landscape:

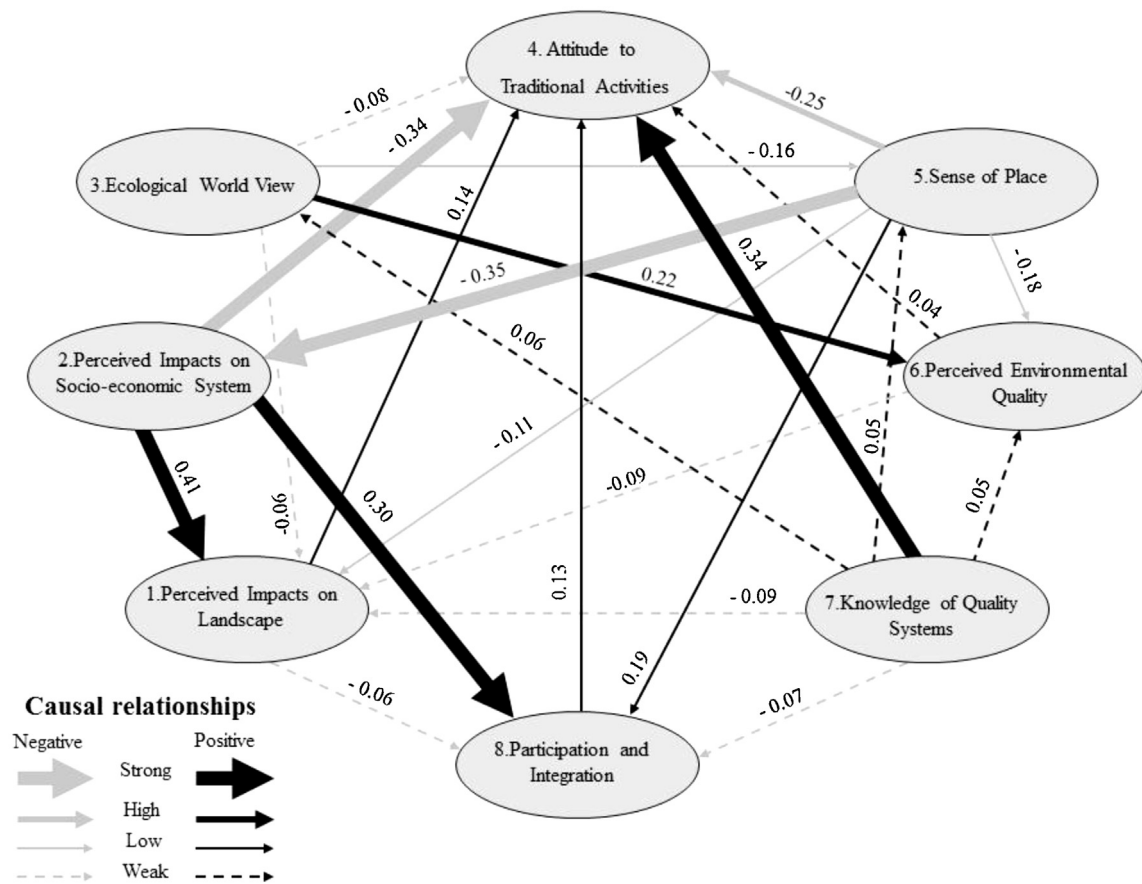


Fig. 2. SEM model developed for the whole sample (n=497).

Table 6 Reliability and discriminant validity analyses for attitude model factors (reduced sample, n = 265). All items use a Likert scale from 1 = disagree to 3 = agree.

Factor	Variable	Mean	SD	CR	AVE	SMC
Perceived impacts on landscape	Impact of agriculture on landscape	1.46	0.574	0.9268	0.9598	0.5776
	Impact of Tourism on landscape	1.48	0.592			0.6304
	Impact of commerce and services on landscape	1.49	0.600			0.4886
Perceived impacts on socio-economic system	Impact of construction industry on socio-economic development	1.34	0.584	0.8408	0.9655	0.6561
	Impact of industry on socio-economic development	1.29	0.519			0.6368
	Impact of commerce and services on socio-economic development	1.59	0.775			0.1369
Ecological world view	Impact of tourism on socio-economic development	2.37	0.796	0.9287	0.9105	0.1149
	Environmental protection ensures a future to coming generations	2.51	0.855			0.8987
Attitude to traditional activities	Environmental protection hides political and economic interests	1.81	0.978	0.8703	0.9170	0.5141
	Rural activities represent your future and income	2.08	0.968			0.5141
Sense of place	Artisan activities represent your future and income	2.20	0.956	0.5361	0.8205	0.1706
	In the municipality you live in, places deserve a visit	2.80	0.590			0.0751
Perceived environmental quality	Usually frequent these places	1.61	0.918	0.6889	0.8322	0.0666
	Feel responsible for the health of the landscape you live in	2.67	0.735			0.0650
	Traditions, local products and culture should be encouraged	1.87	0.953			0.2450
Knowledge of quality systems	Have a feeling that the landscape you live in is in danger	1.93	0.904	0.6313	0.8264	0.3457
	The environmental quality of the landscape you live in is conserved	2.67	0.735			0.2440
Participation and integration	Know well the meaning of quality certification systems	1.81	0.914	0.6102	0.7866	0.3469
	Know the quality certification systems applied to local products	1.71	0.886			0.1505
Participation and integration	Integration of foreign people and equal opportunities for them should be encouraged	1.19	0.512	0.6102	0.7866	0.3469
	Participation in planning processes should be encouraged	1.45	0.787			0.1505

SD = standard deviation; CR = composite reliability (Raykov rho); AVE = average variance extracted; SMC = squared multiple correlations that correspond to the shared variance.

this component shows a positive path towards “Attitude”, thus, suggesting that people who perceive negative impacts of agriculture, tourism and commercial activities on landscape are much more inclined to traditional activities. “Perceived impacts on socio-economic system” concern the perception of positive or negative impacts of anthropic activities on the local economy and society: respondents persuaded of the positive socio-economic effects of

industrial activities are less prone to engage in agriculture and craftsmanship according to the negative path linking this component to “Attitude”.

The perception of socio-economic impacts is also a good predictor of “Perceived impacts on landscape” as the significant positive link demonstrates and, in this case, an indirect but positive path is

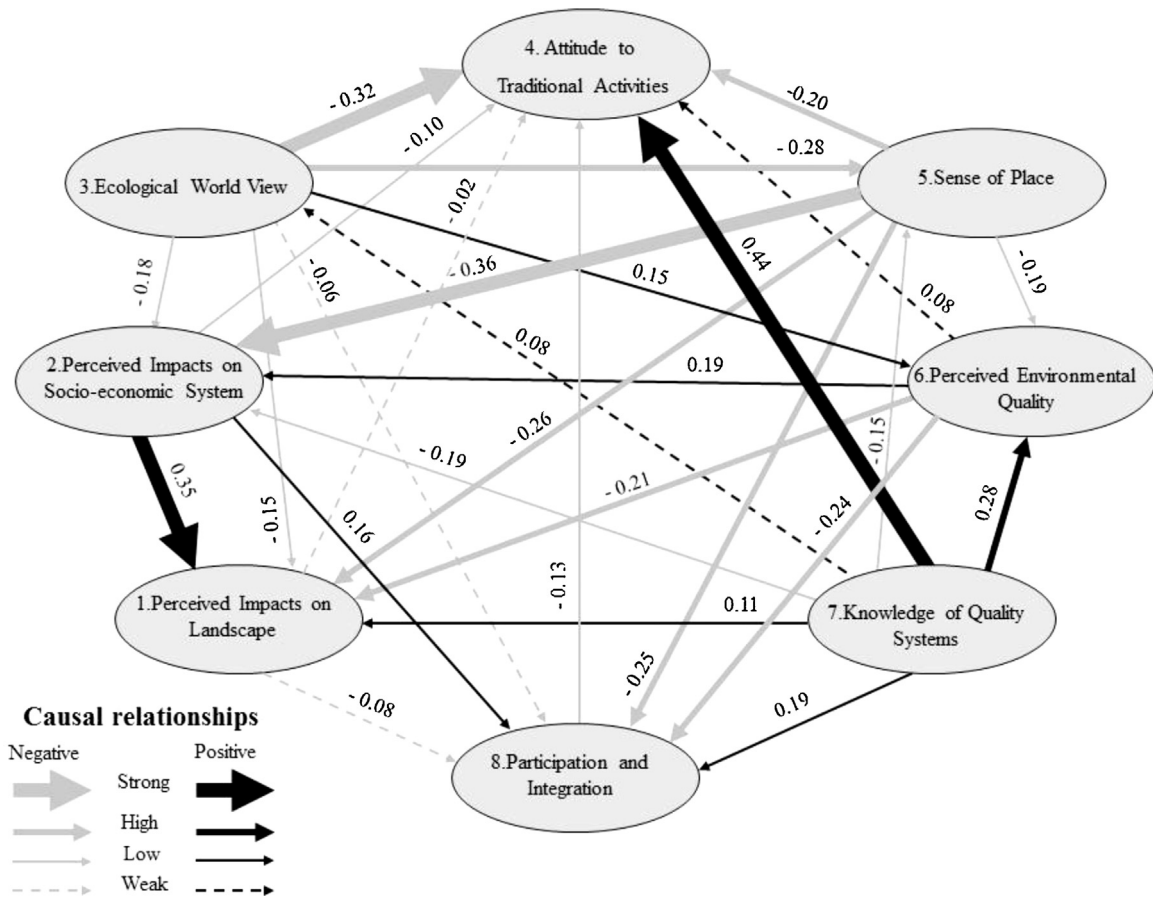


Fig. 3. SEM model developed for the reduced sample, i.e. only taking into account farmers and artisans ($n = 265$).

also evident from “Perceived impacts on socio-economic system” through “Perceived impacts on landscape” to “Attitude”.

An interesting relationship is the significant negative path between “Sense of place” and “Attitude”: a high average bond with the territory does not predict a potential willingness to be a farmer or artisan. However, when the emotional attachment to places is supported by a felt need of involvement in public processes and integration of foreign people, then a positive link between “Sense of place” and “Attitude” is established through the “Participation and integration” factor acting as a mediator. In other words, “Sense of place”, apart from one direct negative link has an indirect positive relation with “Attitude” through “Participation and integration”: if the sense of place is identified with strong local sentiments experienced with a mind-set open to share the local natural resources for the valorisation of the territory, then this affective bond brings people closer to traditional activities.

Moreover, a strong sense of place seems to be negatively linked to all the components related to perception aspects, thus, indicating a kind of innate opposition of people to the anthropic activities that would be seen as a threat to the territory in all its facets, from environmental to socio-economic aspects.

Also “Ecological world view” is directly negatively linked to “Attitude”, while it seems to follow a positive path through the mediation of local environmental quality perception.

To evaluate research question #2, “Are there differences between farmers and nonfarmers, artisans and nonartisans in the factors influencing attitude to traditional activities?”, we developed a SEM model for the entire sample (Fig. 2) and a SEM model considering only farmers and artisans (Fig. 3) and we compared

respective model components to identify similarities and distinctions between the two groups of respondents. The main difference to be noted is relative to the behaviour of the “Sense of place” component as a predictor towards the other constructs: in the SEM model for farmers and artisans, sense of place is no longer positively linked to participation and integration, rather it is characterized by all negative relationships with the other factors. The feeling of worry about the places which people are attached to, seems to be higher and much more influential on this sub-group of residents, who do appear not interested in other communities’ members or in participation in public processes. A positive path connects the “Knowledge of quality systems” with “Perceived local environmental quality” and also with “Participation and integration”: for these respondents, knowledge of the territory’s values and resources is a good predictor of high perceived environmental quality and it also represents a drive in opening themselves to foreign people and an incentive to be involved in public processes.

For farmers and artisans, more than for the whole sample, the key role in defining attitude towards traditional activities is played by a knowledge of land values, e.g. products of excellence and natural resources, representing the real outcomes of their work on the territory in terms of products and in terms of landscape protection.

As regards research question #3, “Is it possible to identify opportune leverage points to awaken communities’ interest and involvement in the traditional activities?”, the analysis of results from our case study has implications which management should take into account: answering research questions #1 and #2, we could define what factors are more or less influential in residents’ attitudes to traditional activities. We can now use this information

to help guide management (e.g. local politicians, administrations, LAG directors) suggesting opportune strategic interventions able to trigger specific leverage points to awaken and re-launch an efficient rural development of the area. For each proposed action, following the efficiency classification by Meadows (2009), a specific level of effectiveness has been associated to each leverage point activated.

One of the main outcomes of this research is the conservative and pragmatic mentality of the local community in general, and of farmers and artisans in particular. A great sense of place characterizes both groups of respondents as a negative predictor of attitude towards traditional activities and, for farmers and artisans, it is also a negative predictor of participation in public processes and integration with foreign people. Residents, rooted in their territory, express strong local identity as supportive of the motivation to preserve the status quo in the places where they live. This frame of mind has ensured a balance between human activities and natural resource conservation during the centuries, encouraging people to care about the landscape health. However, today, where the need of an economic upturn with a sustainable approach to landscape is deeply felt, a wider sense of community could be really helpful in encouraging people to find shared strategies to face economic, social and environmental issues.

The creation of networks in the local agri-food sector could improve the integration of agriculture into the food chain, which represents a key aspect of the rural development agenda and could also allow the incorporation of non-agricultural rural economies into a set of processes straddling both urban and rural spaces (Murdoch, 2000). For example, farmers could group together in a network embracing all the municipalities of the Teverina Consortium promoting a unique local brand under which all their products could be fostered and sold. There is a general agreement as to the key role played by networks of local actors in obtaining funds and resources (local or external) for the development, adoption and implementation of different types of innovation in the productive system of rural areas. Actions encouraging and strengthening relationships among stakeholders always turn out to be fruitful, but while some rural contexts are characterized by a traditional solidarity, others reveal an extremely weak aggregative capacity (Osti, 2000). In the study case examined, the research conducted underlines the impelling need to start the activation of social aggregation processes to increase the possibility of work in partnership, involving farmers and artisans, as emerged from SEM modelling (see negative link between “Sense of place” and “Attitude” factors). An example of a collective approach as an agri-rural development tool could be a territorial management contract (TMC) as proposed by Rocamora-Montiel et al. (2014): in TMCs farmers cooperate and agree to meet the commitments negotiated with the public administration. This kind of contract could support technological, environmental and commercial cooperation among farmers.

For our study area, farmers are a crucial node for the creation of the type of innovation mechanisms that can act as collective learning systems (Asheim et al., 2011) in which a fundamental role is played by innovation and knowledge networks. The establishment of experiences of cooperation and mutual trust among public and private stakeholders constitute the prerequisite to attract LEADER funds. Thus, the incentivisation of networks and collaborations in the agri-food sector can be considered an effective leverage point able to increase the information flows among individuals (level six of effectiveness, the structure of information flows). Moreover, the reinforcement of working partnerships and the encouragement of aggregation opportunities among citizens may help in understanding the limitations of the structure on which the social system lies thus activating another leverage point (level ten of effectiveness, the structure of material stocks and nodes of intersection). As Meadows underlines, the structure is crucial in a system but

changing it is rarely simple so that the leverage is in learning its limitations and bottlenecks, in order to improve the system.

The causal dependencies between SEM components show how strong local sentiments towards the place of residence, represented by the “Sense of place” factor, imply a limited involvement and interest on the part of farmers and artisans not only in participatory planning processes, but also in integration measures and foreign people.

As a consequence, to engage the whole community, including farmers and artisans and integrate them with foreign people, a greater effort is required to implement adequate actions focussed on social participation in landscape management and cultural exchange opportunities. All the suggested actions could trigger the activation of an incisive leverage point referring to “The power to add, change, evolve or self-organize system structure” (level four of effectiveness). This approach could contribute to maintaining and spreading knowledge and social capital among individuals, consolidating them as a group in dealing with new and complex issues (Menzel and Buchecker, 2013) and, as a consequence, could contribute to the creation of a more resilient and adaptive socio-ecological system. Reinforcing community relationships increases the social capital, which is the depository of history, culture and traditions at the basis of social evolution and self-organization (Meadows, 2009; Putnam et al., 1994). At the same time, a more clearly perceived integration among citizens improves the information structure of the social system, delivering information to people who did not receive it before and therefore causing those people to behave differently. Therefore, the activation of this kind of social process can be identified as a powerful leverage point with level six of effectiveness (the structure of information flows).

The negative link between the “Participation and integration” and “Attitude” components in the SEM model suggests participatory planning and public events to discuss interventions on the territory could be opportune in order to allow people to meet and communicate with each other. To further incline people towards traditional activities, some participatory actions could be conceived on a strictly local (e.g. municipality) scale, but others could usefully be on a larger scale, for example, involving all the inhabitants of the Teverina Consortium when the political and intervention decisions to be discussed would have repercussions on the whole territory. An administrative unification of the six municipalities could lead to a reduction in costs, while at the same time, favouring money transfer from the Lazio Region and the central Government.

A common management of shared services, such as urban planning, public works, differentiated rubbish collection, could allow considerable savings which could then be allocated to local rural development.

The idea of a wider community, as part of which all the residents in the six municipalities identify themselves, could lead, for example, to the organisation of coordinated and shared country festivals involving each in turn, or to the realization of walking and cycling paths from one village to the other through farmlands and along dirt tracks, thus, encouraging the flow of tourism with an evident positive impact on the local economy. All these interventions operate as leverage points with level four and six of effectiveness strengthening the social capital and the system resilience (and the ability to self-organize) and adding and/or restoring information flows among citizens.

The important role played by knowledge of the certification systems in the developed attitude model, brought to light by the high positive correlation between the “Knowledge of quality systems” and “Attitude” components in the SEM model, suggests intervening to increase people’s awareness of local food and wine products.

Thus, a set of opportune marketing actions to promote local products of excellence (e.g. C.D.O, T.G.I.) could contribute to stim-

ulating a return to agriculture activities. These actions would also strengthen the image of the territory, improve incomes and encourage public and private investments in certificated crop cultivation with positive effects on the local economy.

They could activate leverage points relative to the self-organizing system structure (level four of effectiveness), since they act on the reinforcement of social capital: this in turn would also lead to an improvement in information flows among citizens, thus, triggering a leverage point with level six of effectiveness.

As several authors underline (Bock and Fieldsend, 2012; Neumeier, 2012; Pollermann et al., 2013), one of the most important factors in successful initiatives in rural areas is the existence of innovative systems characterised by a network of economic, institutional and social actors.

Another key aspect which it appears should be actively supported is the formation of links between ecological vision, perceived local environmental quality and attitude. The SEM model constructed shows weak or negative predictive links between the two above-cited components (i.e. “Perceived Environmental Quality”, “Ecological World View”) and the “Attitude” component, thus, suggesting that interventions should be aimed at reinforcing these connections in order to attract people towards traditional activities such as agriculture and craftsmanship. A well-structured plan of environmental education involving schools, public administrations and inhabitants could reinforce the awareness of threats to natural resources, increase pro-environment behaviour and, as a consequence, incline people towards sustainable work activities. The reinforcement of such information flows represents a real and effective leverage point to be activated (level six of effectiveness, “The structure of information flows”). Improving the educational level of residents could also enhance the adaptive capacity of people in facing emerging problems, in other words, reducing the response time to sudden and/or unforeseen socio-economic and environmental modifications such as climate change. Actions aimed at increasing people’s awareness of social and environmental issues could then trigger another leverage point, “The lengths of the delays, relative to the rate of system change”, level nine of effectiveness.

Many suggested actions aim to improve the sense of place and the ecological view of residents; an effect linked to these actions is to make people more careful about the environment and landscape where they live. An environmentally conscious population is able to react better to illegal or selfish interventions that may provoke damage or loss of natural capital and local resources. Moreover, stronger networks among residents can emerge in order to contrast those actions, bringing them to public notice or even actively participating in the definition of shared rules for the safeguard of environmental and cultural goods (e.g. a landscape conservation plan). Definitely, actions aimed at increasing the sense of place and improve people’s ecological knowledge can activate a further leverage point, “The strength of negative feedback loops”, with level eight of effectiveness.

All the actions suggested would necessarily have economic effects, activating local and global circuits of products and services to regenerate an efficient and sustainable rural development. As this “mechanism” of regeneration starts, the perception of the positive impacts of traditional activities on the socio-economic system would then increase and, according to the developed attitude model, local communities and public institutions would be much more inclined to rediscover agriculture and craftsmanship re-investing time and money in them. Suggested actions could therefore impact the goals of the system moving them towards a sustainable economic development based on local traditional products and activities generating them (level three of effectiveness, “The goals of the system”).

7. Future developments

In this work, we have presented two ground-breaking residents’ attitude models to local traditional activities. The results of our research should be intended as a forerunner to further investigation aimed at providing another informative layer to planners and policy makers and shedding new light on the increasingly felt need for rural re-development. Further study of this issue would allow the main limitation of this study, i.e. the limited number of completed questionnaires with respect to the total population of the area, to be overcome.

Moreover, further additional questions could help to refine the residents’ attitude models to local traditional activities: improving the SEM structure and performance would allow a greater accuracy in the definition of the suggested leverage points, and in the determination of new ones, to be achieved.

Specific questions about landscape/ecosystem services provided by the study area should be introduced into the questionnaire to analyse the relationships between community and environment in depth, even evaluating residents’ willingness to pay money to preserve or improve landscape quality.

The integration of a landscape/ecosystem service framework into rural community behaviour assessment would enhance the effectiveness of planning strategies linking ecological and socio-economic aspects. Indeed, in accordance with Scolozzi et al. (2012), the potential losses or gains of ecosystem services may be effective in cost–benefit valuation, enhancing discussion within planning and definition of priorities in environmental policies. However, several critical aspects are still present using the ecosystem services approach in participatory planning (Fürst et al., 2014) and optimal land management could be reached only if ecosystem services are valorised and externalities are fully internalised by regional economic and institutional actors (Zanten et al., 2014). Moreover, the complexity of social–ecological landscapes requires strategic adaptive planning (Zurlini et al., 2012) to define resilient and sustainable landscapes able to provide consistently long-term, landscape-specific ecosystem services essential for maintaining and improving human well-being (Leone et al., 2014; Wu, 2013). However, well performed such assessments may be, this aim cannot be attained only on the basis of assessments without a long-term and multi-scale perspective, accepted as far as possible by both local residents and policy makers. Surely, as Osti (2000) reports, the success of every development opportunity, and in particular of LEADER programme implementations, strictly depends on the persons performing roles with high responsibility. Therefore, specific and strategic intervention actions could be better defined, planned and successfully implemented after a constructive and continuing debate with local stakeholders in order to adapt and scale the suggested general proposals to the specific local context.

8. Conclusions

This work aims to boost research in the field of participatory planning through a novel approach, identifying effective leverage points for a shared sustainable development in rural communities. To the authors’ knowledge, no studies have yet attempted to build models of attitude to traditional activities as a tool for the identification of development strategies. Moreover, no studies have proposed a SEM as a starting point for a leverage point definition following the Meadows scheme.

In particular, no model exists on the behavioural aspects of the rural landscape community of the Teverina Consortium. Our study and its results have the potential to provide helpful (albeit not necessarily widely generalizable, due to the limited sample) information for local planners and managers on ways to address

financial resources for an effective rural (re) development. In a period in which the economic crisis, together with the structural changes which have taken place in the agricultural sector are leading to growing financial constraints, while funding opportunities often fail to be effective, researchers and planners should use all the available information to provide tools and support for the improvement of rural policy implementation.

The research conducted on the six municipalities of the Teverina Consortium provided a clear response to three research questions: (1) it revealed the different factors influencing the community attitude towards local traditional activities; (2) it underlined the differences between categories (farmers and artisans and the whole sample) and (3) it allowed margins of intervention to be identified, aimed at improving the economic rural condition of the area examined through well accepted and perceived collective actions, while protecting the environment.

Despite the strong agricultural vocation of the whole area which is the object of our research, from a socio-economic point of view, evident changes in the primary sector have appeared over the years, thus, necessitating the proposal of up-to-date and efficient strategies of intervention. The overall results of the conducted study revealed that people still appreciate traditional work activities such as agriculture and craftsmanship even with an evident feeling of worry about the socio-economic conditions of the context.

The considerations formulated in the previous paragraphs suggest that planners, managers and local actors (e.g. Local Action Group) should focus their attention on opportune leverage points, identified by means of the SEM modelling results. The proposed actions could trigger the mechanism of rural re-development of the area reinforcing the social capital, strengthening a constructive sense of place and transforming the local community into a more resilient and adaptive socio-ecological system able to ensure and preserve ecosystem services. In particular, all the suggested actions aim to increase the cohesion among citizens and institutions and strengthen the sense of community promoting the creation of local networks, which represent an essential prerequisite to the setting up of Local Action Groups.

Actions at different levels of leverage point effectiveness (from ten to three) with interventions aimed at restoring and improving information flows among citizens, but also at increasing social capital and resilience, could finally activate a process leading to paradigm change in the social system moving it towards a sustainable rural development. System goals, positive (self-reinforcing), negative (self-correcting) feedback mechanisms, and information flows derive from what Meadows (2009) defines as paradigms, “shared social agreements about the nature of reality”. Operating in social systems at the level of paradigms can hit a powerful leverage point able to totally change the system itself (level two of effectiveness: The mind-set or paradigm out of which the system arises, Meadows, 2009). Societies, being dynamic and complex structures, tend to strongly resist paradigm shifts. However, in the specific context of the Teverina Consortium, the research conducted, in proposing actions to trigger lower level leverage points towards traditional activities, could help to boost the slow process of a paradigm shift aimed at recognizing as a new paradigm the idea of a sustainable rural development. In this view, attitude to local traditional activities may function as a high impact leverage point capable of re-activating economic growth without sacrificing sustainability.

Appendix A.

List of questions distributed to the residents in Teverina Consortium municipalities and considered in the construction of the attitude models.

X1: Farmlands have a relevant role in shaping landscapes.

X2: Have knowledge about the institutional bodies involved in the protection of landscape.

X3: Have a feeling that the landscape you live in is in danger.

X4: Feel responsible for the health of the landscape you live in.

X5: The concept of environmental protection is spreading to ensure a future to our world and to the next generations.

X6: The concept of environmental protection is spreading for political and economic interests.

X7: To improve environmental health, penalties for environmental damage need to be heavier.

X8: To improve environmental health, funding and economic incentives need to be increased.

X9: Agree with the following definition of landscape: “a “Landscape” means an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors.

X10: In the Municipality you live in, places and elements deserve a visit.

X11: Usually frequent these places (see question no. X10).

X12: The environmental quality of the landscape you live in is conserved and good.

X13: Have you noticed that changes have happened in landscape you live in.

X14: Agriculture has a negative impact on landscape.

X15: Tourism has negative impact on landscape.

X16: Industries have a negative impact on landscape.

X17: Construction industry has a negative impact on landscape.

X18: Commerce and services have a negative impact on landscape.

X19: Agriculture has a positive impact on social and economic development.

X20: Tourism has a positive impact on social and economic development.

X21: Industries have a positive impact on social and economic development.

X22: Construction industry has a positive impact on social and economic development.

X23: Commerce and services have a positive impact on social and economic development.

X24: Have knowledge of projects, interventions and /or political actions underway in the municipality you live in, which are relevant for local social and economic development.

X25: Have knowledge of quality certification systems applied to local products (e.g. DOC, DOP, IGT).

X26: Have knowledge of SCI and SPZ areas falling in the municipality you live in.

X27: Know well the meaning of DOP, DOC, IGT quality certification systems.

X28: Know well the meaning of SCI and SPZ areas.

X29: Rural activities represent a valid opportunity for your future work and income.

X30: Artisan activities represent a valid opportunity for your future work and income.

X31: To support social and economic development, tourism has to be encouraged.

X32: To support social and economic development, cultural and recreational activities have to be encouraged.

X33: To support social and economic development participation in planning processes has to be encouraged.

X34: To support social and economic development, integration of foreign people and equal opportunities for them have to be encouraged.

X35: To support social and economic development, new infrastructures and road connections have to be strengthened and developed.

X36: To support social and economic development, traditions, local products and culture have to be encouraged and promulgated.

X37: To support social and economic development, new job opportunities have to be encouraged.

X38: To support social and economic development, nature and landscape preservation have to be supported.

X39: To support social and economic development, commerce services have to be encouraged.

References

- Agarwal, J., Malhotra, N.K., 2005. An integrated model of attitude and affect: theoretical foundation and an empirical investigation. *J. Bus. Res.* 58, 483–493.
- Ajzen, I., 2001. Nature and operation of attitudes. *Annu. Rev. Psychol.* 52, 27–58, <http://dx.doi.org/10.1146/annurev.psych.52.1.27>
- Ajzen, I., Fishbein, M., 2011. Attitudes and the attitude–behavior relation: reasoned and automatic processes. *Eur. Rev. Soc. Psychol.* 11 (1), 1–33.
- Altman, I., Low, S., 1992. *Place Attachment*. Plenum Press, New York.
- Antrop, M., 2005. Why landscapes of the past are important for the future. *Landscape Urban Plan.* 70 (1–2), 21–34, <http://dx.doi.org/10.1016/j.landurbplan.2003.10.002>
- Arhonditsis, G.B., Stow, C.A., Steinberg, L.J., Kenney, M.A., Lathrop, R.C., McBride, S.J., Reckhow, K.H., 2006. Exploring ecological patterns with structural equation modeling and Bayesian analysis. *Ecol. Modell.* 192, 385–409.
- Arriaza, M., Cañas-Ortega, J.F., Cañas-Madueño, J.A., Ruiz-Aviles, P., 2004. Assessing the visual quality of rural landscapes. *Landscape Urban Plan.* 69 (1), 115–125, <http://dx.doi.org/10.1016/j.landurbplan.2003.10.029>
- Asheim, B.T., Smith, H.L., Oughton, C., 2011. Regional innovation systems: theory, empirics and policy. *Reg. Stud.* 45 (7), 875–891.
- Bagozzi, R.P., Yi, Y., Phillips, L.W., 1991. Assessing construct validity in organizational research. *Adm. Sci. Q.* 3, 421–458.
- Baur, J.W.R., Tynon, J.F., Gómez, E., 2013. Attitudes about urban nature parks: a case study of users and nonusers in Portland, Oregon. *Landscape Urban Plan.* 117, 100–111, <http://dx.doi.org/10.1016/j.landurbplan.2013.04.015>
- Blasi, C., 1994. *Fitoclimatologia del Lazio [Lazio phytoclimatology]*. *Fitosociologia* 27, 151–175 (in Italian).
- Bock, B.B., Fieldsend, A., 2012. Social innovation and sustainability; how to disentangle the buzzword and its application in the field of agriculture and rural development. *Stud. Agric. Econ. (Budapest)* 114 (2), 57–63.
- Bright, A.D., Manfredi, M.J., 1996. A conceptual model of attitudes toward natural resource issues: a case study of wolf reintroduction. *Hum. Dimens. Wildlife* 1 (1), 1–21, <http://dx.doi.org/10.1080/10871209609359048>
- Buijs, A.E., Pedrolí, B., Luginbühl, Y., 2006. From hiking through farmland to farming in a leisure landscape: changing social perceptions of the European landscape. *Landscape Ecol.* 21 (3), 375–389, <http://dx.doi.org/10.1007/s10980-005-5223-2>
- Buller, H., 2000. Re-creating rural territories: LEADER in France. *Sociol. Ruralis* 40, 190–199.
- Byrne, B.M., 2013. *Structural Equation Modeling With AMOS: Basic Concepts, Applications, and Programming*. Hall, R.C., (Ed.), Second ed.
- Carolan, M.S., 2008. More-than-representational knowledge/s of the countryside: how we think as bodies. *Sociol. Ruralis* 48 (4), 408–422, <http://dx.doi.org/10.1111/j.1467-9523.2008.00458.x>
- Cicchetti, D.V., 1994. Guidelines, criteria, and rules of thumb for evaluating normed and standardized assessment instruments in psychology. *Psychol. Assess.* 6, 284–290.
- Coetier, J.F., 1996. Dominant attributes in the perception and evaluation of the Dutch landscape. *Landscape Urban Plan.* 34 (1), 27–44, [http://dx.doi.org/10.1016/0169-2046\(95\)204-9](http://dx.doi.org/10.1016/0169-2046(95)204-9)
- Costanza, R., Hart, M., Posner, S., Talberth, J., 2009. *Beyond GDP: the need for new measures of progress*. In: *The Pardee papers no. 4*. The Frederick S. Pardee Center for the Study of the Longer-Range Future, Boston University, Boston.
- Council Regulation (EC) No 1698/2005 of 20 September 2005 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD).
- Crafts, N., Toniolo, G., 1996. *Economic Growth in Europe since 1945*. Cambridge University Press, Cambridge.
- Dargan, L., Shucksmith, M., 2008. LEADER and innovation. *Sociol. Ruralis* 48 (3), 274–291.
- De Groot, R.S., Alkemade, R., Braat, L., Hein, L., Willemsen, L., 2010. Challenges in integrating the concept of ecosystem services and values in landscape planning, management and decision making. *Ecol. Complex.* 7 (3), 260–272.
- De Snoo, G.R., Herzon, I., Staats, H., Burton, R.J.F., Schindler, S., van Dijk, J., Lokhorst, A.M., Bullock, J.M., Lobley, M., Wrba, T., Schwarz, G., Musters, C.J.M., 2013. Toward effective nature conservation on farmland: making farmers matter. *Conserv. Lett.* 6 (1), 66–72, <http://dx.doi.org/10.1111/j.1755-263X.2012.00296.x>
- Dillon, W.R., Goldstein, M., 1984. *Multivariate Analysis. Methods and Applications*. Wiley, New York, Chichester, Toronto, Brisbane, Singapore, <http://dx.doi.org/10.1007/s13593-013-0183-4>
- Eagly, A.H., Chaiken, S., 1993. *The Psychology of Attitudes*. Harcourt Brace Jovanovich College Publishers, Orlando, FL, US.
- Esparcia, J., 2014. Innovation and networks in rural areas. An analysis from European innovative projects. *J. Rural Stud.* 34, 1–14, <http://dx.doi.org/10.1016/j.jrurstud.2013.12.004>
- European Landscape Convention: Council of Europe, 2000. The European Landscape Convention. Strasbourg.
- Fjellstad, W., Mittenzwei, K., Dramstad, W., Øvren, E., 2009. Landscape protection as a tool for managing agricultural landscapes in Norway. *Environ. Sci. Policy* 12 (8), 1144–1152, <http://dx.doi.org/10.1016/j.envsci.2009.01.009>
- Fornell, C., Larcker, D.F., 1981. Evaluating structural equation models with unobservable variables and measurement error. *J. Market. Res.* 18 (1), 39–50.
- Fried, M., 2000. Continuities and discontinuities of place. *J. Environ. Psychol.* 20 (3), 193–205, <http://dx.doi.org/10.1006/jenvp.1999.0154>
- Fürst, C., Opdam, P., Inostroza, L., Luque, S., 2014. Evaluating the role of ecosystem services in participatory land use planning: proposing a balanced score card. *Landscape Ecol.*, <http://dx.doi.org/10.1007/s10980-014-0052-9>
- Gobattoni, F., Pelorosso, R., Lauro, G., Leone, A., Monaco, R., 2011. A procedure for mathematical analysis of landscape evolution and equilibrium scenarios assessment. *Landscape Urban Plan.* 103 (3–4), 289–302, <http://dx.doi.org/10.1016/j.landurbplan.2011.08.011>
- Gosling, E., Williams, K.J.H., 2010. Connectedness to nature, place attachment and conservation behaviour: testing connectedness theory among farmers. *J. Environ. Psychol.* 30 (3), 298–304, <http://dx.doi.org/10.1016/j.jenvp.2010.01.005>
- Haines-Young, R., Watkins, C., Wale, C., Murdock, A., 2006. Modelling natural capital: the case of landscape restoration on the South Downs, England. *Landscape Urban Plan.* 75 (3–4), 244–264, <http://dx.doi.org/10.1016/j.landurbplan.2005.02.012>
- Hair, J.F., Black, W.C., Babin, B.J., Anderson, R.E. 2009. *Multivariate Data Analysis*. 7th ed., P. Hall, (Ed.).
- Hanley, N., Acs, S., Dallimer, M., Gaston, K.J., Graves, A., Morris, J., Armsworth, P.R., 2012. Farm-scale ecological and economic impacts of agricultural change in the uplands. *Land Use Policy* 29 (3), 587–597, <http://dx.doi.org/10.1016/j.landusepol.2011.10.001>
- Hay, R., 1998. Sense of place in developmental context. *J. Environ. Psychol.* 18, 5–29.
- Hermann, A., Schleifer, S., Wrba, T., 2011. The concept of ecosystem services regarding landscape research: a review? *Living Rev. Landscape Res.* 5 (1), 1–37.
- Herzog, T.R., Herbert, E.J., Kaplan, R., Crooks, C.L., 2000. Cultural and developmental comparisons of landscape perceptions and preferences. *Environ. Behav.* 32 (3), 323–346, <http://dx.doi.org/10.1177/0013916500323002>
- High, C., Nemes, G., 2007. Social learning in LEADER: exogenous, endogenous and hybrid evaluation in rural development. *Sociol. Ruralis* 47 (2), 103–119.
- ISTAT, Italian National Institute of Statistics, 2000, 2010. *Italian General Agricultural Census*. ISTAT, Rome.
- ISTAT, Italian National Institute of Statistics, 2001, 2011. *Italian General Demographic Census*. ISTAT, Rome.
- Jorgensen, B.S., Stedman, R.C., 2001. Sense of place as an attitude: lakeshore owners attitudes toward their properties. *J. Environ. Psychol.* 21 (3), 233–248, <http://dx.doi.org/10.1006/jenvp.2001.0226>
- Jorgensen, B.S., Stedman, R.C., 2006. A comparative analysis of predictors of sense of place dimensions: attachment to, dependence on, and identification with lakeshore properties. *J. Environ. Manage.* 79 (3), 316–327, <http://dx.doi.org/10.1016/j.jenvman.2005.08.003>
- Ko, D.W., Stewart, W.P., 2002. A structural equation model of residents' attitude to tourism development. *Tourism Manage.* 23, 521–530.
- Kyle, G., Graefe, A., Manning, R., Bacon, J., 2004. Effects of place attachment on users' perceptions of social and environmental conditions in a natural setting. *J. Environ. Psychol.* 24 (2), 213–225, <http://dx.doi.org/10.1016/j.jenvp.2003.12.006>
- Larson, K.L., Santelmann, M.V., 2007. An analysis of the relationship between residents' proximity to water and attitudes about resource protection'. *Prof. Geogr.* 59 (3), 316–333, <http://dx.doi.org/10.1111/j.1467-9272.2007.00615.x>
- Leone, A., Gobattoni, F., and Pelorosso, R., 2014. Sustainability and planning: thinking and acting according to thermodynamics laws. *Journal of Land Use, Mobility and Environment*, (Special Issue Eighth International Conference INPUT).
- Lewicka, M., 2005. Ways to make people active: the role of place attachment, cultural capital, and neighborhood ties. *J. Environ. Psychol.* 25 (4), 381–395, <http://dx.doi.org/10.1016/j.jenvp.2005.10.004>
- Lewicka, M., 2011. Place attachment: how far have we come in the last 40 years? *J. Environ. Psychol.* 31 (3), 207–230, <http://dx.doi.org/10.1016/j.jenvp.2010.10.001>
- Lindberg, K., Johnson, R.L., 1997. Modeling resident attitudes toward tourism. *Ann. Tourism Res.* 24 (2), 402–424.
- Lyons, E., 1983. Demographic correlates of landscape preference. *Environ. Behav.* 15 (4), 487–511, <http://dx.doi.org/10.1177/0013916583154005>
- Maani, K.E., Cavana, R.Y., 2007. *Systems Thinking, System Dynamics: Managing Change and Complexity*. Prentice Hall, Auckland, NZ.
- MacCallum, R.C., Austin, J.T., 2000. Applications of structural equation modeling in psychological research. *Annu. Rev. Psychol.* 51, 201–226, <http://dx.doi.org/10.1146/annurev.psych.51.1.201>
- Markusen, J.R., Venables, A.J., 2000. The theory of endowment, intra-industry and multi-national trade. *J. Int. Econ.* 52 (2), 209–234, [http://dx.doi.org/10.1016/S0022-1996\(99\)55-0](http://dx.doi.org/10.1016/S0022-1996(99)55-0)
- McManus, P., Walmsley, J., Argent, N., Baum, S., Bourke, L., Martin, J., Pritchard, B., Sorensen, T., 2012. Rural community and rural resilience: what is important to

- farmers in keeping their country towns alive? *J. Rural Stud.* 28 (1), 20–29, <http://dx.doi.org/10.1016/j.jrurstud.2011.09.003>
- MEA, 2003. *Ecosystems and human well-being: a framework for assessment*. In: *Millennium Ecosystem Assessment Series*. Island Press, Washington, DC.
- Meadows, D., 2009. *Thinking in Systems. A Primer*. Earthscan, London (UK).
- Menzel, S., Buchecker, M., 2013. Does participatory planning foster the transformation toward more adaptive social–ecological systems? *Ecol. Soc.* 18 (1), 13.
- Murdoch, J., 2000. Networks—a new paradigm of rural development? *J. Rural Stud.* 16 (4), 407–419, [http://dx.doi.org/10.1016/S0743-0167\(00\)22-X](http://dx.doi.org/10.1016/S0743-0167(00)22-X)
- Murphy, E., Scott, M., 2014. Household vulnerability in rural areas: results of an index applied during a housing crash, economic crisis and under austerity conditions. *Geoforum* 51, 75–86, <http://dx.doi.org/10.1016/j.geoforum.2013.10.001>
- Nachtigall, C., Kroehne, U., Funke, F., Steyer, R., 2003. (Why) should we use SEM? Pros and cons of structural equation modeling. *Methods Psychol. Res. Online* 8 (2), 1–22.
- Natori, Y., Chenoweth, R., 2008. Differences in rural landscape perceptions and preferences between farmers and naturalists. *J. Environ. Psychol.* 28 (3), 250–267, <http://dx.doi.org/10.1016/j.jenvp.2008.02.002>
- Neumeier, S., 2012. Why do social innovations in rural development matter and should they be considered more seriously in rural development research? Proposal for a stronger focus on social innovations in rural development research. *Sociol. Ruralis* 52 (1), 48–69, <http://dx.doi.org/10.1111/j.1467-9523.2011.00553.x>
- Nguyen, N.C., Bosch, O.J.H., 2013. A systems thinking approach to identify leverage points for sustainability: a case study in the Cat Ba biosphere reserve, Vietnam. *Syst. Res. Behav. Sci.* 30 (2), 104–115.
- Osti, G., 2000. Leader and partnerships: the case of Italy. *Sociol. Ruralis* 40 (2), 172–180.
- Pelorusso, R., Della Chiesa, S., Tappeiner, U., Leone, A., Rocchini, D., 2011. Stability analysis for defining management strategies in abandoned mountain landscapes of the Mediterranean basin. *Landscape Urban Plan.* 103 (3–4), 335–346, <http://dx.doi.org/10.1016/j.landurbplan.2011.08.007>
- Pelorusso, R., Leone, A., Boccia, L., 2009. Land cover and land use change in the Italian central Apennines: a comparison of assessment methods. *Appl. Geogr.* 29 (1), 35–48, <http://dx.doi.org/10.1016/j.apgeog.2008.07.003>
- Perkins, D.D., Long, D.A., 2002. Neighborhood sense of community and social capital: a multi-level analysis. In: Fisher, A., Sonn, C., Bishop, B. (Eds.), *Psychological Sense of Community: Research, Applications, and Implications*. Plenum, New York, pp. 291–318, Chapter 15.
- Pollermann, K., Raue, P., Schnaut, G., Europe, T., Union, E., Paradigm, N.R., 2013. Rural development experiences in Germany: opportunities and obstacles in fostering smart places through LEADER. *Stud. Agric. Econ.* 115, 111–117.
- Proshansky, H.M., Fabian, A.K., Kaminoff, R., 1983. Place identity: physical world socialization of the self. *J. Environ. Psychol.* 3, 57–83.
- Pugesek, B.H., Tomer, A., Von Eye, A. (Eds.), 2003. *Cambridge University Press*.
- Putnam, R.D., Leonardi, R., Nanetti, R.Y., 1994. *Making Democracy Work: Civic Traditions in Modern Italy*. Princeton University Press.
- Randelli, F., Romei, P., Tortora, M., 2014. An evolutionary approach to the study of rural tourism: the case of Tuscany. *Land Use Policy* 38, 276–281, <http://dx.doi.org/10.1016/j.landusepol.2013.11.009>
- Raykov, T., Marcoulides, G.A., 2010. *Introduction to Psychometric Theory, 1st ed.* Routledge, pp. p. 352.
- Raymond, C.M., Brown, G., Weber, D., 2010. The measurement of place attachment: personal, community, and environmental connections. *J. Environ. Psychol.* 30 (4), 422–434, <http://dx.doi.org/10.1016/j.jenvp.2010.08.002>
- Rimbert, S., 1973. *Approches des paysages. L'Espace Géographique* 3, 81–92.
- Rocamora-Montiel, B., Glenk, K., Colombo, S., 2014. Territorial management contracts as a tool to enhance the sustainability of sloping and mountainous olive orchards: evidence from a case study in Southern Spain. *Land Use Policy* 41, 313–324.
- Rogge, E., Nevens, F., Gulinc, H., 2007. Perception of rural landscapes in Flanders: looking beyond aesthetics. *Landscape Urban Plan.* 82 (4), 159–174, <http://dx.doi.org/10.1016/j.landurbplan.2007.02.006>
- Ruiz, J., Doman, G., 2012. Relationships between rural inhabitants and their landscapes in areas of intensive agricultural use: a case study in Quebec (Canada). *J. Rural Stud.* 28 (4), 590–602, <http://dx.doi.org/10.1016/j.jrurstud.2012.09.005>
- Schewenius, M., McPhearson, T., Elmqvist, T., 2014. Opportunities for increasing resilience and sustainability of urban social–ecological systems: insights from the URBES and the cities and biodiversity outlook projects. *Ambio* 43 (4), 434–444, <http://dx.doi.org/10.1007/s13280-014-0505-z>
- Schouten, M., Opdam, P., Polman, N., Westerhof, E., 2013. Resilience-based governance in rural landscapes: experiments with agri-environment schemes using a spatially explicit agent-based model. *Land Use Policy* 30 (1), 934–943, <http://dx.doi.org/10.1016/j.landusepol.2012.06.008>
- Scolozzi, R., Morri, E., Santolini, R., 2012. Delphi-based change assessment in ecosystem service values to support strategic spatial planning in Italian landscapes. *Ecol. Indic.* 21, 134–144, <http://dx.doi.org/10.1016/j.ecolind.2011.07.019>
- Scott, A., 2002. Assessing public perception of landscape: the LANDMAP experience. *Landscape Res.* 27 (3), 271–295, <http://dx.doi.org/10.1080/01426390220149520>
- Senge, P.M., 2006. *The Fifth Discipline: The Art and Practice of the Learning Organization (Revised and Updated)*. Random House, Inc., New York, USA.
- Stedman, R.C., 2002. Toward a social psychology of place: predicting behavior from place-based cognitions, attitude, and identity. *Environ. Behav.* 34 (5), 561–581, <http://dx.doi.org/10.1177/0013916502034005001>
- Stenseke, M., 2009. Local participation in cultural landscape maintenance: lessons from Sweden. *Land Use Policy* 26 (2), 214–223, <http://dx.doi.org/10.1016/j.landusepol.2008.01.005>
- Stewart, W.P., Liebert, D., Larkin, K.W., 2004. Community identities as visions for landscape change. *Landscape Urban Plan.* 69 (2–3), 315–334, <http://dx.doi.org/10.1016/j.landurbplan.2003.07.005>
- Stokols, D., Shumaker, S.A., 1981. *People in places: a transactional view of settings*. In: Harvey, J. (Ed.), *Cognition, Social Behaviour, and the Environment*. Erlbaum, NJ.
- Storper, M., 1995. The resurgence of regional economies, ten years later: the region as a nexus of untraded interdependencies. *Eur. Urban Reg. Stud.* 2 (3), 191–221, <http://dx.doi.org/10.1177/096977649500200301>
- Tempesta, T., 2010. The perception of agrarian historical landscapes: a study of the Veneto plain in Italy. *Landscape Urban Plan.* 97 (4), 258–272, <http://dx.doi.org/10.1016/j.landurbplan.2010.06.010>
- Terluin, I.J., 2003. Differences in economic development in rural regions of advanced countries: an overview and critical analysis of theories. *J. Rural Stud.* 19 (3), 327–344, [http://dx.doi.org/10.1016/S0743-0167\(02\)71-2](http://dx.doi.org/10.1016/S0743-0167(02)71-2)
- Teverina Local Action Group, 2013. *Annual Report on Local Development Plan Implementation*.
- Trabalzi, F., De Rosa, M., 2012. Market and state-supported sustainability: a tale of two rural communities in Iowa and Italy. *Sociol. Ruralis* 52 (1), 115–133.
- Tress, B., Tress, G., 2001. Capitalising on multiplicity: a transdisciplinary systems approach to landscape research. *Landscape Urban Plan.* 57 (3–4), 143–157.
- Uzzell, D., Pol, E., Badenas, D., 2002. Place identification, social cohesion, and environmental sustainability. *Environ. Behav.* 34 (1), 26–53, <http://dx.doi.org/10.1177/0013916502034001003>
- Valentin, A., Spangenberg, J.H., 2000. A guide to community sustainability indicators. *Environ. Impact Assess. Rev.* 20, 381–392.
- Van den Berg, A.E., Koole, S.L., 2006. New wilderness in the Netherlands: an investigation of visual preferences for nature development landscapes. *Landscape Urban Plan.* 78 (4), 362–372, <http://dx.doi.org/10.1016/j.landurbplan.2005.11.006>
- Van Eupen, M., Metzger, M.J., Pérez-Soba, M., Verburg, P.H., van Doorn, A., Bunce, R.G.H., 2012. A rural typology for strategic European policies. *Land Use Policy* 29 (3), 473–482, <http://dx.doi.org/10.1016/j.landusepol.2011.07.007>
- Wellbrock, W., Roep, D., Wiskerke, J., 2012. An integrated perspective on rural regional learning. *Eur. Countryside* 4 (1), 1–16, <http://dx.doi.org/10.2478/v10091-012-0010-y>
- Williams, D.R., Stewart, S.I., 1998. Sense of place: an elusive concept that is finding a home in ecosystem management. *J. For.* 96 (5), 18–23.
- Wu, J., 2013. Landscape sustainability science: ecosystem services and human well-being in changing landscapes. *Landscape Ecol.* 28 (6), 999–1023, <http://dx.doi.org/10.1007/s10980-013-9894-9>
- Zanten, B.T., Verburg, P.H., Espinosa, M., Gomez-y-Paloma, S., Galimberti, G., Kantelhardt, J., Kapfer, M., Lefebvre, M., Manrique, R., Piore, A., Raggi, M., Schaller, L., Targetti, S., Zasada, I., Viaggi, D., 2014. *European agricultural landscapes, common agricultural policy and ecosystem services: a review*. *Agron. Sustain. Dev.* 34 (2), 309–325.
- Zurlini, G., Petrosillo, I., Jones, K.B., Zaccarelli, N., 2013. Highlighting order and disorder in social–ecological landscapes to foster adaptive capacity and sustainability. *Landscape Ecol.* 28 (6), 1161–1173, <http://dx.doi.org/10.1007/s10980-012-9763-y>