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INTERACTIONS IN ROMANIAN AGRITOURISMS USING A NETWORK ANALYSIS

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Abstract

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Romanian countryside is characterized by small rural villages where a new generation of young farmers is able to deal with the out migration from the rural space by the agritourism. Since 2001 to 2015 there has been a significant increase of farmers diversifying their production and specialization throughout the agritourism even if this typology of tourist accommodation is unfortunately centred in few Romanian counties stand out by a significant endowment of attractions or by previous specific investments in order to implement the role and function of tourism as a stimulus of socio-economic development in Romanian rural areas. Using a quantitative approach this paper has assessed by the Social Network Analysis (SNA) the main relationships between diffusion of agritourism in Romania, specifically in 41 administrative counties, and tourism growth over 15 year time. Findings have pointed out as over the time agritourisms have arose their diffusion and rootedness in some Romanian administrative counties where arrivals and tourist accommodations are increased as a consequence of investments in human and social capital in one side and by financial supports allocated by the European Union in the other side. Nowadays, Romanian agritourisms are able to be a good change for farmers due to a rediscover of traditional food even if one of the main bottlenecks is a poor endowment of infrastructures in some scattered rural villages.

Key words: Social Network Analysis, agritourism, rural development, rural villages

Introduction

Romanian countryside is characterized by lots of small rural villages at risk of socio-economic marginalization due to out migration which is also typical of many European rural areas (Galluzzo, 2014). Comparing Italian and Romanian farms, findings have pointed out a similarity between these two countries in terms of farm size; in fact, in both countries farms with small utilized agricultural areas are predominately scattered in the rural space (Festuccia, 2014; Eurostat, 2015).

Many of Romanian farms are considered and ranked as semi subsistence farms able to produce a level of income close to 1 European Size Unit (Giurca, 2008). Agritourism or other activities able to diversify agrarian production in the rural space are strategic factor of success in the Romanian framework of socio-economic implementation of the primary sector (Bacescu-Carbunaru and Condruz-Bacescu, 2014). The Rural Development Plan has been since the early 2000s a fundamental financial tool in order to transform and re-address the role of farmers in favour of rural space protection. The Common Agricultural Policy throughout its pillar II has financed the diversification in the countryside through the agritourism in rural areas by an allocation of specific financial subsides aimed also at implementing rural diversification by other activities such as rural tourism and agritourism (Galluzzo, 2008).

Agritourism and rural tourism represent two opportunities in order to solve rural out migration and also to implement farm productive diversification strengthening the role of farmers in the rural development process and in reducing farmer's income squeezing (Van der Ploeg et al., 2002;

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Van der Ploeg, 2006). After the transition from a productivist agricultural model to a post-productivist one (Ilbery, 1998) the role of farmers is become most predominant and focused towards the environmental protection process in the countryside by the multifunctionality; hence, agritourism is nowadays considered one of the most important pillar in order to implement the multifunctionality in the primary sector, generating local rural networks, tightly connected to the local gastronomic traditions, typical food and rural crafts (Ventura and Milone, 2000). In these networks among farmers, tourists and other stakeholders with a nexus to the rurality, it is possible to discoverer lots of relationships among farmers and other tourist peculiarities able to generate a net of social direct and indirect relationships pivotal to support socio-economic development in rural areas and contrasting the marginalization in the European countryside.

In Romania more than 90% of people lives in the countryside which represents a rural area poor in public infrastructures hence, rural development plan is a good chance to solve a socio-economic dichotomy between rural and urban areas (Mursa and Parashiv, 2009). Recently, Romanian rural areas have pinpointed a significant increase of agritourisms even if these enterprises have had an utilization rate lower than other tourist enterprises although there has been a growth of arrivals from abroad (Calina and Calina, 2015). The main consequence has been a positive opportunity for farmers to make the most of traditional farms even if new innovative and labor intense enterprises, such as aquaculture farms, have taken more advantage than traditional ones of an arising agritourist accommodation demand in declining Romanian rural areas by pluriactivity and diversification in the countryside throughout financial supports allocated by national and European funds (Adrian et al., 2012; Iorio and Corsale, 2010; Naghiu et al., 2003).

After the collapse of the Communist regime in 1990 and before the enlargement of the European Union in 2007, in Romania there has been a more significant increase of demand of tourisms and agritourism in particular from international visitors coming from Germany, Italy than national tourists (Naghiu et al., 2005). According to these authors, Romanian farmers through the agritourism have been able to tackle the declining economic crisis in the countryside becoming dwellers of the multifunctionality in protecting rural space, characterised by low quality of services and infrastructures, becoming the principal partner in this transitional economy and in local rural development path.

The role and function of public administration in the framework of Romanian economic growth is pivotal in supporting the rural development by the agritourism which is important also in reducing the environmental treatments and socio-economic disparities in the primary sector and in rural areas. Agritourism and diversification in farmer's activity implement the quality of life in rural villages where are scattered small farms and agritourist enterprises even if these latter need of specific and modern infrastructures and an high level of skill and knowledge of farmers who are the sole human and productive factors able to implement the level of local workforce in the countryside (Mortan, 2005).

In 1990s Romanian farmers such as other new comers western countries did not receive after the transition from a centralised economic system to an open economic one any financial supports which implied a free competition and liberalization in their economic structures (Irina and Maria, 2012). According to these scholars, this lack of economic transition support and free liberalization have been a good starting point to implement entrepreneur's venture strengthening the rural tourism and agritourism which have absorbed unemployed workforce from other productive sectors. Nevertheless, the growth of enterprises has been much lower than other traditional tourist accommodations, such as hotel, motel and so on, due to a significant concentration of agritourisms in rural villages scattered in Romanian countryside and not in urbanized areas. Besides, reasons of this lag in diffusion of Romanian agrotourism can be identified in a scarcity in specific laws and regulation in this sector. As a consequence of the increase of demand in agritourism accommodations, a significant booming of tourism from abroad and an arising demand of local food and traditions relationships among all stakeholders in rural areas and public administrations are changed on the lights of an easy and constant growth of agritourism sector in Romania over the time (Pirnea et al., 2012). With the purpose of making the most of agritouristic demand the Romanian government planned in the early 2000s a specific master plan which connected to financial subsides allocated by the Common Agricultural Policy would have implemented specific activities in Romanian rural villages where there has been a significant diffusion of agritourism and rural tourism able to satisfy a new typology of tourists very demanding towards farmers in terms of environmental protection (Soare et al., 2011; Bogan, 2012).

Aim of the Research

Comparing different Romanian administrative units it is possible to observe an uneven diffusion of tourist structures, such as hotel, motels, agritourisms and so on able to host different tourist flows from abroad and from domestic areas in function of the presence of important tourist sites and tourist endowments (Soare et al., 2011). Agritourism is an alternative typology of tourist offer far away from traditional

structures able to promote local traditions, amenities in a perspective of regional diversification in function of leisure and recreational structures deeply rooted in Romanian rural space (Bogan, 2012).

The aim of this paper was to assess, over the time 2001-2014, using a quantitative methodology endogenous and exogenous relationships among staying time of tourists and development of agritourisms in all administrative Romanian areas using the Social Network Analysis (SNA), method proposed by Borgatti and Everett in 1997. SNA is pivotal in estimating the evolution and the dynamic of a network (Borgatti et al., 2013) which depends on the relationships and performances of each administrative units or Romanian county characterised by a significant diffusion of agritourism and by increasing tourist flows.

Methodology

Social Network Analysis depicts the social relationships among some actors, in this case Romanian administrative county where are located agritourisms which are areas characterized by significant relationships between agritourisms and tourist flows, able to create some nodes with specific power distribution (Borgatti and Everett, 1997).

The analysis of functional relationships through Social Network Analysis has taken into account connections that exist within each Romanian administrative units (node) in terms of agritourisms and in terms of collaboration and interaction among nodes. Each node can play and has two separate linkages between itself, called ego, and with other administrative Romanian units within the nation, called alter, in order to generate an ego-network, or rather a tree of relationships among nodes, which is useful to define the sociograms, that is a graph able to highlight all connections of the ego-network (Borgatti and Everett, 1997).

Main indexes obtained during the Social Network Analysis, were as follows (Borgatti and Everett, 1997; Borgatti et al., 2013; Galluzzo, 2013; Pisani and Burighel, 2014):

- size in terms of nodes pointed out in the network. It is a parameter to estimate the number of entities or rather if each ego has a link with more ego and the index is crucial to measure the size of the ego-network;
- degree or number of relationships involving a specific node. In this paper the analysis has been focused on in degree and out degree indexes and a in degree value close to 0 implies poor level of centrality or popularity;
- density, pivotal to estimate the degree of cohesion in the network. This parameter is a statistic able to describe the degree of cohesion and to point out if there is a cogent-strong connection, whose values can fluctuate from 0 to 1 in the case of maximum density of relationships. In general this index describes a proportion of all investigated nodes in the network in comparison to the total potentially number of ties in the model;
- closeness centrality is an index capable of measuring the proximity between different nodes in terms of distance made by the sum of geodesic distances of each node from all other nodes in the ego-network. The highest value of closeness points out as a node or unit of investigation is in a more or less central position;
- betweenness centrality is an useful index to assess whether there is a dominant position by a node or rather an administrative unit within the area of investigation, indicating also the impact of connector towards others;
- eigenvector centrality is a weighted unit to evaluate if the centrality of node is proportional to the sum of centralities of nodes it is a parameter useful to assess the importance of node in a network of linkages.

In our analysis we have used two approaches in order to define the dataset assessing the main relationships among Romanian administrative units.

In the first model, following partially the indications proposed by Bogan in 2012 and Soare et al. in 2011, we have identified in every Romanian administrative units or county the main relationships between these variables, which have been above the average value, such as:

- number of beds in agritourism;
- tourist staying overnight in agritourism;
- tourist staying overnight in all tourist structures;
- number of beds in all tourist structures.

We assume as in Romanian counties where the value in all investigated variables has been above the average this has implied a good position of counties in the tourist context; hence, agritourisms should be structures able to support the process of tourist development and these counties should be able also to intercept the tourist flow by lots of direct and indirect linkages. In this case an administrative unit with all four variable values above the average has obtained a value equal to 1 and 0 otherwise. In the theoretical framework every administrative unit with a value equal to 1 should have the highest concentration of rural tourist hostels and the more significant attractive ability having positive relationships to other administrative units generating, as a consequence, a network of relations.

In case of the average value has been above the average only in two variable such as number of bed in agritourism and tourist staying overnight in agritourism the model has assumed as this Romanian county has limited relationships with the adjacent and contiguous counties where are located agritourisms. In order to estimated the main interactions in SNA method data has been processed by the software Gephi.

Results and Discussions

Findings in statistical time series of tourism have pointed out a sharply increase of agritourism in Romania; this is particularly true after 2007 when this country has become a member of the European Union even if the economic crises in three year time (2009-2011) has caused a decline of more than 200 farm holidays farms (Figure 1).

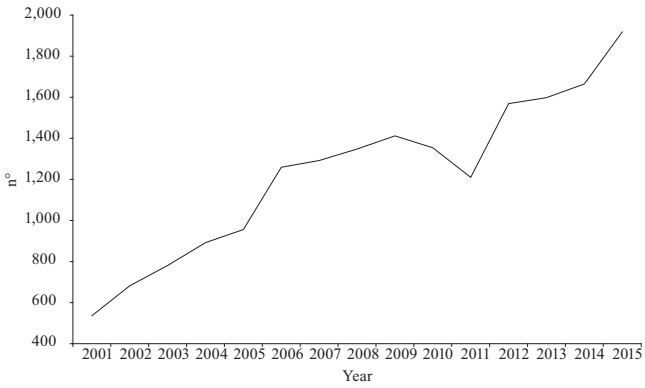

Fig.1. Evolution of agritourism in Romania in recent year (*Source*: our elaboration on data http://statistici.insse.ro/shop/?lang=en)

In the same time there has been a significant growth of arrivals and overnight staying in agritourism which has been sensitive to the economic context fluctuating over the time in function of the economic crises and its effects (Figure 2). Results have pointed out as agritourists, predominantly coming from abroad, have increased their staying time in agritourism even if time series have confirmed as in traditional domestic and international tourist circuits and villages there has been the highest concentration of agritourism and arrivals.

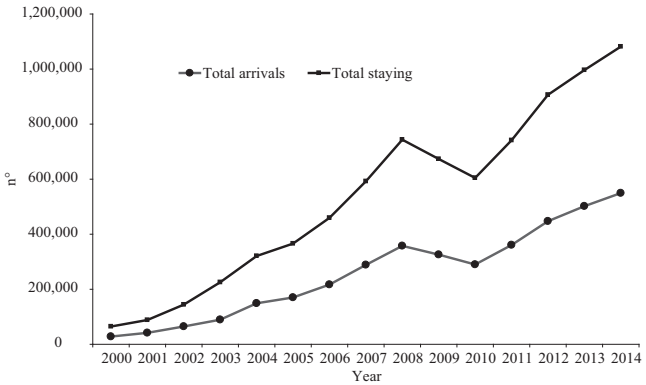

Fig. 2. Time series of arrivals and overnight staying in Romanian agritourism over 15 years (*Source*: our elaboration on data http://statistici.insse.ro/shop/?lang=en)

Table 1

Main correlations between number of agritourisms and overnight staying in Romanian agritourisms *(Source: our elaboration on data http://statistici.insse.ro/shop/?lang=en)*

County	Correlation and significance	County	Correlation and significance
Alba	0.9809 ***	Ialomita	0.1370 ***
Arad	0.9545 ***	Iasi	0.6563 ***
Arges	0.8851 ***	Ilfov	0.6938 ***
Bacau	0.2525 ***	Maramures	0.5567 ***
Bihor	0.9955 ***	Mehedinti	0.9825 **
Bistrita-Nasaud	0.8850 ***	Mures	0.9338 ***
Brasov	0.8355 ***	Neamt	0.9666 ***
Buzau	0.9326 ***	Prahova	0.9256 ***
Calarasi	-0.2298 ***	Salaj	0.8736 **
Caras-Severin	0.9674 ***	Satu Mare	0.8667 ***
Cluj	0.6515 ***	Sibiu	0.0625 ***
Constanta	0.4956 ***	Suceava	0.9112 ***
Covasna	0.8113 ***	Teleorman	0.5456 **
Dambovita	0.9002 ***	Timis	-0.0844 ***
Dolj	0.9864 **	Tulcea	-0.1291 ***
Gorj	0.8857 ***	Valcea	0.9528 ***
Harghita	0.0916 ***	Vaslui	0.9000 ***
Hunedoara	0.5586 ***	Vrancea	0.0321 ***

*** < 1%; ** 1-5%

In Alba and Bihor Romanian counties there has been the highest level of correlation between the variable agritourism farms and overnight staying considering both domestic and also foreign tourist flows in 2014 (Table 1). Findings have pointed out in 2014 as 36 counties out of 41 have agritourisms and other typologies of accommodation facilities categorized as rural tourism. Overnight staying and farm holidays farms correlated indirectly in three Romanian counties out of 38 such as Calarasi, Timis and Tulcea; in fact, these counties have pointed out a sharply decline of agritourisms and a stable flow of arrivals over the time of investigation.

The main interactions and connections among agritourisms in different Romanian counties has pointed out as in 2001 Brasov and Constanta have been the most important nodes highlighting direct and indirect exclusively connections among all Romanian counties which have implied as there are two most important nodes with the highest number of connections (Figure 3). The network in 2001 is composed by 30 nodes clustered in one only component whose only one node is characterized by weekly connections and 26 by strong connections (Table 2). Network density was 9.6% as a consequence of a poor level of cohesion and low effective relationships compared to theoretical ones. An average degree equal to 5.37 has implied a good level of centrality of these two Romanian counties; centralization index has highlighted as there are lots of nodes among Romanian counties and it does not exist a structure like a star with a unique dominant node.

In 2005 findings about the main interactions and connections among agritourisms in Romanian counties have highlighted as Constanta, Brasov, Cluj and partially Harghita have been the most important nodes in terms of direct and indirect exclusively connections among all Romanian counties. The network in 2005 is composed by 37 nodes clustered in one only component whose one node is characterized by weekly connections and 25 by strong connections (Table 3). Network density was 12% as a consequence of a poor level

Table 2
Main results of SNA index over the time of study (*Source*: our elaboration on data http://statistici.insse.ro/shop/?lang=en)

SNA index	2001	2005	2010	2014
Size	30	37	35	39
Connected components	1	1	1	1
Weakly components	1	1	1	1
Strongly components	26	25	25	27
Average degree	5.37	8.38	6.70	12.31
Centralization	0.0024	0.0037	0.001	0.0032
Density	0.096	0.12	0.102	0.166

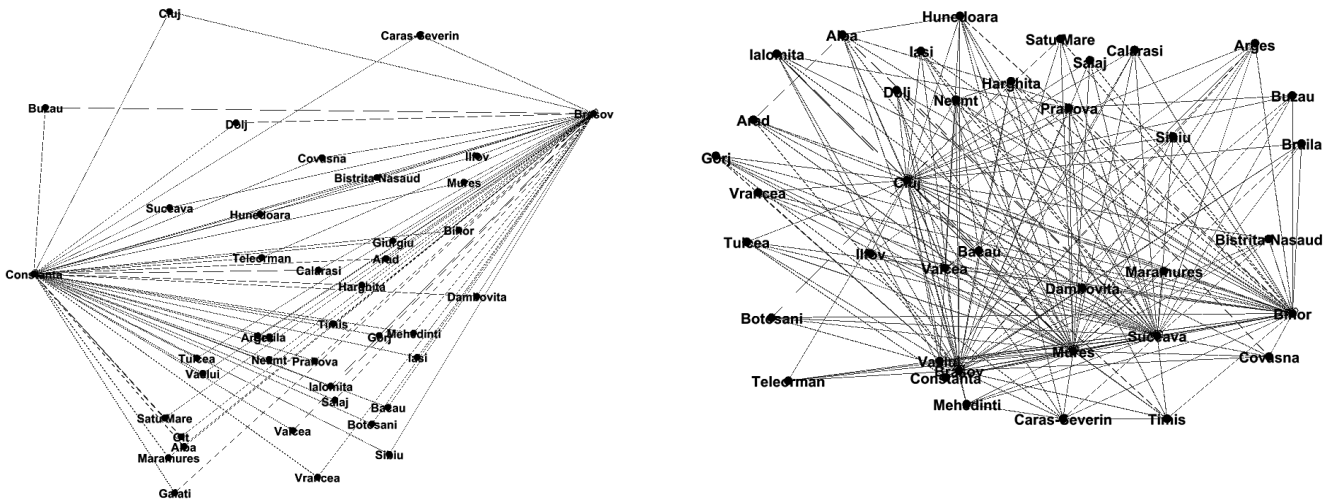

Fig. 3. Main connections in the network among different Romanian counties in 2001 (A) and in 2014 (B) (*Source*: our elaboration on data http://statistici.insse.ro/shop/?lang=en)

of effective relationships compared to theoretical ones. Centralization index has highlighted as there are lots of nodes among Romanian counties and it does not exist a structure like a star with a unique dominant node.

Findings in the graphic of interactions have pointed out an increase of Romanian counties with positive direct and indirect connections to other administrative units over the time of investigation. The network in 2010 is composed by 35 nodes in decreasing compared to previous years as a consequence of economic crises with only one cluster and a poor network density equal to 10.2% and an average degree close to 6.70 linkages and a centralization index able to assess an absence of a unique dominant node (Table 2).

In 2014 there has been an increase of interaction and connections due to 7 Romanian administrative units with direct connection to other counties (Figure 3). The network in 2014 is composed by 39 nodes, 27 of them considered strongly connected to others, in sharply increase compared to 2010 with only one cluster and a significant network density equal to 16.6% and an average degree close to 13 linkages and a centralization index able to assess an absence of a unique dominant node (Table 2).

Table 3 has pointed out as in a network of 30 nodes and the highest level of degree and popularity in Brason and Satu Mare counties which have pointed out the highest level of degree both in terms of in degree and also as out degree; Neamt,

Table 3
Main indexes of connections in SNA by node in 2001
(*Source*: our elaboration on data http://statistici.insse.ro/shop/?lang=en)

Label	Degree	In degree	Out degree	Closeness centrality	Betweeness centrality	Eigen centrality
Alba	4	1	3	0.63	0.00130	0.0050
Arad	2	0	2	0.57	0.00000	0.0000
Arges	3	0	3	0.63	0.00000	0.0000
Bacau	5	0	5	1.00	0.00000	0.0000
Bistrita-Nasaud	2	0	2	0.57	0.00000	0.0000
Brasov	29	28	1	0.60	0.05620	1.0000
Buzau	3	0	3	0.63	0.00000	0.0000
Caras-Severin	5	3	2	0.57	0.00000	0.0160
Cluj	2	0	2	0.57	0.00000	0.0000
Constanta	3	1	2	0.57	0.00000	0.0050
Covasna	4	0	4	0.83	0.00000	0.0000
Dambovita	2	0	2	0.57	0.00000	0.0000
Gorj	4	0	4	0.67	0.00000	0.0000
Harghita	9	6	3	1.00	0.03310	0.6730
Hunedoara	4	0	4	0.67	0.00000	0.0000
Iasi	3	0	3	0.80	0.00000	0.0000
Ilfov	2	0	2	0.57	0.00000	0.0000
Maramures	3	0	3	0.80	0.00000	0.0000
Mures	2	0	2	0.57	0.00000	0.0000
Neamt	7	4	3	1.00	0.00070	0.3100
Prahova	2	0	2	0.57	0.00000	0.0000
Satu Mare	28	27	1	0.50	0.00000	0.6380
Salaj	2	0	2	0.57	0.00000	0.0000
Sibiu	3	0	3	0.63	0.00000	0.0000
Suceava	5	0	5	0.86	0.00000	0.0000
Timis	3	0	3	0.63	0.00000	0.0000
Tulcea	3	0	3	0.63	0.00000	0.0000
Valcea	7	5	2	0.57	0.00000	0.0320
Vrancea	5	3	2	0.57	0.00000	0.0160

Harghita, Bacau and Suceava have highlighted the highest level of closeness among nodes and Romanian counties, correlated with the exception of Alba, to the most significant level of short pattern which has implied the highest level of power of these Romanian counties in attracting tourists even if enlarging the investigated SNA parameters as eigen centrality findings have pointed out an increase of counties able to have positive effects on the tourists flows and development of agritourism.

Findings in 2005 have highlighted as three Romanian counties such as Brasov, Cluj and Constanta have pointed out the highest level of degree and only three counties out of 36 have pinpointed the lowest level of centrality (Table 4). Maramures

Table 4
Main indexes of connections in SNA by node in 2005
(Source: our elaboration on data http://statistici.insse.ro/shop/?lang=en)

Label	Degree	In degree	Out degree	Closeness centrality	Betweeness centrality	Eigen centrality
Alba	6	6	0	0.54	0.00000	0.00000
Arad	4	4	0	0.46	0.00000	0.00000
Arges	9	5	4	0.61	0.07185	0.23820
Bacau	5	5	0	0.52	0.00000	0.00000
Bihor	8	3	5	0.44	0.00000	0.23250
Bistrita-Nasaud	4	4	0	0.50	0.00000	0.00000
Brasov	42	6	36	0.61	0.17101	1.00000
Buzau	4	4	0	0.46	0.00000	0.00000
Caras-Severin	7	3	4	0.48	0.00000	0.02990
Calarasi	3	3	0	0.44	0.00000	0.00000
Cluj	40	4	36	0.44	0.02353	1.00000
Constanta	39	3	36	0.42	0.00000	1.00000
Covasna	4	4	0	0.50	0.00000	0.00000
Dambovita	5	5	0	0.54	0.00000	0.00000
Dolj	4	4	0	0.50	0.00000	0.00000
Giurgiu	3	3	0	0.44	0.00000	0.00000
Gorj	5	5	0	0.57	0.00000	0.00000
Harghita	11	5	6	0.52	0.04874	0.23670
Hunedoara	5	5	0	0.57	0.00000	0.00000
Ialomita	4	4	0	0.48	0.00000	0.00000
Iasi	3	3	0	0.44	0.00000	0.00000
Ilfov	4	4	0	0.48	0.00000	0.00000
Maramures	6	6	0	0.54	0.00000	0.00000
Mehedinti	4	4	0	0.50	0.00000	0.00000
Mures	4	4	0	0.47	0.00000	0.00000
Neamt	6	5	1	0.60	0.00462	0.01120
Prahova	5	3	2	0.44	0.00000	0.20560
Satu Mare	6	4	2	0.46	0.00084	0.00990
Salaj	7	5	2	0.52	0.00168	0.05250
Sibiu	7	5	2	0.57	0.00336	0.00990
Suceava	7	4	3	0.50	0.00420	0.01490
Timis	6	4	2	0.52	0.02605	0.05410
Tulcea	5	3	2	0.46	0.00000	0.07310
Vaslui	5	4	1	0.46	0.00042	0.00500
Valcea	12	5	7	0.58	0.01177	0.07970
Vrancea	3	3	0	0.44	0.00000	0.00000

and Brasov have pointed out the highest level of out degree which has implied significant connections towards other Romanian counties. Brasov, Arges and Neamt have pointed out the highest level of closeness centrality instead in Vrancea, Bihor and Giurgiu findings have assessed the poorest ones, which implies a less central position in the network.

A density close to 12% has implied a low level of effective relationships compared to the effective ones (Table 2). The centrality value equal to 0.0024 has implied as all ties are relatively equally distributed over all nodes. The highest levels of betweenss centrality and eigencentrality as well have highlighted the strategic role of Bistrita, Cluj and Constanta in terms of connector and also as node in the network considering their connection and interactions among Romanian counties.

Table 5 shows in 2010 that the Romanian counties, characterized by the highest level of connections in terms of de-

Table 5
Main indexes of connections in SNA by node in 2010
(*Source*: our elaboration on data http://statistici.insse.ro/shop/?lang=en)

Label	Degree	In degree	Out degree	Closeness centrality	Betweeness centrality	Eigen centrality
Alba	12	6	6	0.75	0.05790	0.1460
Arad	4	0	4	0.63	0.00000	0.0000
Arges	8	4	4	0.56	0.01330	0.3921
Bacau	3	0	3	0.44	0.00000	0.0000
Bihor	8	4	4	0.64	0.00120	0.0671
Bistrita-Nasaud	3	0	3	0.56	0.00000	0.0000
Brasov	39	34	5	0.56	0.15510	1.0000
Buzau	3	0	3	0.44	0.00000	0.0000
Caras-Severin	6	4	2	0.42	0.00000	0.0099
Calarasi	3	0	3	0.44	0.00000	0.0000
Cluj	9	5	4	0.64	0.00340	0.0683
Constanta	5	3	2	0.42	0.00000	0.0074
Covasna	2	0	2	0.42	0.00000	0.0000
Dambovita	4	0	4	0.48	0.00000	0.0000
Gorj	4	0	4	0.48	0.00000	0.0000
Harghita	3	0	3	0.44	0.00000	0.0000
Hunedoara	5	0	5	0.65	0.00000	0.0000
Ialomita	4	0	4	0.46	0.00000	0.0000
Iasi	3	0	3	0.44	0.00000	0.0000
Ilfov	3	0	3	0.44	0.00000	0.0000
Maramures	2	0	2	0.42	0.00000	0.0000
Mehedinti	3	0	3	0.44	0.00000	0.0000
Mures	5	0	5	0.67	0.00000	0.0000
Neamt	7	5	2	0.41	0.00000	0.2562
Prahova	7	5	2	0.41	0.00000	0.2562
Satu Mare	2	0	2	0.42	0.00000	0.0000
Salaj	4	0	4	0.59	0.00000	0.0000
Sibiu	10	5	5	0.69	0.08280	0.4232
Suceava	37	34	3	0.41	0.02650	1.0000
Timis	3	0	3	0.44	0.00000	0.0000
Tulcea	3	0	3	0.44	0.00000	0.0000
Vaslui	3	0	3	0.44	0.00000	0.0000
Valcea	9	5	4	0.56	0.00350	0.2224
Vrancea	2	0	2	0.42	0.00000	0.0000

gree, are Brasov and Suceava while the lowest has been assessed in 22 out of 34 Romanian administrative units.

Considering the betweenss centrality Brasov and Sibiu have pointed out the highest value which implies as these two nodes are a relevant connector for other Romanian counties. Sibiu and Alba have highlighted the highest levels of closeness centrality but Brasov and Suceava with the highest level of eigencentrality have ratified the importance of these two Romanian counties in terms of connections able to act positively on the development of agritourism attracting other tourist flows.

Table 6
Main indexes of connections in SNA by node in 2014
(*Source*: our elaboration on data http://statistici.insse.ro/shop/?lang=en)

Label	Degree	In degree	Out degree	Closeness centrality	Betweeness centrality	Eigen centrality
Alba	13	7	6	0.71	0.0165	0.4416
Arad	7	0	7	0.68	0.0000	0.0000
Arges	10	4	6	0.71	0.0068	0.1484
Bacau	7	0	7	0.69	0.0000	0.0000
Bihor	44	38	6	0.67	0.0118	1.0000
Bistrita-Nasaud	5	0	5	0.61	0.0000	0.0000
Botosani	5	0	5	0.61	0.0000	0.0000
Brasov	46	38	8	0.77	0.0609	1.0000
Braila	6	0	6	0.63	0.0000	0.0000
Buzau	6	0	6	0.65	0.0000	0.0000
Caras-Severin	10	4	6	0.63	0.0015	0.0180
Calarasi	6	0	6	0.63	0.0000	0.0000
Cluj	44	38	6	0.67	0.0118	1.0000
Constanta	9	4	5	0.61	0.0000	0.0138
Dambovita	7	0	7	0.73	0.0000	0.0000
Dolj	6	0	6	0.69	0.0000	0.0000
Gorj	7	0	7	0.68	0.0000	0.0000
Harghita	12	6	6	0.67	0.0011	0.4493
Hunedoara	9	0	9	0.77	0.0000	0.0000
Ialomita	7	0	7	0.67	0.0000	0.0000
Iasi	6	0	6	0.65	0.0000	0.0000
Ilfov	6	0	6	0.65	0.0000	0.0000
Maramures	5	0	5	0.61	0.0000	0.0000
Mehedinti	6	0	6	0.62	0.0000	0.0000
Mures	45	38	7	0.71	0.0195	1.0000
Neamt	11	5	6	0.67	0.0004	0.2040
Prahova	10	5	5	0.63	0.0000	0.1519
Satu Mare	5	0	5	0.61	0.0000	0.0000
Salaj	5	0	5	0.61	0.0000	0.0000
Sibiu	8	0	8	0.79	0.0000	0.0000
Suceava	45	38	7	0.67	0.0305	1.0000
Teleorman	5	0	5	0.61	0.0000	0.0000
Timis	9	3	6	0.63	0.0008	0.0155
Tulcea	6	0	6	0.63	0.0000	0.0000
Vaslui	7	0	7	0.73	0.0000	0.0000
Valcea	12	6	6	0.71	0.0006	0.0920
Vrancea	5	0	5	0.61	0.0000	0.0000

Focusing the attention in 2014, findings have pointed out as the network is made by 39 nodes and only one cluster is characterized by one weekly connection and the more significant level of strong connections.

Five Romanian counties such as Brasov, Cluj, Bihor, Mures and Suceava have pointed out the highest level of degree and only seven counties out of 39 have highlighted the lowest level of centrality. Brasov, Cluj and Mures have pointed out the highest level of connections outside their counties which implies positive effects on the development of agritourisms and tourists in other Romanian counties close to these nodes (Table 6). Sibiu and Brasov have pointed out the highest level of closeness centrality which implies a more central position in the network. The highest level of betweenss centrality and eigencentrality as well have highlighted the role of Bihor, Brasov, Cluj, Mures and Suceava in terms of connector and also as node in the network considering their connections and interactions among Romanian counties.

Conclusions

As a consequence of becoming part of the European Union, Romanian counties have pointed out a significant increase of agritourism and diversification in the countryside. The economical crises in 2008 has had lots of negative impacts on the development of farm holidays farms even if the financial subsidies allocated by the Common Agricultural Policy have generated a positive turn over in farms with an increase of a younger high skilled generation of farmers.

Findings have highlighted a growth of nodes part of a wide network among Romanian countries as a direct consequence of the increase of agritourisms and tourists with positive strong connections and arising levels of linkages among counties as described by the evolution over the time of SNA index. In fact, if in 2001 Brasov, Satu Mare and Harghita have had the highest level of degree and highest concentration of agritourisms 14 years later Bihor, Brasov, Cluj, Mures and Harghita have pointed out the highest values of SNA indexes due to the significant increase in agritourisms of tourist flows specifically in some of them located in central areas of Romania and in some counties located close to the Ukrainian and Hungarian borders.

Likewise argued by Silviu et al. in 2011, this paper has pointed out as agritourism is a good change for Romanian rural areas characterised by low level of farmer's income and specifically agritourism is a positive opportunity for many counties located in North-East and South- Muntenia regions which should be able to use more efficiently financial supports allocated by the European Union in order to implement a sustainable development throughout a detailed promotion of tourism abroad and an improvement of local transports and regional infrastructures. In fact, rural areas may take positive advantages by rich tourist flows coming from abroad welling to spend a significant percentage of their budget in agritourism, passing their holidays in small villages close to famous tourist location (Silviu et al., 2011).

Towards farmers and agritourism enterprises National Development Plan in collaboration to the World Tourism Organization has allocated significant amount of financial funds aimed at implement the promotion of tourist industry, reducing bottlenecks in terms of infrastructures in the Romanian countryside (Scutariu, 2011). Findings in our paper have corroborated the hypothesis proposed by Scutariu in 2011; according to this author, in fact the agritourism has been located in Romanian quite rural areas near to famous tourist destination such as Suceava with a good asset in terms of natural and traditional resources.

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