Agricultural landscape as a driver of regional competitiveness - The role of stakeholder networks in landscape valorisation

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Paper prepared for presentation at the 3rd AIEAA Conference
"Feeding the Planet and Greening Agriculture: Challenges and opportunities for the bio-economy"

25-27 June, 2014
Alghero, Italy

Summary

The use and valorisation of landscape services provided in agricultural landscapes are assumed to create socio-economic benefits, which in turn can enhance the competitiveness of rural regions. However, the causal relationships between the valorisation of landscape and the socio-economic benefits are complex and up to now not comprehensively understood. Results of a stakeholder workshop held in a rural area in the northern Austrian Alps indicate, that functioning networks of regional actors are of utter importance for successful landscape valorisation. Also literature reveals that the successful involvement of stakeholders is a major factor for an effective management of complex social processes. Against this background our paper analyses the contribution of social networks to landscape valorisation in the Austrian study region "Mittleres Ennstal". We apply a Social Network Analysis (SNA) on a closed stakeholder network of altogether 22 institutions representing agriculture, tourism, local administration, local economy, nature conservation and rural development. We combine SNA with an expert evaluation of different strategies of landscape valorisation and assess how regional socio-economic benefits from landscape valorisation potentially impact on regional competitiveness. The study gives insights about the density of stakeholder networks in rural areas and about the different strategies of landscape valorisation pursued by different stakeholder groups. The method applied is suitable to show the potentials of stakeholder networks in fostering landscape valorisation. It furthermore is able to detect strategic gaps and thus can reveal potential starting points for the improvement and bundling of landscape valorisation strategies aiming at the enhancement of regional competitiveness.

Keywords: Social Network Analysis, Stakeholder networks, Landscape valorisation strategies, Agricultural landscape

JEL Classification codes: Q15, Q180, Q51

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1. INTRODUCTION

In recent years, importance is increasingly attached to the question, how agricultural landscape and the valorisation of landscape services contribute to the development and competitiveness of rural regions. It is assumed that the valorisation of landscape services results in socio-economic benefits like the enhancement of the stability and growth of the local population, the generation of jobs, the creation of added value, or the increase of local investments. Such benefits potentially influence and enhance regional competitiveness (e.g. van Zanten et al. 2013; Cooper et al. 2009; Courtney et al. 2006; van der Meulen et al. 2011; Courtney et al. 2013; Dissart & Vollet, 2011). However, the causal relationships between the valorisation of landscape services and the resulting socio-economic benefits are complex and up to now not comprehensively understood (Dissart & Vollet, 2011). The results of an upstream stakeholder participation process in a rural area in the northern Austrian Alps indicate that functioning networks of regional actors are of utter importance for successful landscape valorisation. Also literature reveals that the successful involvement of stakeholders is a major factor for an effective management of complex social processes (Beierle, 2002; Bryson et al., 1990; Bryson, 2004; Beierle & Cayford, 2002; Nutt, 2002; Stave, 2002). In regional economies social networks are of particular importance as they can improve competitiveness by influencing cost effects due to the bundling of activities and by increasing innovation potentials (Bachinger et al., 2011).

Against this background our study applies a Social Network Analysis (Borgatti et al. 2002), which targets at identifying the network of actors having a stake in local landscape management and landscape valorisation. To locate strategic gaps in the network and to detect potential starting points for the improvement and bundling of landscape valorisation strategies, the study particularly takes into account the different strategies of landscape valorisation which are pursued by the single actors within the network. The SNA method has been applied to describe and analyse social networks in various research fields. Normally, the method is used to analyse stakeholder networks. Prell et al. (2008) for example uses SNA to identify the stakeholder network of social learning projects in district national parks. Recently, SNA is often used in analysing stakeholder networks in the context of natural resource management and governance (e.g. bodin & Crona, 2009; Bodin et al., 2006; De Nooy, 2013). In particular as regards natural resource management, the importance of communication and network structures is highlighted by Newman and Dale (2005), Bodin et al. (2006) or Chang et al. (2012).For regional research however – despite being suitable – the method is still rarely used. Koch (2010) analyses a regional stakeholder network in the context of a biosphere reserve. Hübner (2013) for example uses SNA for investigating a stakeholder network in the context of landscape management of different peatland sites in Germany. In the context of landscape valorisation however, SNA has, to our knowledge, not been applied before. The study takes place in the Austrian study region “Mittleres Ennstal”, which represents a typical remote mountain area, characterized by rather low-intensive dairy farming in a classical and richly structured mountainous landscape.

2. SOCIAL NETWORK ANALYSIS

In general, Social Network Analysis measures the relationships between actors and groups of actors. At this, it distinguishes between ego and complete networks. 'Complete networks' focus on all actors and all ties between these actors. 'Ego networks', in contrast, are aimed to analyse only the relations of one central actor (ego) (e.g. personal/friendship networks). In SNA, actors are also called 'nodes' or 'vertices', while the connecting relationships are called 'links' or 'ties'. Pairs of actors and the ties between them represent 'dyads'. Within a 'directed' network, it can be distinguished between 'tie sender' and 'tie receiver'. Dyads are 'reciprocal' if both actors within the dyad confirm the tie between them (both actors send out ties to the other actor within the dyad), elsewise the dyad is called 'asymmetric' (Wasserman & Faust, 2009). Network data can be evaluated either weighted or binary. At this, binary evaluation reflects the quantity of a relation while weighted evaluation reflects the quality of a relation (Jansen, 2006). SNA connects absolute attributes with relational attributes and therefore enables the description of internal group structures (Jansen, 2006, S.51).

Network measures are calculated based on graph theory. The core aspect of this method is to calculate a valued graph G(v) which considers nodes (N), links/ties (L) and values (V) of a group:

G(N,L,V)=G(v)

where N={n1,n2,…,ng} L={l1,l2,…,lL} V={v1,v2,…,vL}.

2.1. Actor-level based parameters

To identify the relevant stakeholders of landscape management and landscape valorisation, the first level of the analysis targets at the level of actors. On this level all respondents are fully addressed in the sense of information control and potential communication activity. On actors' level we focus on the basic SNA measure of "degree centrality". With degree centrality, the immediate contacts an actor has to other actors in the network, is measured. In "directed" networks degree centrality is distinguished into indegree and outdegree centrality. At this, indegree counts received (incoming) ties, while outdegree counts sent (outgoing) ties (Borgatti et al., 2013, p.178).

In line with Prell, (2011, p.100), indegree and outdegree is calculated as follows:

Indegree: $C_1(i) = \sum_{j=1}^{n} xji \qquad i \neq j$

x_{ji} = value of the tie from actor j to actor i (value being either 0 or 1)
n= total number of nodes in the network

Outdegree: $C_0(i) = \sum_{j=1}^{n} xij \qquad i \neq j$

x_{ij} = value of the tie from actor i to actor j (value being either 0 or 1)

n= total number of nodes in the network

Degree centrality assesses the involvement of an actor in the network. High scores of degree centrality refer to actors who represent "channels" of information (Prell, 2011, S.97). Such actors access and spread information faster than others (Prell, 2011, p.97).

As second value on actor-level, we calculate "betweenness centrality". Betweenness centrality computes a score for individual actors, considering other actors' ties. The measure includes the placement of an actor within the network. Betweenness centrality is sophistically calculated using binary data (Borgatti et al., 2013, p.179).

$$C_B(k) = \sum \delta_{ikj} / \delta_{ij} \qquad i \neq j \neq k$$

δ_{ikj} = the number of geodesics linking actors I and j that pass through node k
δ_{ikj} = the number of geodesics linking actors I and j

Betweenness centrality describes the actors' potential to control information (Jansen, 2006, S.137). High values of betweenness centrality indicate that an actor is often placed on the shortest path between two unconnected actors (PRELL, 2011,p.104; HENNIG, 2012,p.126). Actors with high betweenness centrality have more control considering the information flow; consequently such actors can spread but also distort or withhold information easily (JANSEN, 2006, p.137). Furthermore, actors with high betweenness centrality potentially reduce the buffering capacity of the network in case of losing those actors. Thus, in the case of fragmentation, the network can experience a reduction of confidence and confidence building (Borgatti, 2003).

2.2. Network-level based parameters

Parameters chosen to describe the network-level are 'density' and 'dyad-based reciprocity'. Using unvalued data, results of the calculation of 'density' and 'dyad-based reciprocity' show scores between 0 and 1; here, scores approaching 1 indicate very dense and reciprocal networks.

As regards the 'density' of relations, this parameter is calculated by the proportion of possible ties to realised counted ties (Jansen, 2006, S.110f.; Wasserman & Faust, 2009).

$$Density = \frac{\sum_{i=1}^{N} \sum_{j=1}^{N} x_{ij}}{N(N-1)} \qquad i \neq j$$

Basically, high density of a social network is assumed to foster mutual confidence and group identity (James, 1990 cited in Bodin et al., 2006). On the other hand, in very dense networks the heterogeneity of the actors involved can decrease: in general, the heterogeneity of actors within a network is decisive for broad and multifaceted knowledge base - which has positive effects on the capacity for innovation (FOLKE et al., 2005). In very dense networks however, homogeneity of experience and attributes can be promoted. In such situations the capacity for economic, political or cultural innovation can be considerably reduced (Newman and Dale, 2005; Grabher, 1993).

As regards 'dyad-based reciprocity', this parameter addresses the problem that in communication networks it is necessary to be suspicious of the social desirability bias (Borgatti et al., 2013, p.176) Since, for example, the actors' network in our study is based on a small (geographical) region, actors may declare connections because of the perception that they 'should' know or have contact with other actors in the network. An actor's capability of self-reflection becomes obvious by the reciprocity of ties. Considering the topic on network level, therefore "dyad-based reciprocity" of ties is calculated.

Dyad-reciprocity is defined by relation between the amount of reciprocal dyads and the amount of all dyads (Jansen, 2006, p.111; Wasserman and Faust, 2009).

$$dyad-based\ reciprocity = \frac{\sum_{i=1}^{N} \sum_{j=1}^{N} (x_{ij} + x_{ji})}{\left(\frac{[N(N-1)]}{2}\right)}$$

for $i \neq j, i < j$ and $(x_{ij} + x_{ji}) = 1$, if both values are 1, otherwise 0

Additionally to density and dyad-based reciprocity, on network-level 'average degree' and 'average distance' are calculated. 'Average degree' represents the average number of ties of each node. 'Average distance' focuses on the average distance between two nodes, considering the length of the shortest path (Borgatti et al., 2002). At this, a path is a 'walk' which can only be passed once by each actor and each relation (Hanneman and Riddle, 2005)

2.3. Sub-network-level based parameters

The aim of this study is the analysis of landscape valorisation strategies and the connection of actors pursuing such strategies in the network. Therefore, during the survey, data on strategies of landscape valorisation pursued by the different actors is gathered. These strategies are used as 'blocking' attributes in order to describe strategical "sub-networks", which are subject to a separate analysis.

As regards 'blocking' of actors, literature describes different methods: Firstly, in "a posteriori block models", blocking takes place according to the structure of the network (e.g. similar positions of actors) (Schmidt & Aufenvenne, 2013). Secondly, in "a priori block models", blocking is based on pre-set attributes (Schmidt & Aufenvenne, 2013, 2013). An example for an "a priori block model" is Koch's (2010) study analysing a regional actors' network by using the "sphere of activity" and the "regional or trans-regional connectivity of actors" as blocking variables (Koch, 2010).

Similar to Koch's (2010) approach, our study applies an "a priori block model". As blocking attributes the "strategies" of landscape valorisation are used. In doing so, e.g. all actors pursuing the strategy "tourism" are put into the sub-network "tourism", while all other actors are put together in the group of "others". Due to blocking, the connectivity of single sub-networks can be analysed. Additionally, the standard deviation within the blocks is calculated; this measure in particular serves as validity check for the blocking (Hanneman & Riddle, 2005). In general, high densities within groups and low densities between groups are a significant sign for a clustered social structure (Hanneman & Riddle, 2005).

3. CONDUCTION OF THE STUDY

The social network analysis in this study is based on an extensive survey which aims at considering the whole "landscape valorisation" network in the study region. The relevant actors within the network are identified by combining the realistic and the reputational approach of boundary specification (Laumann, 1989): In a first step – based on expert knowledge from the previously held LSL workshop – 5 key-stakeholders are identified, who in turn list all relevant local actors impacting on the valorisation of the local agricultural landscape. In the end, a network of 34 institutions, which represent local agriculture, tourism, local administration, local economy, nature conservation and rural development, is identified.

Following the research approach of Hübner (2013) and Benta (2005), network data is collected using a standardized questionnaire. In particular, three relations are assessed (cf. chapter **Errore. L'origine riferimento non è stata trovata.**, Annex II):

- *Acquaintance:* This relation describes if an actor is acquainted with other actors. (Yes or no)
- *Communication:* This relation describes if actors are communicating and assesses how intensive the communication is. Here, valued data is collected using a fixed scale reaching from intensity (1) *"occasional contact*", to intensity (2) "*frequent contact*", to intensity (3) "*intensive contact*"

- *Conformity on strategies of landscape valorisation*: Again using a fixed scale, this relation describes if the strategies pursued have a conformity value of (1) opposite, (2) rather opposite, (3) neutral, (4) rather common or (5) common.

Furthermore, in the questionnaire the institutions' strategies of landscape valorisation are assessed and evaluated by the respondents as regards their contribution to regional competitiveness.

The questionnaire is sent to single representatives of the identified 34 institutions. The representatives are asked to answer the questions considering the collective communication habits of their institution. In the case of institutions represented by more than one actor, or in the case that different institutions represent one unity (e.g. tourism), the single actors questionnaires are clustered. Finally, the complete network consists of 22 institutions. SNA parameters for institutions, where grouping takes place, are calculated by using the average value of all answers. Due to the character of data collection, which enables the assessment of information on the direction of the communication, the intensity of the communication and the conformity of strategies, the data gathered is valued and directed. To simplify the interpretation, unvalued data is used for calculations, whereas valued data is used for visualisation. Data analysis is done by using the software VISONE (Brandes and Wagner, 2004) and UCINET (Borgatti et al., 2002 , p.14). VISONE specialises on graph visualisation, while UCINET focuses on matrices and various network analysis parameters (Borgatti et al., 2002; Baur, 2008,p.14).

Visualisation of the networks is based on centrality layouts. Within a centrality layout the number of open ties is kept low and link crossing is optimised (Baur, 2008, p.104). Due to this layout-algorithm, actors with similar ties are grouped together (Hübner 2013, p.176f).

In the analysis, two network models are investigated. The first model (1) considers all existing contact ties within the network, without making differences as regards intensity of contact. The second model (2) is deviated by using only ties with high intensity scores ("frequent contact" and "intensive contact"). Social network parameters are calculated on actors level, on network-level for the complete network, and for blocked sub-networks.

4. RESULTS

4.1. Results Network level

The basic network in model 1 consists of 351 ties including all of the 22rd institutions. The network in model 2 includes 142 ties within the same amount of actors. The number of "possible ties" in model 2 is consequently equal to model 1 (see **Errore. L'origine riferimento non è stata trovata.**).

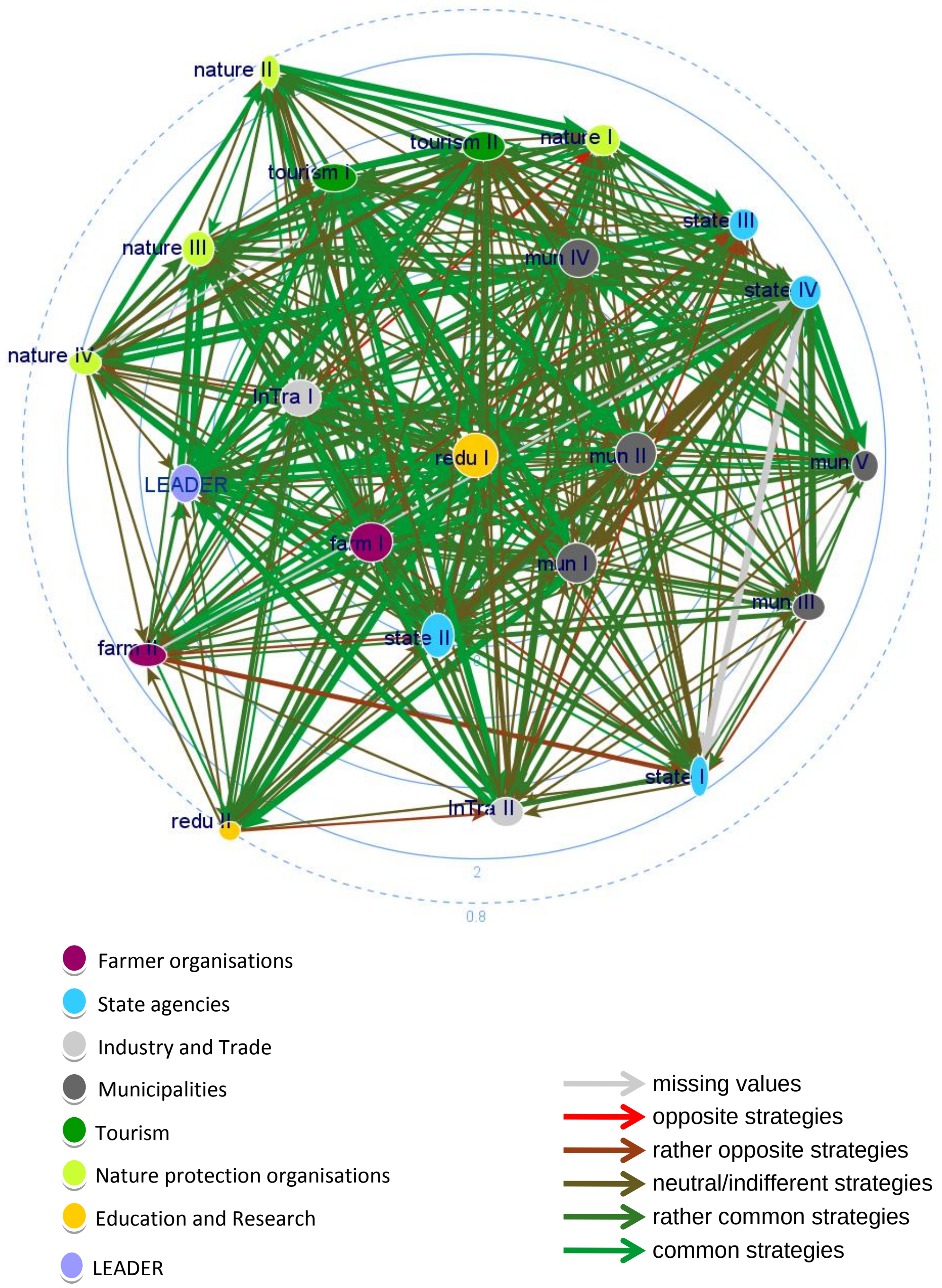
Table 1. Key figures on overall network level

Parameters	**Model 1**	**Model 2**
possible ties	461	461
existing ties	351	142
density	0,761	0,308
dyad-based reciprocity	0,712	0,327
average degree	15,95	6,455
average distance	1,240	1,839
average tie value considering contact intensity	1,533	2,317
average tie value considering conformity of strategy	3,809	4,268

The basic network in model 1 shows a density of 0.761 which is twice as much compared to the density of model 2. Additionally, in model 2 the average degree decreases, whereby the average distance increases compared to the network in model 1. The dyad-based reciprocity of network model 1 is 0,7122; this means that 28.8% of adjacent dyads are not reciprocal.

In Figure 1 the basic network on actors' level is visualised. Tie width illustrates contact intensities whereas tie colour indicates conformity of strategies.

Figure 1: Visualisation of the basic network



Most contacts in the basic network are rather occasional, therefore the average tie weight, describing the average intensity of the contact, is only 1,533. Looking at the conformity of strategies, the average tie value is with 3,809 considerably high; only one tie in the network indicates an opposite strategy combined with occasional contact intensity.

The layout of the graph is based on betweenness centrality, thus node expanses show the characteristics of the scores. Node width is based on outdegree and node height on indegree. Consequently, a balanced number of indegree and outdegree shows a round node. Bigger nodes (higher values) are located more central. For example the actor redu I (=research and education) has the highest betweenness centrality of 13.32 and an equal in- and outdegree of 21. This actor is in contact with every other actor in the network and all of its ties are reciprocal. In contrast Redu II has the lowest scores in all categories and is located in the periphery.

4.2. Results Sub-network level

On sub-network level, nine categories of landscape valorisation strategies are differentiated (Table 2).

Table 2. Strategies of landscape valorisation

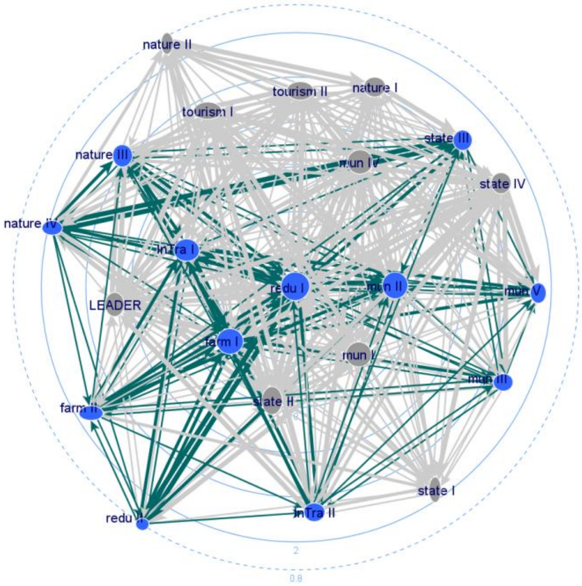
Strategies pursued		Contribution to competitiveness		Frequency of strategies (n)
		Average	Standard deviation	
S1	regional planning	3	0	2
S2	education strategies	4,13	0,835	8
S3	infrastructure	4,67	0,577	3
S4	nature, landscape and environment	4,14	0,9	7
S5	regional products	4	1,578	9
S6	tourism	4,5	0,674	12
S7	support of local businesses	4	1,414	4
S8	agricultural production	4,04	1,01	12
S9	maintenance of cultural heritage	4,5	0,707	2
S10	vertical integration	5	0	1

As regards the contribution of the strategies to regional competitiveness, ‘regional planning’ reached the lowest score on average; its standard deviation (SD) is 0. In contrast, the strategy of ‘marketing strategies of regional products’ has the highest SD of 1,578; the assessed values vary between low and very high. The ‘tourism’ strategy scores at 4.5 and has a low standard deviation. According to three stakeholders pursuing ‘support of local business companies’ (S7) has “high” impact on competitiveness; However one actor estimates the impact of (S7) on regional competitiveness to be rather low.

As regards frequency of strategies, ‘tourism’ (S6) and ‘agricultural production’ (S8) are the most frequently pursued strategies, followed by ‘marketing strategies of regional products’ (S5) and ‘education strategies’ (S2). The categories ‘regional planning’ (S1), ‘infrastructure’ (S3), ‘maintenance of cultural heritage’ (S9) and ‘vertical integration’ (S10) are the least pursued strategies of landscape valorisation. Seven institutions see their strategy in the protection of nature, landscape and environment (S4).

Having a deeper look at the most frequently pursued strategies, three municipalities, two nature protection organisations and the local chambers of economy pursue the strategy ‘agricultural production’ as well as ‘tourism’. However, institutions representing tourism never pursue the strategy ‘agriculture’, while farmer organisations never pursue the strategy “tourism” for landscape valorisation. The local LEADER group focuses only on ‘tourism’ and ‘regional products’. Visualised below (see Figure 2) are the sub-networks for the most frequent strategies ‘agriculture’, ‘tourism’ and ‘marketing strategies of regional products’.

Figure 2: Sub-networks of the most frequent strategies of landscape valorisation

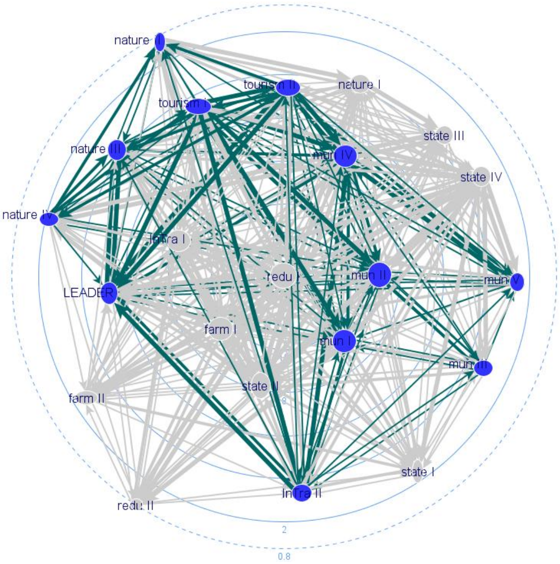


density by groups	Model 1	Model 2
in-group others	0.778	0.400
others x agricultural prod. *	0.725	0.317
in-group agricultural prod.	0.720	0.265
agricultural prod. x others**	0.825	0.275

average tie strength of existing ties	Model 1	Model 2
in-group others	1.771	2.500
'others' x 'agricultural prod.'	1.632	2.447
in-group 'agricultural prod.'	1.432	2.171
'agricultural prod.' x 'others'	1.374	2.121

*proportion of outgoing ties of group others
**proportion of outgoing ties of group agricultural production

Agricultural Production

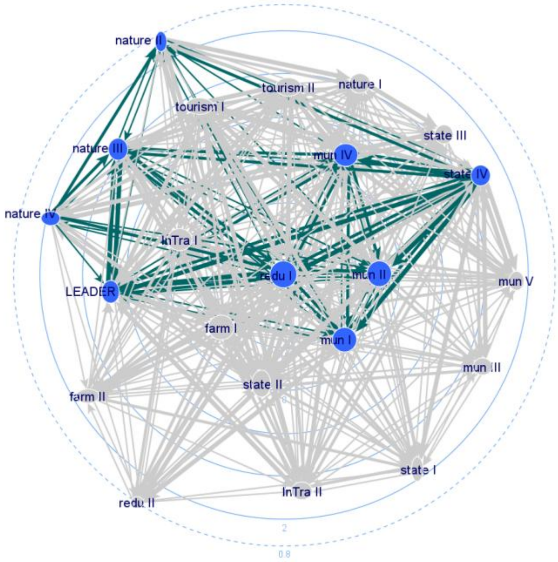


density by groups	Model 1	Model 2
in-group 'others'	0.733	0.367
'others' x 'tourism' *	0.758	0.267
in-group 'tourism'	0.735	0.273
'tourism' x 'others' **	0.808	0.342

average tie strength of existing ties	Model 1	Model 2
in-group 'others'	1.667	2.333
'others' x 'tourism'	1.450	2.281
in-group 'tourism'	1.526	2.416
'tourism' x 'others'	1.526	2.244

*proportion of outgoing ties of group others
**proportion of outgoing ties of group tourism

Tourism



density by groups	Model 1	Model 2
in-group 'others'	0.705	0.205
'others' x 'regional products'*	0.812	0.325
in-group 'regional products'	0.847	0.417
'regional products' x 'others' **	0.714	0.359

average tie strength of existing ties	Model 1	Model 2
in-group 'others'	1.355	2.219
'others' x 'regional products'	1.569	2.421
in-group 'regional products'	1.623	2.266
'regional products' x 'others'	1.659	2.333

*proportion of outgoing ties of group others
**proportion of outgoing ties of group regional products

Regional products

Also in the visualisation of the sub-networks, tie width within the sub-network represents contact intensity. The turquoise highlighted ties visualise the contacts of actors within the sub-networks ('in-group'). Grey ties visualise the contacts of the rest of actors within the network ('others'), pursuing other strategies than the sub-network. Node colour defines the sub-populations. Blue nodes pursue the respective strategy, whereas grey nodes do not. Again, node height and width are based on indegree and outdegree. Node expanse and network layout are based on betweenness centrality.

All blocking models of network model 1 show relatively high density scores within the groups as well as between the groups. However, it also becomes obvious, that the density of the sub-networks of 'agricultural production' and 'tourism' is considerably lower, than the sub-network of actors focussing on the strategy of 'regional products'.

On closer consideration, it furthermore becomes obvious, that the sub-networks 'agricultural production' and 'tourism' show higher outdegree densities than densities within the sub-network itself. The contact to the overall network for these lower-density sub-networks is consequently comparable high. For the sub-network 'regional products' the situation is contrary: Here the density within the network is considerably higher, than the density of all relations of this sub-network to the overall network.

Considering contact intensity, the average tie strengths both within the sub-networks and as regards the sub-networks relations to the overall network, are casual to frequent. Based on the results of model 1, the highest average tie strength exists within the sub-network of 'regional' products. In contrast, the lowest average tie strength can be observed for all institutions in the network that pursue strategies other than 'regional products'. The lowest average tie strength is reached within the comparatively loose sub-network 'agricultural production'. Compared to model 1, results of model 2 show lower densities. Due to the deviation criterion higher average tie strengths with the tendency to frequent contact appear.

5. DISCUSSION AND CONCLUSION

The "landscape valorisation network" analysed in this study includes representative institutions from agriculture, higher administration (federal state level), trade and industry, tourism, nature protection, research and education as well as local administration (municipality level). At this, the network appears to cover all relevant actors of the rural society (Bodin and Crona, 2009).

The connections between the different agents in the basic network of model 1 are rather dense. This high connectivity of actors can be seen as a huge potential for fostering common strategies on the one hand. On the other hand, the extremely dense network can also hinder innovation and development due to personal constraints of pushing through new strategies or due to the fact that in dense networks often a reduction of the overall knowledge base takes place (NEWMAN and DALE, 2005; GRABHER, 1993). In the 2nd LSL, stakeholders validated the strength of connection between the different actors in the study region. They also agreed that the density of the network actually can be seen not only as a regional strength but also as a problem. The analysis of the overall network further shows that in particular 1 actor, representing research and education, reaches high betweenness and degree centrality and consequently is placed in a very central position in the network. This actor's potential to spread and control information and communication is very high.

However, what becomes also obvious is that the communication frequency in the overall network ranges only between 'occasional and frequent'. Insofar the negative effect of the dense networks mentioned above could be reduced due to the overall low communication intensity. As regards the actor's capability of self-perception the results of the calculation of 'dyad-based reciprocity' indicate, that the single actors within the study region have a very clear assessment of their communication to other actors within the network. More than 70% of the dyads in the overall network are reciprocal. Comparing model 1 with model 2, in which only high intensity communication is considered, density and also dyad-based reciprocity significantly decreases.

The results of the SNA show, that the agents/institutions in the study region pursue in parts common, in parts overlapping and in parts different strategies of landscape valorisation. The most important strategies of landscape valorisation and fostering regional competitiveness in the network are 1) agricultural production 2) tourism and 3) the marketing of regional products. However, here the analysis gives hint at important interruptions in potential valorisation chains: The strategy "Agricultural production" is supported by institutions from agriculture, industry and trade, research and education, nature protection, as well as local and federal administration. However, it becomes clear that institutions representing tourism, which actually are main beneficiaries of the agricultural landscape in the study region, are not taking part in the strategical network of "agricultural production". In contrast, the strategy "Tourism" is supported by institutions from tourism, industry and trade, nature protection, as well as local and federal administration. Here agriculture, as the main supplier of the cultural services in the agricultural landscape is not included into the strategical network of "tourism". As regards "Regional products", this strategy is supported by institutions from industry and trade, nature protection, as well as local and in parts federal administration. However, again agriculture, as the main supplier of the raw products to be valorised via "regionality", as well as tourism, as one of the main potential distributer and beneficiary of the marketing of regional products, are not included into the strategical network of "tourism")

Overall, the results of the SNA indicate that within dense "landscape valorisation networks" common strategies can be developed and fostered. The results however show that for successful and efficient landscape valorisation leading to positive socio-economic effects, it is particularly necessary to close potential value chains and foster straight implementation of commonly developed strategies.

AKNOWLEDGMENTS

Work has been granted in line with the collaborative project CLAIM, funded by the European Commission under the 7thFramework Programme (call identifier: FP7-KBBE.2011.1.4-04)

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