

## TOURISTIC DESTINATIONS MAPPING METHOD FOR RURAL AREAS IN DOLJ COUNTY

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### Abstract

*The rural tourism in Dolj County represents a very important sector for the local economies, but its development is affected directly by the lack of investment capitals, the slow evolution of touristic infrastructure development projects and the weak promotion of touristic resources. The public strategies and private marketing plans are oriented only in two directions: at county or village level and at touristic objective level. We consider that for the best promotion and valorization of rural tourism any strategy or plan has to be directed at micro region level. But which are the villages that can group in a touristic destination so they can ensure a higher development of rural tourism? To respond at this question, this paper proposes a method for touristic destination mapping. Through this method we identified for Dolj County the best statistic grouping of villages that can ensure the best valorization of natural and anthropogenic resources.*

**Key words:** touristic destination, cluster analyze, cluster mapping

### INTRODUCTION

Determining the best way to group rural villages in viable touristic destinations, which can be better promoted through public and private marketing strategies, is taking based on cluster analysis. The method we propose is centered only on spatiality aspect of a territory because we consider that in the tourism sector and especially in the tourism based on travel circuits the proximity of locations is directly correlated with the object of a touristic product. In this context, our research is focused on the identification of the best clustering of rural villages inside of a touristic destination. The touristic destination mapping (cluster mapping) at Dolj County level is taking into consideration only the villages with medium, high and very high touristic potential [1] and is utilizing as central factor of clustering the type of touristic objective that can be promoted at village level (natural or anthropogenic).

## **MATERIAL AND METHOD**

The touristic destination mapping was created based on the methods provided by Statistical Package for the Social Sciences (SPSS). We utilized: ASCAL Method (Multidimensional scaling - MDS), Principal component analyses (PCA) and Hierarchical Cluster Method (HCM) - Centroid Linkage.

MDS is a statistical method utilized for graphic representations of distances (distance mapping) and was used in the context of our research to create a visual overview of structural dimension of each destination. This statistical method establishes that the distance between two or more objects is given by the proximity created by each other and the coordinate of each object is shown on the chart generated by SPSS.

PCA represents a statistical analysis method that realizes predictive models starting from data obtained by observation. This method is a tool for reducing the number of observed variables into a smaller number of principal components (artificial variables). In our case when the distance between all the villages can't be computed directly, the distances become variables expressed by normal standardized deviation.

HCM – Centroid Linkage is a statistical method that permits connections of cluster objects based on the distance between them. The core method idea is that a cluster can be defined based on the maximum distances between component parts.

After we applied the above mentioned statistical methods we obtained the number of touristic destinations from researched area and the village clustering inside each destination. So the remaining question that we needed to answer was which village has the better dispersion inside a destination. To respond at this question we utilized two methods: Inverse Distance Weighted and Average Distance Weighted. IDW and ADW represent interpolation method between objects based on inverse distances between them and are similar to the inverse distance weighed average method (Shepard Method):

$$IDW = \frac{1}{j-1} * \sum_{i=1}^j \frac{1}{D_j} \text{ and } ADW = (j-1) * \frac{1}{\sum_{i=1}^j \frac{1}{D_j}}$$

Where, D = distance between village j and all the other villages  
j = villages inside a touristic destination

## RESULTS AND DISCUSSIONS

Dolj County presents the main following characteristics: dominant forms of relief: plains and hills; river system: Jiu River and the Danube River; protected areas of national interest; the anthropogenic sightseeing (museums, festivals, archaeological sites, historical monuments, religious monuments) are concentrated in the center and north of the county, approximately radial from Craiova city (the main economic center polarizing the county); 9 rural villages with high tourist potential and 41 rural villages with average tourist potential.

The important aspect is that the medium and high potential settlements are dispersed throughout the county, making it difficult for us to identify the number and dimension of tourist destinations. For this reason, first we selected several elements to underline the main characteristic for grouping, respectively the natural and human resources categories that could become the core of future rural tourism products in the area.

In terms of natural tourism resources, it appears that in addition to scores obtained for the natural landscape of plains and hills, some villages have complementary advantages, such as protected areas or natural therapeutic factors [1]. Thereby, of the 50 villages with medium and high potential, 24 villages have direct access to natural protected areas of national interest or Natura 2000 reservations (Table 1).

Table 1

Important natural resources from Dolj County

Protected area	Village	Type
Balta Lată	Ciupercenii Noi	Protected area of national interest
Balta Neagră	Desa	Protected area of national interest
Bistre	Bistre	Natura 2000 – SPA - Special protected area
Calafat – Ciuperceni – Dunăre	Ciupercenii Noi, Desa, Piscu Vechi, Poiana Mare	Natura 2000 – SPA - Special protected area
Ciuperceni-Desa	Ciupercenii Noi, Desa Piscu Vechi, Poiana Mare, Rast	Natura 2000 – SCI - Sites of Community Importance
Complexul lacustru Preajba-Făcăi	Malu Mare	Protected area of national interest
Lacul Adună de Geormane	Bratovoe	Protected area of national interest
Lacul Ionele	Desa	Protected area of national interest
Maglavit	Cetate, Maglavit	Natura 2000 – SPA - Special protected area
Paji	Cetate	Protected area of national interest

Paji <sup>1</sup> tea halofilă Gighera	Gighera	Protected area of national interest
Poiana Bujorului din Pădurea Pleni <sup>1</sup> a	Plenița	Natura 2000 – SCI - Sites of Community Importance
Punctul fosilifer Bucovă <sup>1</sup>	Bucovă	Protected area of national interest
Răurile Desnă <sup>1</sup> ui <sup>1</sup> i Terpezi <sup>1</sup> a amonte de Fântânele	Radovan	Protected area of national interest
Rezervația ornitologică Ciuperceni-Desa	Ciuperceni Noi	Protected area of national interest
Valea Oltului Inferior	Teslui	Natura 2000 – SPA - Special protected area
Valea Rea	Radovan	Protected area of national interest
Confluen <sup>1</sup> a Jiu-Dunăre	Bratovoie <sup>1</sup> ti, Calopăr, Gighera, Malu Mare, Ostroveni, Podari, <sup>1</sup> uglui	Natura 2000 – SPA - Special protected area
Coridorul Jiului	Almăj, Bistre <sup>1</sup> , Brăde <sup>1</sup> ti, Bratovoie <sup>1</sup> ti, Bucovă <sup>1</sup> , Călăra <sup>1</sup> i, Calopăr, Co <sup>1</sup> ofenii din Dos, Gighera, I <sup>1</sup> alni <sup>1</sup> a, Malu Mare, Ostroveni, Podari <sup>1</sup> uglui, Vârvoru de jos	Natura 2000 – SCI - Sites of Community Importance

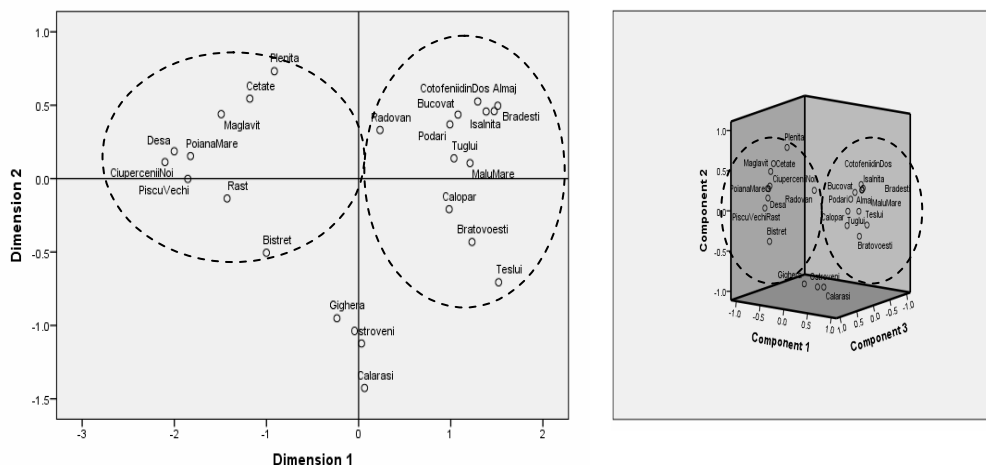
<http://www.scribd.com/doc/36645848/Arii-Protejate-Regiunea-Oltenia>

Given the direct access of these 24 cities to protected areas we consider appropriate to design tourist destinations that aim to promoting tourist products focused on these elements. The main question to be answered from which we started was: what village has the best distribution within a group in terms of proximity and which villages from proximity may be attracted inside the destination. To respond at this question we utilized the folowing statistical methods: ASCAL (Multidimensional scaling) and PCA (Principal component analyses) for the confirmation of the touristic destination's number; HCM - Centroid Linkage (Hierarchical Cluster Method) to identify the correct grouping process inside each touristic destination; IDW (Inverse Distance Weighted) and ADW (Average Distance Weighted) to determine the center village for each destination.

The first step was to identify the number of tourist destinations. Trough ASCAL and PCA methods applied on the matrix comprising the distances between the 24 villages we visually identified two main touristic destinations and we decided that the villages Ghighera, Ostroveni and Călăra<sup>1</sup>i needed to be excluded from our research (Chart 1).

Chart 1

Derived stimulus configuration - Euclidian distance and principal component analysis models



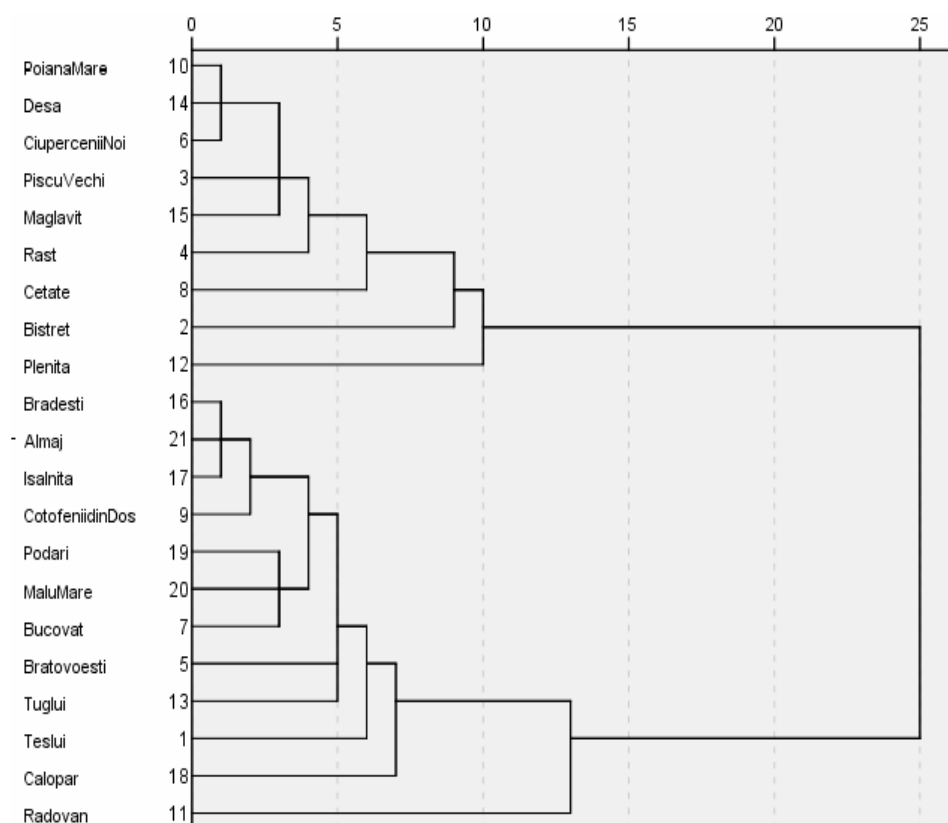
We utilized the visual results and conclusions obtained above – the possibility to create two tourist destinations concentrate to promote natural resources – and we applied the HCM method in which we selected the option for creating two clusters. This method, based on optimal distances between villages, permitted the following distribution inside the touristic destinations:

- ***Touristic Destination 1*** – Almaj, Brădești, Bratovoesti, Bucovăț, Calopăr, Coțofenii din Dos, Ișalnița, Malu Mare, Podari, Radovan, Teslui, Țuglui;
- ***Touristic Destination 2*** - Bistreț, Cetate, Ciupercenii Noi, Desa, Maglavit, Piscu Vechi, Plenița, Poiana Mare, Rast.

The graphical representation that HCM method generates is a dendrogram (a tree diagram) that illustrates the arrangements of villages inside the cluster and the connections between them (Chart 2).

Chart 2

Dendrogram using Centroid Linkage – Rescaled Distance Cluster Combine



The next step was to calculate distances by inverted distances weighted method (IDW) and the weighted average distances (ADW) between localities within each destination that enable us to identify the village with the best spatial concentration compared to other localities. Applying this methodology gives a classification of settlements (a higher IDW and a lower ADW shows that the localities are grouped). Based on this method we identify the villages Poiana Mare and Podari to have the highest spatial concentration than the other villages with access to the same natural resources (Table 2) [2]. These villages represent the center of these clusters and can be considered the best starting points for the future touristic tours inside each destination.

*Tabel 2*

Inverted distances weighted (IDW) and the weighted average distances (ADW)

	<b>IDW</b>	<b>ADW</b>
<b>Touristic destination 1</b>		
Teslui	0.020	49.8
Radovan	0.027	36.7
Bratovoesti	0.031	31.8
Calopar	0.032	30.8
Cotofenii din Dos	0.033	30.5
Bradesti	0.041	24.4
Malu Mare	0.045	22.1
Bucovat	0.046	21.8
Tuglui	0.048	20.8
Almaj	0.048	20.8
Isalnita	0.051	19.8
Podari	0.051	19.6
<b>Touristic destination 2</b>		
Bistre	0.025	39.6
Pleni	0.025	39.3
Cetate	0.035	28.4
Maglavit	0.040	25.2
Rast	0.043	23.1
Ciupercenii Noi	0.043	23.5
Piscu Vechi	0.055	18.3
Desa	0.055	18.2
Poiana Mare	0.062	16.2

Source: based on the distances from <http://www.distanta.com/>

In terms of tourist anthropogenic resources we observed that in the Dolj County we can find historical and architectural monuments, archaeological remains, folk customs and traditions that focus radial around Craiova city (Table 3) [3].

Tabel 3

## Important anthropogenic resources from Dolj County

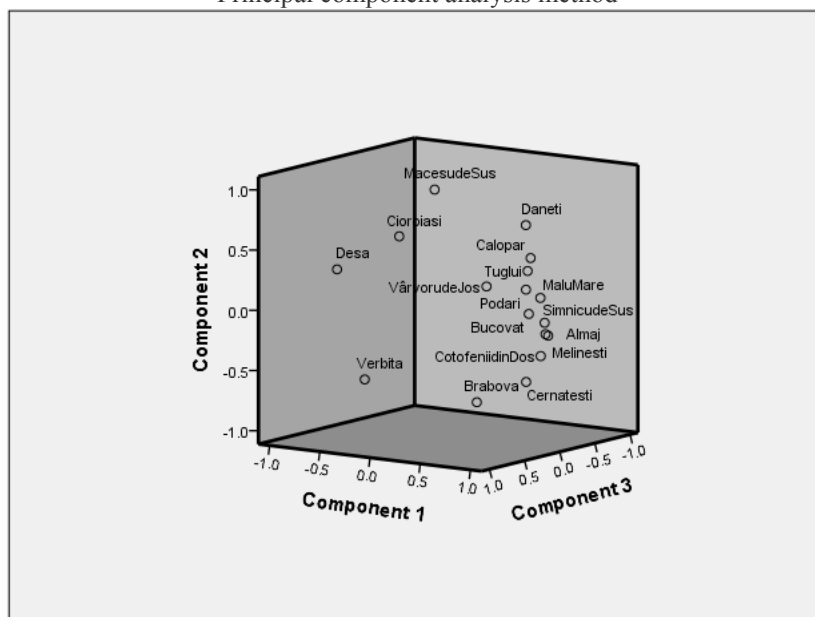
Type of resources	Village
Archaeological remains	Cioroiași
	Daneși
	Verbiș
	Bucovăț
	Coșofenii din Dos
	Simnicu de Sus
	Desa
	Calopar
Folk customs and traditions	Măceșu de Sus
	Țuglui
Historical and architectural monuments	Mălinești, Cernătești, Brabova, Malu Mare, Almăj
Religious monuments	Mălinești, Vârvoru de Jos, Podari, Malu Mare, Almăj

Sources: National Spatial Landscaping Plan (PATN)

In this case, to identify the number of tourist destinations concentrated to promote anthropogenic resources we applied the PCA method on the matrix of distances between 17 rural villages which allowed the visual formation of a single cluster (Chart 3).

Chart 3

## Principal component analysis method



We can visually observe some villages can't be grouped with the others, so we applied the IDW and ADW methods to identify which can be eliminated. By choosing to exclude the villages with IDW under 0.02 (the villages situated at over 50 km from the others) we decided that is not

optimum to include inside the destination the villages Daneșii, Măceșu de Sus, Verbiș and Desa.

Table 4

Inverted distances weighted (IDW) and the weighted average distances (ADW)

Item no.	Localities	IDW	ADW
1	Podari	0.043	23.18
2	Bucovăț	0.039	25.775
3	Tuglui	0.038	26.436
4	Malu Mare	0.034	29.133
5	Șimnicu de Sus	0.031	31.768
6	Calopăr	0.031	32.102
7	Vârvoru de Jos	0.030	33.493
8	Coșofenii din Dos	0.026	38.466
9	Almăș	0.026	38.822
10	Cernătești	0.021	46.677
11	Brabova	0.021	46.696
12	Cioroiaș	0.020	50.952
13	Melinești	0.020	51.182
14	Daneșii	0.016	60.913
15	Măceșu de Sus	0.016	62.355
16	Verbiș	0.014	70.824
17	Desa	0.012	85.218

Source: based on the distances from <http://www.distanta.com/>

Summarizing the information provided by spatial and geographical clustering tools, we conclude that in Dolj County exists a real potential for the development of the following tourist destinations:

- **Touristic destination 1** – localized in the central-east part of the county, consisting in 12 villages (Almăș, Brădești, Bratovoești, Bucovăț, Calopăr, Coșofenii din Dos, Ișalniș, Malu Mare, Podari, Radovan, Teslui, Tuglui) with proximity access to natural resources and protected areas;
- **Touristic destination 2** - localized in the south-west part of the county, consisting in 9 villages (Bistreț, Cetate, Ciupercenii Noi, Desa, Maglavit, Piscu Vechi, Pleniș, Poiana Mare, Rast) with proximity access to natural resources and protected areas;
- **Touristic destination 3** - localized in the central-east part of the county, consisting in 13 main villages (Podari, Bucovăț, Tuglui, Malu Mare, Șimnicu de Sus, Calopăr, Vârvoru de Jos, Coșofenii din Dos, Almăș, Cernătești, Brabova, Cioroiaș, Melinești), with proximity access to historical, architectural and religious monuments, archaeological remains, folk customs and traditions.



## **CONCLUSIONS**

The methods that we propose in this paper for mapping the tourist destinations in a designated territory permitted us to highlight three areas with a high touristic potential which can be promoted through rural touristic product and also the correct association between villages in case of the implementation of a package tour. The touristic destinations identified have the following characteristics: two are concentrated on natural resources (12 villages in first destination and 9 in the second destination) and one concentrated on anthropogenic resources (13 villages).

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