WESTERN CHARPATHIAN RURAL MOUNTAIN TOURISM MAPPING THROUGH CLUSTER METHODOLOGY

Elena TOMA, Andreea-Cristiana LINCĂ

University of Agricultural Sciences and Veterinary Medicine, Bucharest, 59 Marasti, District 1, 011464, Bucharest, Romania, Phone: +40 21 318 25 64/232, Fax: + 40 21318 28 88; E-mail: elenatoma2001@yahoo.com, E-mail: andreea.linca@gmail.com

Corresponding author: elenatoma2001@yahoo.com

Abstract

Rural tourism from Western Carpathian Mountain was characterized in the last years by a low occupancy rate and a decline in tourist arrivals, due, beside of the direct effects of economic crises, to the remote location of mountain villages and to the low quality of infrastructure. For this reason we consider that the implementation of complex and integrated products based on tour thematic circuits represents a real opportunity to develop local rural tourism industry. The aim of this paper is to identify which is the best networking solution, based on clustering analysis. The Multidimensional Scaling Method and Hierarchical Cluster Method permitted us to demonstrate and identify the best way of clustering, and, in this way, the best route for a potential tour touristic circuit. Reported to the counties from which the villages take part, the identified cluster concentrate 57.7% of rural touristic accommodations and 65.0% of tourist arrivals, but it has an occupancy rate of only 5.9%. By implementing new complex touristic products we consider that can be assured a rise of this touristic dimension of the cluster and we propose more in depth studies regarding the profile of the potential customers.

Key words: *commercialization, price volatility, supply chain, vegetable*

INTRODUCTION

The rural tourism services from mountain areas permit to "take advantage of the mountain's resources" by "preserving ecological processes and helping to conserve the natural heritage and biodiversity" [1], but the development of this touristic sector is affected directly by the "feminized or averaging advanced age" of population [6] and especially by the "lack of investment capitals, the slow evolution of touristic infrastructure development projects and the weak promotion of touristic resources"[3]. Despite this problems rural tourism, and especially agrotourism, offer structured services very diversified based on different forms of tourism (holiday, cultural tourism, health care etc.) [2]. One important aspect remains the absence of thematic touristic or integrated products. The existence of these types of products is essential for the enhancement and promotion of rural tourism and for the improving of visibility on the market. A viable solution to implement these products is by tourism clustering which means to accumulate "tourist resources and attractions, infrastructures, equipment, service companies, other supporting sectors and administrative organism whose integrated and coordinated activities allow providing the customers with the experience they expect" [7].Identify the best way of clustering the villages with touristic activities permits the enhancement of productivity, improves competitiveness performance, stimulates the development of new businesses and permits creation of added value on the entire touristic chain. These types of clusters can implement and promote complex, thematic and integrate touristic products.

MATERIALS AND METHODS

The main purpose of our research is to identify the best way to form touristic clusters in mountain areas, and especially in Western Carpathian. The methodology we used is a step by step approach: *Step 1*-we identified the   rural   villages   situated   in   Western

Carpathian which have statistical recorded touristic activities. We realized this selection based on the villages geographical profile establish by National Research and Development Institute for Soil Science Agro-Chemistry and Environment Bucharest (NRDISSAEB) (mountain and partial mountain villages) [9] and based on the record of tourist arrivals from National Institute of Statistics (NIS). *Step 2 -* the next step was to identify through statistical methods (that permit the mapping of tourist destinations in a designated territory [4]) the number of touristic clusters in which can be grouped the selected villages based on the distanced between variables. We realized this analysis based on the methods provided by Statistical Package for the Social Sciences (SPSS), respectively: ASCAL – this method permits a visualisation of clusters through multidimensional scaling (MDS); Hierarchical Cluster Method (HCM) – this methods establish the proper number of cluster based on the proximity between villages (Centroid Linkage option). *Step 3 –* depending on the number of identified groups we will identify the village center of this clusters, respectively which village has a better dispersion. We realized this analysis based on two methods: Inverse Distance Weighted (IDW) and Average Distance Weighted (ADW) [5]. *Step 4 –* evaluation of touristic activities inside cluster periods and the principal touristic objectives that can be promoted at that region level [8].

RESULTS AND DISCUSSIONS

Western Carpathian Mountains are formed from three major distinct group of mountains (Apuseni Mountains, Poiana Ruscă Mountains and Banat Mountains) and contain 18 mountain subgroups (Culmea Codrului, Muntele Şes Mnt., Meseşului Mountains, Clujului and Dejului hills, Trascăului Mountains. Metaliferi Mountains, Muntele Mare Mnt, Pădurea Craiului Mountains, Vlădeasa Mountains, Bihor Mountains, Zărandului Mountains, Poiana Ruscă Mountains, Lipovei hills, Almăjului

Mountains, Semenic Mountains, Aninei Mountains, Dognecea Mountains, Codru Moma Mountains [10). They are from an administrative point of view spread on the territory of five counties: Alba, Arad, Cluj, Hunedoara and Sălaj.

In the areas mentioned above we identified 25 rural villages and 4 cities that present a preponderant mountain relief and which present touristic activities (Table 1):

Table 1: Cities and villages from mountain areas - western Carpathian

County	City/Rural village
Alba	Abrud City, Câmpeni City, Albac, Arieşeni
Arad	Hălmăgel, Halmagiu, Moneasa
Cluj	Băişoara, Beliş, Călăţele, Căpuşu Mare, Ciucea, Gilău, Măguri-Răcătău, Margău, Marişel, Poieni, Rişca, Săcuieu, Sâncraiu, Savadisla, Valea Ierii
Hunedoara	Brad City, Teliucu Inferior, Zam
Sălaj	Zalău, Buciumi, Meseşenii de Jos, Românaşi

Source: selection based on NRDISSAEB and NIS data

Starting from these rural villages we created a matrix of distances between localities to which we applied ALSCAL method. The multidimensional scaling permitted us to visualize possible clustering solutions (Fig. 1)
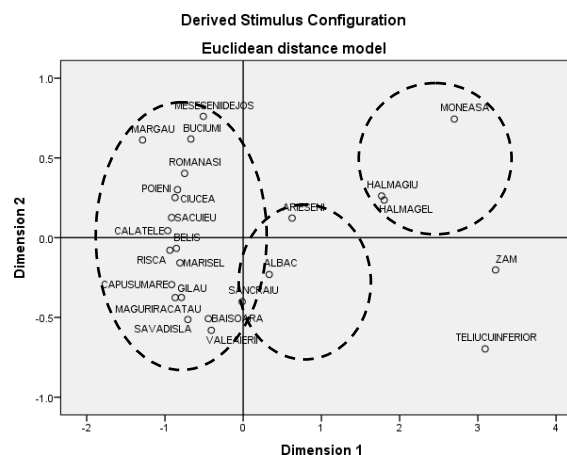

Fig. 1. Derived stimulus configuration + Euclidian distance

The ALSCAL method revealed us the possibility to group the localities in three clusters. Due to our aim to identify possible grouped touristic regions we exclude in this step the remote villages Zam and Teliucu Inferior (two villages can't form in our opinion a touristic region). In this condition we performed a hierarchical cluster analysis (HCM method) selecting the distances matrix formed by the other 23 villages.

We selected Squared Euclidean distance method of determining distance between clusters, the Centroid linkage method for clustering and the solution of three clusters. The new results obtained, based on the optimal distances show us the following distribution inside the clusters (Table 2):

Table 2: HCM – Centroid Linkage

Case	Clusters
Albac, Arieşeni	1
Băişoara, Beliş, Buciumi, Călăţele, Căpuşu Mare, Ciucea, Gilău, Măguri-Răcătău, Margău, Marişel, Meseşenii de Jos, Poieni, Rişca, Românaşi, Săcuieu, Sâncraiu, Savadisla, Valea Ierii	2
Hălmagel, Halmagiu, Moneasa	3

Source: SPPS computation

The program performed a clustering grouping based on the smallest squared Euclidian distance between villages, and then performed a recombination until the three clusters requested were obtained. The main results obtained permitted us to decide that there are another two villages that we have to exclude, respectively Albac and Arieşeni (cluster 1). The dendrogram reflecting the distances between variables can be observed as follows:
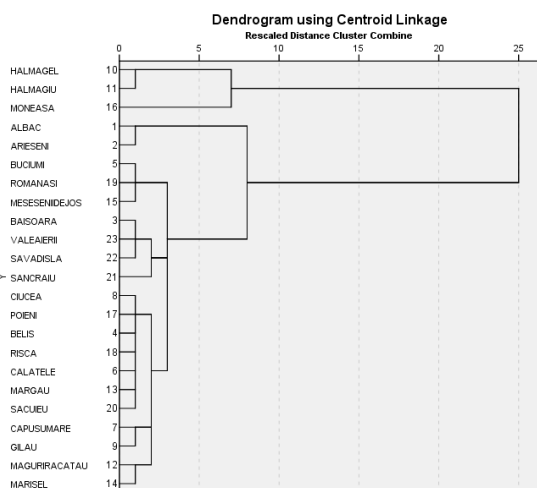

Fig. 2. Dendrogram using Centroid Linkage – Rescaled Distance Cluster Combine

We also exclude the villages grouped in cluster 3 (Hlmăgel, Halmagiu and Moneasa) because the distances between these localities are too high to create a touristic tour. In this situation we may observe that in Western Carpathian it's possible to create only one touristic region (touristic destination), formed by 18 localities.

But first we have to verify if this villages can be introduces in a tour circuit ant to calculate which locality its better dispersed. To obtain this result we applied IDW and ADW methods of calculation (Table 3):

Table 3: Inverted distances weighted (IDW) and the weighted average distances (ADW)

	IDW	ADW
Călăţele	0.033	30.6
Poieni	0.031	31.9
Gilău	0.030	32.8
Săcuieu	0.030	33.6
Căpuşu Mare	0.029	34.0
Rişca	0.029	34.2
Beliş	0.029	34.2
Ciucea	0.029	34.3
Margău	0.029	34.4
Savadisla	0.026	37.7
Măguri-Răcătău	0.024	41.4
Marişel	0.024	41.7
Băişoara	0.023	44.2
Valea Ierii	0.020	50.1
Buciumi	0.019	52.4
Românaşi	0.019	53.3
Meseşenii de Jos	0.015	68.2
Sâncraiu	0.013	74.3

Source: own calculation

The main results through this methods revealed that there are two more localities that we have to eliminate from our grouping because they are too far from the center of the cluster (Călăţele village), respectively Museşenii de Jos and Sâncraiu (for tour operators an optimum touristic circuit its dispersed on maximum 50-55 km).

In conclusion at Western Carpathian level, based on the distances between localities, can be formed a single possible cluster formed by 16 rural villages (Fig.3).

Fig. 3. Cluster mountain villages possible to integrate in a touristic tour-circuit

The touristic dimension of this optimum by proximity cluster, starting from 2012 statistical data, has the following characteristics:

Table 4: Dimension of Western Charpatian possible touristic cluster (2012 data)

Specification	MU	2012
Touristic establishments		
Agroturistic boarding houses	no	60
Share in total rural tourism - Salaj and Cluj counties	%	57.7
Share in total tourism - Salaj and Cluj counties	%	20.6
Touristic accommodation capacity in function		
Agroturistic boarding houses	no places-days	315396
Share in total rural tourism - Salaj and Cluj counties	%	55.7
Share in total tourism - Salaj and Cluj counties	%	8.5
Arrivals of tourists accommodated in the structure of tourists reception		
Agroturistic boarding houses	no	13027
Share in total rural tourism - Salaj and Cluj counties	%	65.0
Share in total tourism - Salaj and Cluj counties	%	3.9
Staying overnight in the establishments of touristic reception		
Agroturistic boarding houses	no	18544
Share in total rural tourism - Salaj and Cluj counties	%	64.2
Share in total tourism - Salaj and Cluj counties	%	3.1
Index of net using the touristic accommodation capacity in function		
Agroturistic boarding houses	%	5.9
Share in total rural tourism - Salaj and Cluj counties	%	86.7
Share in total tourism - Salaj and Cluj counties	%	36.2

Source: own calculation based on NIS data

The cluster concentrates from the total rural touristic offer of Sălaj and Cluj counties 57.7% of touristic accommodation, 55.7% of touristic capacity, 65.0% of tourists and 64.2% of staying overnights. With this dimension the cluster had an occupancy rate of only 5.9%, at 86.7% of rural tourism counties level and 36.2% of total tourism counties level. It's obvious that the touristic activities from cluster's villages need new touristic products to raise the occupancy rate, and one of these solutions is to create tour-circuits (simple tours or hop-on-hop-off tours) which will ease the access in these remote mountain areas.

CONCLUSIONS

At Western Carpathian level our statistical analyze of rural villages with active touristic activities reveal the formation possibility of only one cluster based on distances proximities. Our main results are that there are 16 villages that can be connected into a cluster which can better promote the local rural tourism activities through complex and integrated touristic products. To develop this king of products it's necessary to make more detailed studies to know the profile of tourists and to adapt to their needs. But, from an economical point of view, the best networking solution is between the villages that we identify.

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