WEST UNIVERSITY OF TIMISOARA
FACULTY OF CHEMISTRY, BIOLOGY AND GEOGRAPHY
DEPARTMENT OF GEOGRAPHY

GEOGRAPHICA TIMISIENSIS

Vol. XXIII, nr. 2, 2014
TIMISOARA
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ALTERNATIVE
MAILING ADDRESS :
EMAIL
ONLINE: http://www.geografie.uvt.ro/old/cercetare/publicatii/geographicatim.htm

ISSN – L: 1224 – 0079
ISSN (on – line): 2248 – 1877

Geographica Timisiensis is included in Ulrich’s Periodicals Directory and in EBSCO International research databases
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TYPES AND FORMS OF TOURISM BASED ON NATURAL AND ANTHROPIG TOURIST RESOURCES IN APUSENI MOUNTAINS
CASE STUDY: RURAL MOUNTAIN AREA OF CLUJ COUNTY

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Abstract: This paper focused on identification, quantification and classification of tourist resources pertaining to natural tourist fund and purpose-built tourism patrimony in order to establish the main forms of tourism which can be practiced within the rural mountain area of Cluj County. By providing a general overview of the primary tourism supply the article aimed to highlight and promote the tourism potential related to the study area whose rural and mountain features ensured a unique combination of tourist attractions capable of sustaining the unfolding of 18 different tourism forms.

Keywords: attractive elements, natural tourist fund, anthropic tourism patrimony, tourism potential

1. INTRODUCTION

Needless to say, the development of tourism forms within an area is closely connected with attractive factors. However, not only the existence but also the particularities of these elements, along with the possibilities of exploiting them, provide each destination with a unique tourism supply. On this line, Apuseni Mountains stand out through the complexity of their tourism potential, integrating a wide range of attractive resources responsible for the tourism phenomenon existence. The characteristics of these resources which ensure a great variety of landscapes and tourism forms, not only that allow valorisation all year long (Glăvan, V., 2000), but they also turn Apuseni Mountains into a „classical area for international tourism” (Surd, V., 2008, p. 115 apud. Borza, Al.).

Under these circumstances, over the past decades, several authors have shown their interest in studying this mountain sector belonging to the Western Carpathians, both geographically and touristically speaking: Munții Apuseni (Pușcariu, V., 1937), Munții Apuseni (Ilie, M., 1957), Munții Apuseni: muzeu istoric și pantheon al poporului român (Netea, V., 1977), Turism rural în Munții Apuseni (Petrea, R., 2004), Unitățile de relief ale
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Although researches regarding the area of interest of the present paper equally refer to subdivisions of the Apuseni Mountains (i.e. Trascău Mountains, Gîlău Mountains, Muntele Mare, Bihor and Vlădeasa Massif) and to Cluj County’s general features (mainly the case of some monographies written by: Morariu, T., and Savu, Al., 1970; Molnar, E., 1972; Simedrea, T., 1972; Anton A. et. al., 1973; Buta I. et. al., 1980; Negucioiu A. et. al., 1980; Simon, A., 2003; Pop, Gr. P., 2007; Cocean, P., 2008; Stoica, L., 2008 etc.), their approach tends to be a global one, offering a holistic perspective of the analysed aspects.

This is where this article brings its contribution, making the process of highlighting the unrepeatable combination of natural and anthropic tourist resources related to the rural mountain area of Cluj County, the main purpose of the study. Although, in the end, a general overview of the primary tourism supply is provided, along with valorisation opportunities in terms of recreational and cultural activities and forms of tourism, the final result is nothing else than a complex „puzzle” composed of 26 pieces illustrating the tourism supply of each commune belonging to the examined territory. Through graphical representations, which reveal the situation of the tourist phenomenon corresponding to the rural mountain area, in a comparative manner, both general and peculiar conclusions have be drawn, allowing global and specialised observations regarding the subject.

Fig. 1. The geographical position and relief of the studied area
To be more specific about the study area, it is worth mentioning that the 26 integrated units had been selected either for the totally overlapping of Apuseni Mountains, or for the partially occupancy of the mountain sector (Fig. 1.). By taking into account both physico-geographical and territorial-administrative criteria resulted a strip with a variable extension imposed by the distance of the mountain units and the limits of the investigated communes, which has been also analysed within this research.

2. THEORY AND METHODOLOGY

As it was stated before, tourism owes its existence and evolution to attractive elements whose qualitative, quantitative and locational features have allowed tourism valorisation and consumption to happen (Cocean, P. and Dezsi, Şt., 2009, p. 19). On this line, relying on three major components: resources, infrastructure and product, the tourism supply has emerged (Dezsi, Şt., 2006, p. 6). Independently of their origin, all tourist resources (natural, human-made, cultural and socio-economic) can benefit from specific planning and management, providing thus a certain functionality to the territory they are situated in (Glăvan, V., 2000; Cândea, M. and Șimon, T., 2006). Nonetheless, all these elements, that converted into tourist attractions or resources for the tourism industry, due to their quantitative, aesthetic and cognitive value, form the primary tourism supply (Dezsi, Şt., 2006; Cocean, P. and Dezsi, Şt., 2009).

Most authors consider this concept to be a synonym of the tourism potential, incorporating only natural and anthropic resources (Erdeli, G. and Istrate, I., 1996; Glăvan, V., 2000; Muntele, I. and Iațu, C., 2003; Dezsi, Şt., 2006; Cândea, M. and Șimon, T., 2006; Ciangă, N., 2007; Ielenicz, M. and Comănescu, L., 2009). However, other researchers invest the tourism potential with more complex structure including not only tourist attractions, but also tourism infrastructure and services, meaning the holistic tourism supply (both primary and secondary) (Cocean, P., 2007; Cocean, P. and Dezsi, Şt., 2009; Păcurar, Al., 2009). The controversy continues with the definition of tourist fund (Păcurar, Al., 2009, p. 25) and tourism patrimony (Cocean P. and Dezsi, Şt., 2009, p. 22) that some associate with the primary tourism supply, whereas others retrospect to them as synonyms of the entire supply (Cocean, P., 2007; Ielenicz, M. and Comănescu, L., 2009; Păcurar, Al., 2009).

Yet, within this paper, which does not refer to the material and technical base, the tourism potential strictly refers to natural tourist fund, composed of morphological, climatic, hydrographic and biogeographic tourism potential (Ciangă, N., 2007) and to human-made and purpose-built tourism patrimony, consisting in anthropic resources such as: historical vestiges, religious and cultural buildings, monuments and even economic constructions endowed with attractive function (Cocean, P., 2010).

This wide range of attractive resources have generated both travel motivations and leisure time spending possibilities (Ciangă, N., 2007, p. 182), whose materialisation remained in accordance with the human needs of recreation, recuperation and culturalisation (Cocean, P. and Dezsi, Şt., 2005, p. 8; Cocean, P., 2007, p. 191). Thus, based on these necessities, four types of tourism emerged: recreational, cultural, curative and polyvalent (Cocean, P. and Dezsi, Şt., 2009, pp. 213-217) and other numerous forms of tourism, more or less common, such as: gastronomic (culinary), hunting and fishing, business, genealogic,
Types and forms of tourism in Apuseni Mountains. Case study: Cluj County- rural area

heritage, educational, garden, vinicultural, pop cultural, vacilando, exclusive, empathic, extreme, hobby, perpetual, pilgrimage, shopping, ecotourism, speleological (speleotourism), cyclotourism (mountain biking), tourism connected to extreme sports etc. (Gherțoiu, D.M., 2014).

With respect to Apuseni Mountains, several forms of tourism have encountered favourable conditions for development, most of them related to the recreational type: mountain hiking and trekking, winter sports, mountaineering, speleotourism, hunting and fishing (Ielenicz, M. and Comănescu, L., 2009, p. 291; Cocean, P., 2010, p. 209), accompanied by possibilities of practicing curative (balneary and climatic) and cultural tourism. The latter is also associated with the northern part of Transylvanian Depression, the equivalent of the marginal contact strip which this paper examines too, bringing into prominence not only the ethnographic side, valorised through rural tourism (Petrea, R., 2004; Ciangă, N. şi Dezsi, Şt., 2007; Ielenicz, M. and Comănescu, L., 2009; Cocean, P., 2010), but also other resources exploited through religious tourism, hunting and fishing, balneary tourism, weekend tourism and transit tourism (Ielenicz, M. and Comănescu, L., 2009, p. 391).

More recent studies, comprised within some doctoral theses more or less focused on the study area of this paper, present a complex framework concerning the types and forms of tourism that can be practiced both within the mountain area and within the marginal one. On this line, results of the researches made in Trascău Mountains as part of the Apuseni Mountains (Cocean, G., 2011) – partially integrated within the examined territory – and Iara-Hăşadate Depression (Moldovan, S.C., 2014) – totally incorporated within this investigation – can be successfully extrapolated to the situations where relief units or administrative units have similar tourist resources.

Thus, although in the former case some forms of tourism have already been mentioned before (mountaineering, mountain hiking and trekking, speleotourism, hunting and fishing, religious or rural tourism), new ones are also illustrated, as follows: cyclotourism, canyoning, paragliding, tourist overflights, curative tourism (the „cold cure”), ecotourism, geotourism (Cocean, G., 2011). The second case tends to reveal a more classical structure of the tourism practicing possibilities whose representative activities mainly consist in the ones previously established: wintry recreation tourism (winter sports, bob, sledging, ice-skating), speleotourism, mountaineering, hiking and trekking, hunting, recreational fishing, extrem tourism (paragliding, motocross, cyclotourism, rafting etc.), rural tourism, religious tourism, scientific tourism, events tourism and transit tourism (Moldovan, S.C., 2014).

Regarding the methodology corresponding to data collection and processing, what should be noted is that both methods and techniques that were used have been selected in accordance with the quantitative nature of this research. Thus, the observational and the analytical method facilitated the identification, quantification and classification of the tourist resources whose synthetic representation was mediated by comparison, cartographic, statistical and mathematical techniques. Hence, the investigation’s results were illustrated within charts, graphics, maps and tables that valorise the information found in bibliographic materials (e.g. Romania’s Geographical Encyclopaedia, Cluj County’s monographies) and official websites (e.g. www.cjcluj.ro, www.ghidulprimariilor.ro, www.acorcluj.ro etc.).
3. RESULTS AND DISCUSSIONS

3.1. Natural tourist fund

3.1.1. Morphotourist component and related tourism forms

Regardless of the landforms’ characteristics, the relationship between tourism and relief, invest the latter with a triple contribution to configuration of the tourism supply: attractive resource, physical support and landscape background for all tourist activities (Cocean, P. and Dezsi, Şt., 2005, p. 13). However, due to the fact that the examined mountain sector unfolds both totally and partially over the inland of the 26 communes proposed for this study, resulted a marginal contact area that also comes into notice of these research. Therefore, the morphotourist component divides itself into the mountain area, composed by: Vlădeasa Mountains, Gilău Mountains, Muntele Mare Massif, Trascău Mountains, Plopiş Mountains and Meseş Mountains; and the marginal area, formed of: Feleac Massif, Huedin Depression, Căpuş Couloir, Săvădisla Depression, Iara Depression, Turda-Câmpia Turzii Depression (Morariu, T., and Savu, Al., 1970; Anton A. et. al., 1973; Buta I. et. al., 1980; Negucioiu A. et. al., 1980; Badea, L., 2006; Pop, Gr. P., 2007, Cocean, P., 2008).

In Figure 1, one can notice the predominace of Gilău Mountains, that hold the greatest share of the mountain subdivisions and as well of the entire territory (15 percent), occupying important parts of the surface belonging to 8 administrative units. Next in line, Huedin Depression, possesses 13 percent of the study area and with the 7 communes partially claimed, outperforms Vlădeasa Mountain and Feleac Massif, both units with approximately 11 percent and 6 communes held. As it is shown in Figure 2b, the smallest number of shares pertain to Căpuş Couloir, Săvădisla Depression and Plopiş Mountains whose tourist resources are least numerous and attractive.

Besides the structural and aesthetic features of this component, what is also worth mentioning is the protected natural areas category integrated within the study area, whose contribution to the tourism potential value is certified by the development of specific tourism forms. According to Association of Communes of Romania, when it comes to the morphological tourist attractions, the examined territory is provided with 6 natural areas of national interest (Corabia Quarry, Turenilor Gorge, Turzii Gorge, Big Cave from Firei Valley, Ponorului Stone Cave and Vârfuraşu Cave) and 14 natural areas of county interest (Borzeşti Gorge, Dumitresci Gorge, Ocolişelului Gorge, Păniceni Gorge, Arieşului Defile, Hăşdateilor Defile, Surduc Defile, Răcătăului Defile, Someşul Cald Defile, Someşul Rece Defile, Băşorii Mountain, Vlădeasa Mountain, Bănişorului Stone and White Stones).

As it was stated before, these tourist resources sustain different forms of tourism amongst whom the most famous continue to be: leisure tourism, hiking and trekking (including sightseeing), cyclotourism, adventure tourism, mountaineering, speleotourism, sports tourism (winter sports), camping, rest and recreation.
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Fig. 2. Relief units in the study area (a) and their share within the morphotourist component (b)
3.1.2. Climatic tourist component and related tourism forms

The second component of the natural tourist fund is meaningful for this study on the basis of its bioclimates – subordinated to the temperate continental climate (Morariu, T., and Savu, Al., 1970; Anton A. et al., 1973; Buta I. et al., 1980; Neguicioiu A. et al., 1980; Pop, Gr. P., 2007) – which can be exploited by tourism forms like climatic tourism and rest and recreation (relaxation). While the former is related to mountain stimulent-tonic bioclimate, manifested between 800 and 1900 meters altitude, the latter is usually associated with the submontane neutral-sedative bioclimate, located at an elevation higher than 300 metres and lower than 700 metres, or in other words, in the hills and depressions domain (Ciangă, N., 2007; Cocean, P., 2010).

As shown in Figure 3, the mountain stimulent-tonic bioclimate holds 50 percent of the investigated territory, being recommended for the treatment of anemia, neurosis, convalescence, endocrine disorders and pulmonary diseases (Ciangă, N., 2007, pp. 74-75); whereas the submontane neutral-sedative one, known for the moderate character of the climatic elements, is suitable for all kinds of people due to its lack of contraindications (Cocean, P., 2010, p. 49). Consequently, those who take full advantage of its benefits are usually persons who do not endure extreme weather and climate changes, such as elderly people and those who suffer from advanced heart diseases, convalescents and even young children with nervous condition (Ciangă, N., 2007, p. 72).
3.1.3. Hydrographic tourist component and related tourism forms

Another component of the natural tourist fund which plays a major role within the tourism potential and supply of a destination, sometime more significant than the relief itself (Cocean, P. and Dezsi, Şt., 2005, p. 21), is the hydrographic one. It enjoys quite a dense representation within the rural mountain area of Cluj County as well, including over 80 resources that support not only leisure tourism activities, but also more specific ones such as fishing tourism and nautical sports (water skiing, sailing and boating) vindicated by sports tourism. With a share of 56 percent, rivers prove their supremacy over the other hydrographic elements, being present in each commune of the examined ones. Differentiated by the importance of range (high, medium, low), these rivers belong to the hydrographic basin of Someş, Arieş and Crişul Repede (Morariu, T., and Savu, Al., 1970; Buta I. et al., 1980; Negucioiu A. et al., 1980; Pop, Gr. P., 2007) whose tributaries are best represented in Ciurila, Petreştii de Jos, Negreni and Tureni. Two of these territorial-administrative units, namely Tureni and Ciurila, also come into prominence due to the best representation of stock pounds and due to the greatest variety of hydrographic resources that happen to be the most numerous within the area of interest (Fig. 4).

Other attractive tourist factors correspond to the water storages, hosted by Gilău (Tarniţa Water Storage), Mărişel, Râşca (Fântânele Water Storage), Beliş, Poieni (Drăgan Water Storage) and of course, the waterfall category with its well-known exponent Râchiţele Waterfall from Mărgău (Pop, Gr. P., 2007). All these examples equally stand for the protected natural areas of county interest which also subjoin Bondureasa Water Storage, Gilău Water Storage, Someşul Cald Water Storage, Vişagului Meadow – Drăganului Valley, Câpuşului Valley, Ierii Valley, Someşului Rece Spring and Râcătăului Valley, Someşului Rece Valley and Şoimului Valley.
3.1.4. Biogeographic tourist component and related tourism forms

The last component of the natural tourist fund, packs both flora and fauna, which from now on will be referred as storey of vegetation, including related species of plants and animals. The climatic and morphological characteristics of the rural mountain area pertaining to Cluj County generated the existence of five storeys of vegetation: forest steppe, broadleaf forests, mixed forests, coniferous forests and subalpine vegetation (Fig. 5.). As it is pointed in the graphical representation below, the broadleaf forests swim at the top due to their 30 percent share, closely followed by forest steppe which occupy almost one-quarter of the total surface of the examined territory. The combination of this two storeys of vegetation can be found within the inland of 11 communes, while other administrative units get to incorporate four or even all five storeys, such as Băişoara (Fig. 5b.). Not to mention the fact that the biogeographic component prides itself with an important national interest protected natural area (Deer’s Valley) and four others of county interest (Big Peat Bog from Izbuc, Câpăţâni’s Peat Bogs, Dumbrava Brook and Apuseni Nature Park) which also concur on the development of certain tourism forms like: leisure, ecotourism and hunting tourism.
3.2. Human-made and purpose-built tourism patrimony

3.2.1. Historical buildings and related tourism forms

In order to gain a better understanding of the historical edifices’ configuration, this category splits into archaeological vestiges and historical buildings with habitat function.

Thus, with a total number of 206 resources, the archaeological vestiges bring together 17 different types of elements, upholders of the historical (archaeological) tourism. By far, the greatest share pertain to the human settlements (49 percent) whose presence was detected within the inland of 14 territorial units, with the largest number corresponding to Moldovenesti and Tureni, which also distinguish through the best typological representation (Fig. 6b.). These two communes also possess the most numerous archaeological sites, which come second in line within the vestiges category with a share of 17 percent, followed by towers, tumulus and fortified settlements, best represented in Gilău.
Concerning the *historical buildings with habitat function*, four classes stand out: manors, castles, palaces and houses which altogether sum up 21 resources out of which 19 were declared historical monuments (H.M.). As it can be observed in Fig. 7, the manors dominate this category of historical buildings due to the 9 exemplars located within the inland of six communes. Thus, while Iara hosts most manors, Ciucea and Gilău individuate through the two types combination. Last but not least, it is worth mentioning that Mihai Viteazu is the only territorial-administrative unit having a palace which along with the other three classes of constructions, allow the deployment of *heritage tourism* within the rural mountain area of Cluj County.
3.2.2. Religious buildings and related tourism forms

The most consistent component of the anthropic tourism patrimony, the religious buildings, owns 238 resources, distributed in each of the 26 investigated communes. With a total number of 229 ecumenical edifices, the churches’ class consists of 10 typological groups according to the religious cults (Fig. 8a.). The charts below, show the predominance of orthodox churches over all identified constructions, followed by baptist and reformed churches which conjunctly sum up 21 percent of total religious buildings. From a quantitative point of view, they are best represented in Iara, Câpușu Mare, Moldovenești and Tureni, which hold over 15 churches each, the last commune being the possessor of the best typological categorisation with 7 different kinds of religious cults.

Besides, the study area is provided with other two classes of ecumenical edifices: schituri (2: in Măguri-Râcătau and in Valea Ierii) and monasteries (7: in 7 administrative units) which together with some of the mentioned-above churches enable the unfolding of religious tourism, and even heritage tourism, concentrated on those constructions that have acquired the status of historical monuments (59 religious buildings).
3.2.3. Cultural buildings and related tourism forms

Initiator of the cultural tourism, this component of the human-made tourism patrimony related to the rural mountain area of Cluj County refers to the 37 quantified museums, collections and monuments identified within the examined territory. The elements of the last category, that hold 81 percent of the total number, are best represented in Ciurila, followed by Aiton and Călățele, whereas the museums class, whose existence can be observed within the inland of 6 communes, claims a share of 16 percent of the cultural buildings (Fig. 9.). It is worth mentioning that the collection from Ciucea is an ethnographical one and the museum located in the same commune is the only memorial one in the study area, while the other museums are all related to the traditional Romanian village life (4 village museums and one arts museum in Săvădisla). Last but not least, the monuments also can be classified into four categories: heroes monuments (21 exponents), monuments dedicated to some important personalities (7 exemplars), a mausoleum and a troiță. The last two were include here due to their historical monument status, also valid for the case of the memorial museum and for the two monuments from Mărișel.
3.2.4 Other tourist resources

The final category of tourist resources pertaining to the purpose-built patrimony has such a heterogeneous structure that it does not have a specific name and under the title of „others” lies five types of attractive factors: an astronomical observatory, a horse riding center, a zoological park, ski slopes and tourist resorts (Fig. 10.). By far, the 10 ski slopes rule this category, putting Bâşiţoaia on the map due to the greatest number of ski runs (5) and to the major importance venue in terms of winter sports and proven climatic therapeutic benefits that this commune hosts. Along with Beliș-Fântânele Resort and Valea Drăganului Tourist Complex, Muntele Băișorii Resort enrich the tourism supply of the rural mountain area belonging to Cluj County, being responsible for attracting tourism flows.
3.3. Types and forms of tourism and related tourism potential value

Just by putting together all the different pieces of the tourism forms „puzzle” that were previously associated with the components of the natural tourist fund and anthropic tourism patrimony, a whole new perspective emerges, offering the chance to envision the primary tourism supply related to the rural mountain area of Cluj County. Hence, as it is illustrated in the following chart, leisure and recreation activities benefit from the largest number of resources which convert into authentic pillars of the tourism forms that they induce (Fig. 11.).
Concurrently, Figure 11, facilitates comparisons between all the identified tourism forms, their share and their occurrence frequency amongst the practicable activities which were mentioned within 3.2. and 3.1. subchapters. Under these circumstances, 8 classes of tourism forms take shape, ranked from most to least encountered and developed within the study area, as following:

- **Ist class**: leisure, hiking and trekking, cyclotourism, camping, rest and recreation, rural tourism, religious tourism;
- **IInd class**: ecotourism, historical (archaeological) tourism, heritage tourism;
- **IIIrd class**: cultural tourism;
- **IVth class**: adventure (extreme) tourism;
- **Vth class**: fishing tourism;
- **VIth class**: sports tourism (winter, nautical);
- **VIIth class**: climatic tourism, hunting tourism;
- **VIIIth class**: speleotourism, mountaineering.

Next, if we were to consider the number of these activities as a pertinent indicator for the tourism potential value of each commune of the 26 investigated, the situation for every territorial-administrative unit from the rural mountain area belonging to Cluj County, would be identical with the one represented in the following chart (Fig. 12).
According to the above graphical representation, a hierarchy can be established as well, this time showing the category of tourism potential whose value was rated from 0 to 5 points, or in other words revealing the situation of each commune, from the ones possessing an excellent potential, to those with a deficient potential, hereunder presented:

- 5 pt.: very high potential – Mărgău and Poieni;
- 4 pt.: high potential – Beliş, Mihai Viteazu, Petreştii de Jos, Tureni;
- 3 pt.: medium-high potential – Băişoara, Gilău, Măguri-Răcătău, Mărişel, Râşca;
- 2 pt.: medium potential – Ciurila, Feleacu, Moldoveneşti, Sâncraiu;
- 1 pt.: low potential – Aiton, Călăţele, Căpuşu Mare, Ciucea, Iara, Sânduleşti, Valea Ierii;
- 0 pt.: very low potential – Mănăstireni, Negreni, Săcuieu, Săvădisla.

Thus it can be stated that over 50 percent of the examined communes pride themselves on medium to very high values related to the tourism potential and even those which turned to be low rated, still ensure proper conditions for performing 10 different forms of tourism (Fig. 12.).
4. CONCLUSION

By analysing each component of the primary tourism supply along with its attractive resources and induced forms of tourism, that can be practiced within the study area, this research has brought to prominence the specificity of the tourism supply corresponding to the rural mountain area of Cluj County, fulfilling all its initial goals. Thus, in order to sum up the results and conclusion of the presents study, a synthetic table should be more than relevant, reason for why the final lines will be dedicated to reviewing all 18 forms of tourism associated with the 8 analysed components of the tourist fund and patrimony which make the examined territory a unique one in terms of tourism potential configuration and valorisation (Table 1):

<table>
<thead>
<tr>
<th>Primary tourism supply</th>
<th>Components</th>
<th>Tourism forms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural tourist fund</td>
<td>Morphotourist component</td>
<td>leisure, hiking and trekking (plus sightseeing), cyclotourism, adventure tourism, mountaineering, speleotourism, sports tourism (winter sports), camping, rest and recreation</td>
</tr>
<tr>
<td></td>
<td>Climatic tourist component</td>
<td>climatic tourism, rest and recreation (relaxation)</td>
</tr>
<tr>
<td></td>
<td>Hydrographic tourist component</td>
<td>leisure, fishing tourism, sports tourism (nautical sports: water skiing, sailing and boating)</td>
</tr>
<tr>
<td></td>
<td>Biogeographic tourist component</td>
<td>leisure, ecotourism, hunting tourism, fishing tourism</td>
</tr>
<tr>
<td>Anthropic tourist patrimony</td>
<td>Historical buildings (227 resources)</td>
<td>historical (archaeological) tourism, heritage tourism (H.M.)</td>
</tr>
<tr>
<td></td>
<td>Religious buildings (238 resources)</td>
<td>religious tourism, heritage tourism</td>
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<tr>
<td></td>
<td>Cultural buildings (37 resources)</td>
<td>cultural tourism</td>
</tr>
<tr>
<td></td>
<td>Other tourist categories (16 resources)</td>
<td>leisure, sports tourism (winter sports, nautical sports), climatic tourism, rest and recreation (relaxation), cultural tourism</td>
</tr>
</tbody>
</table>

**ACKNOWLEDGEMENT**

This work was possible due to the financial support of the Sectorial Operational Program for Human Resources Development 2007-2013, co-financed by the European Social Fund, under the project number POSDRU/159/1.5/S/132400 with the title „Young successful researchers – professional development in an international and interdisciplinary environment”. 
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Types and forms of tourism in Apuseni Mountains. Case study: Cluj County- rural area


## APPENDIX

### Table 2. Natural tourist fund and related attractive resources

<table>
<thead>
<tr>
<th>Crt. No.</th>
<th>Commune</th>
<th>Morphotourist component</th>
<th>Climatic tourist component</th>
<th>Hydrographic tourist component</th>
<th>Biogeographic tourist component</th>
<th>TOTAL</th>
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<td></td>
<td></td>
<td>Relief units</td>
<td>Protected natural areas</td>
<td>Protected natural areas</td>
<td>Vegetation, fauna</td>
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<td></td>
<td></td>
<td>(m-mountains</td>
<td>(N-national J-county)</td>
<td>(N-national J-county)</td>
<td>(Si-steppe, PF-broadleaf, PA-mixed, R-coniferous, Su-subalpine)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>d-marginal)</td>
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</tr>
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<td>Călățele</td>
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<tr>
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<td>Cisnădie</td>
<td>4 (3m, 1d)</td>
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<tr>
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<td>Ciurila</td>
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<tr>
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<td>Feleacu</td>
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<td>11.</td>
<td>Măguri-Răcătău</td>
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<tr>
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### Table 3. Anthropic tourism patrimony and related attractive resources

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THE BARANYA GREENWAY AS THEMATIC TOURISM PRODUCT AND REGIONAL BRAND IN CROSS-BORDER COOPERATION

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Abstract. In the present study, the authors reveal and present an innovative (eco) rural tourism product brand of the South Transdanubian Region, Hungary from the point of view of product development and branding. Since tourism seeks for newer and newer alternatives for mass tourism, we believe that one of the tools for local development and local involvement can be the application of the innovative forms of ecotourism as mostly bottom-up initiatives. The study, based on our earlier research and publication results, provides an insight to the general tourism characteristics of the region and then, introduces the greenway movement together with a practice, the Baranya Greenway with a special attention to its branding procedure.

Keywords: branding, ecotourism, South Transdanubia, greenway, rural tourism, innovation
1. INTRODUCTION

One of the most recent products of thematic route development are the so called “greenways” which were launched in Hungary only in from 2011-2012. In our article we lay the emphasis on introducing this alternative form of tourism development, especially advantageous at the rural areas, by demonstrating a cross-border cooperation program on the Hungarian-Croatian border at the Baranya/Baranja area.

Since, parallel with the development and stages of our research and application of the greenway, we already published or will be publishing (accepted for publication) our former results in this topic, the present article focuses mainly on the importance of regional branding and reports our preliminary results in achieving and applying the methodology in connection with the so called Baranya Greenway.

Besides tourism development, the presented initiatives rely on forming a sustainable society and a healthy lifestyle as well where the major focus is on strengthening the co-operations between the different actors, the community development of the local population, strengthening of the non-motorised transport forms and heritage tourism of course at both sides of the border.

2. METHODOLOGY

The relevant data and sources of information were gathered by our research team from the first half of 2013 and finished in the second half of 2014. During this period of time first we carried out numerous field trips on the one hand to collect and create a thorough attraction survey (indicating all the relevant attractions of the region) and on the other hand to appoint the exact route of the greenway. This latter activity was greatly supported by GIS methods as well since the route consist mainly byways and dirt roads also strengthening the concept of sustainability. During the field trips we carried out interviews and deep interviews with the local population, the possible stakeholders and NGOs in order to receive exact and relevant information on the needs and demands of these actors. As for desk research we focused on the scientific elaboration of the collected data which will be discussed later in this paper.

3. RESULTS

3.1. Tourism in South Transdanubia

3.1.1. General introduction to the tourism of the South Transdanubian Region, Hungary

The South Transdanubian (planning statistical) Region is situated in the southwest part of Hungary constituting three counties, namely Somogy, Baranya and Tolna. The region possesses two tourism regions, namely the southern parts of Lake Balaton and the South Transdanubian Tourism Region.

The analysed region of South Transdanubia is a lagging or backward region since the change of the regime, especially from 2000, concerning both economy and demographic
aspects. It means that all the three counties of the NUTS II region are so-called internal peripheries, where the transport corridors are decisive in economic and social aspects alike.

If we consider the tourism demand we have to highlight that while the South Transdanubian (planning-statistical) Region together with the southern shores of Lake Balaton is one of the most favourable regions of Hungary, without the northern parts of Somogy county (Lake Balaton) the area shows rather decreasing statistics of little account. (Aubert et al., 2011, Szabó, G. and Csapó, J., 2012).

The tourism of the region is highly concentrated in space since the south shores of Lake Balaton account for some 57% of the total number of tourist arrivals, while the Pécs-Villány-Siklós region attracts another 28%. The second major destination of South Transdanubia is the Pécs-Mecsek and the Siklós-Villány micro-regions.

Based on 2012 data (Fig. 1.), the commercial accommodations of the South Transdanubian Tourism Region generate only 4.3% of Hungary’s guestflow and 3.9% of the country’s guest nights. Nearly 80% of the visitors are domestic tourists, while compared to Hungary’s domestic tourism it counts only 6.4% and from the international visitor flow only 2.9%. The most important sending destinations are Germany and Austria. The accentuated destination of the region such as Pécs or Harkány are unable to get into the first ten most visited cities of the country, Pécs was the 16th, Harkány was the 19th in 2012 (Magyar Turizmus Zrt 2013, CSO/KSH 2013).

Fig. 1. Tourist arrivals (A) and guest nights (N) in the tourism regions of Hungary (first data=absolute numbers in %; second data change in % compared to previous year)
(Source: Tourism in Hungary, 2013)
The volume of the guest flow show also a decrease which can be detected in the number of guest nights and the mean length of stay. The reasons for these unfavourable processes can be detected as follows:

- Small commercial accommodations supply from which mainly the high quality category hotels are missing,
- A great volume and significant losing of supply which were also negatively affected by the unfavourable international and national economic environment,
- The lack of health tourism destination with international or national importance and the cancelled modernisation of the existing spas (Csapó, J. and Jónás-Berki, M. 2011).

In the latter years the region built its tourism marketing strategy and supply on anthropocentricity, the landscape values, the quiet and peaceful countryside and health preservation so the highlighted tourism products are health tourism, cultural tourism, ecotourism, wine tourism, rural tourism and the different forms of active tourism.

### 3.2. Conceptual Paradigm and Methodology

#### 3.2.1. The Greenway Movement - Conceptual background

According to the Sopron Declaration, Environmental Partnership for Sustainable Development (2006) „Greenways are multifunctional trails, developed in both urban and rural areas, for non-motorized users typically leading along linear green corridors, historic trade routes, rivers and railways. They are managed by local people in order to encourage sustainable development and healthy lifestyle. Greenways provide a framework for community-based initiatives and projects related to nature conservation, cultural heritage preservation, sustainable tourism and mobility. Greenways seek to address needs of locals and visitors and to provide a positive contribution to the local economy.” (Sopron Declaration, Environmental Partnership for Sustainable Development, 1st July 2006).

We also agree with the concept of Lille Declaration, European Greenways Association (2000) according to which „Greenways are communication routes reserved exclusively for non-motorised journeys, developed in an integrated manner which enhances both the environment and quality of life of the surrounding area. These routes should meet satisfactory standards of width, gradient and surface condition to ensure that they are both user-friendly and low-risk for users of all abilities.” (Lille Declaration, European Greenways Association, 12th September 2000).

We would like to accentuate that the greenways are the most recent products of alternative tourism (quality, empathy, environment consciousness). This ecotourism product concept is an initiation for creating sustainable society and healthy lifestyle, for strengthening of international cooperation, for local community development, for strengthening sustainable transport forms and also strengthening heritage tourism.

Very important that this is a bottom-up initiative, a thematic route created by the local community for tourists who are interested in nature and culture (they also consider their protection as priority), and who prefer alternative forms of transport, such as hiking, cycling, equestrian very importantly on the bypasses and accommodation roads.
As for the settlements of the greenway it introduces the local attractions, monuments, customs and heritage, organises the events and festivals of their cultural heritage and offer local products for the tourist.

We determined three pillars for the greenways as it is shown in Fig 2.

---

**The attraction**
- It organises nature and the cultural memories of history to a linear route along the ancient transport connections

**The local (bottom-up) community**
- Carrying out the organisation and tourism management of the product

**Sustainability**
- Based on the local activities related to nature protection, heritage protection and sustainable tourism development, modelling the approach of the tourists as well

---

**Fig 2. The three pillars of the greenways**

(Ed. Szabó, G. and Csapó, J. 2014)

The three pillars of course rely on each other and so their complexity provides the basis for the holistic tourism development approach of the greenways.

---

### 3.2.2. Shortly on the brands in tourism

Before we try to determine the concept of tourism brands, first we have to take into consideration the definition of the brands in general.

Hoffmann, D. (2010) presents Armstrong, G. and Kotler, P. (2003) in connection with describing the market relevance of brands: “... branding has become so strong that today hardly nothing goes unbranded. ... Brand names help consumers identify products, ... tell ... something about product quality ...; ... brandname and trademark provide legal protection ...”
Also according to Armstrong, G. and Kotler, P. (2003) “A brand is a name, term, sign, symbol, or design, or a combination of these, that identifies the maker or seller of a product. ... Brands have higher brand equity to the extent that they have higher brand loyalty, name awareness, perceived quality, strong brand associations, and other assets such as patents, trademarks and channel relationships.” Kotler (1994) states the brands are “created to mark the material product or service and to make it differ from competitive offers”.

Competition is becoming more and more strong among the destinations both concerning the supplied tourism products and the applied marketing techniques as well. That is the main reason why in the – very much “oversupplied” – world market one would need a well recognisable, authentic, ethic and sustainable destination brand (Nemzetgazdasági Minisztérium, 2011).

Panasiuk, A. (2006) states that, the tourism brand can be understood either in a narrow and a broader sense as well:

- **narrow, where the brand is treated analogically to the brand used in other economic sectors (industry and service),**
- **broad, referring to the areas and tourism attractions, as a complex of actions pointed in a local (regional) tourism product.** (Panasiuk, A. 2006)

3.3. **The introduction to the IPA Cross-Border Greenway Development program (Croatia-Hungary)**

3.3.1. **The Baranya Greenway**

The successful tender of the Baranya Greenway was achieved in March, 2012 as part of the Croatia-Hungary IPA Cross-border Cooperation Programme 2007-2013, tendered by the Gyeregyalog.hu Association.

The project partners of the greenway are: Baranya Megyei Falusi Turizmus Közhasznú Szövetség (Village Tourism Public Utility Association of Baranya County), Bakonya Község Önkormányzata (Local Government of Bakonya), Horvátországi Magyar Vállalkozók Szövetsége (Association of Hungarian Entrepreneurs in Croatia), Hercegszőlős (Knezevi Vinogradi) Járás Önkormányzata (Local Government of Knezevi Vinogradi).

The territory of this initiative covered regions from Osijek to Western Mecsek (Bakony) (Fig. 3.) in the two countries of Hungary and Croatia. The major geographical areas of the greenway are the Western-Mecsek, the South-Baranya-hills, the Villány-Siklós Wine Route, the Bóly-Mohács Wine Route, the Danube-Drava National Park, the Baranya-Triangle – Kopácsi-meadow and the areas along the Drava.
All the 18 settlements on the Hungarian side (Bakonya, Kővágóóttós, Kővágószőlős, Cserkút, Pécs, Pogány, Egerág, Újpetre, Palkonya, Villánykövesd, Villány, Márok, Töttös, Nagynyárád, Majs, Sátorhely, Kőlked, Udvar) belong to Baranya county. The route itself has a northwest-southeast direction in Hungary and mainly a north-south direction in the Croatian side covering the settlements of Dvor, Batina, Zmajevac, Kneževi Vinogradi, Karanac, Kő, Lug, Vardarac, Kopačevo, Bilje and Osijek.

If we consider the attraction structure of the route, and the geographically related settlements, first we have to accentuate that we can distinguish between 3 types of settlements: regional centres (Pécs, Osijek), micro regional centres (Villány, Mohács, Beli Manastir) and small sized rural settlements. Of course they provide a different kind of attraction structure which serves as a basis for the differentiated tourism supply. (Table 1)
Table 1. The tourism product supply of the settlements along the Baranya Greenway

<table>
<thead>
<tr>
<th>Types of settlements along the route</th>
<th>Types of attractions (both Hungary and Croatia)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regional centres (most versatile)</td>
<td>• cultural tourism</td>
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<td></td>
<td>o heritage tourism</td>
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<td></td>
<td>o architecture</td>
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<td>o city tourism</td>
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<td></td>
<td>o events and festivals</td>
</tr>
<tr>
<td></td>
<td>o gastronomy</td>
</tr>
<tr>
<td>Micro regional centres (differentiated but on a smaller scale)</td>
<td>• cultural tourism</td>
</tr>
<tr>
<td></td>
<td>o heritage tourism</td>
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<tr>
<td></td>
<td>o architecture</td>
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<td>o gastronomy</td>
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<td></td>
<td>o wine regions</td>
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<td>o local food</td>
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<tr>
<td>Villages (usually concentrates on one or two tourism products)</td>
<td>• rural tourism</td>
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<td></td>
<td>o ecotourism</td>
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<td></td>
<td>o village tourism</td>
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<td>o agro tourism</td>
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<td>o fishing</td>
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<td>o water tourism</td>
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<td>o rowing, boating</td>
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<td>o gastronomy</td>
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<td>o wine regions</td>
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<td>o local food</td>
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</tbody>
</table>

(Source: ed. by Csapó, J. and Szabó, G. 2015)

After finishing several important steps in the creation process (scientific position analysis, the track of the greenway has been appointed, a webpage, introductory trips has been organised) we focused on the branding opportunities.

3.4. The branding process of the Baranya Greenway

We believe that the introduction of the branding process in this paper of the Baranya Greenway is useful both for the academic sphere and for the practice as well since this is first of all a new initiation and also because it strongly correlates with numerous regional development principles of the EU, in connection with regional brand creation and cross-border cooperation as well.

According to our ideas the branding process involved destination image, brand identity development, destination positioning and of course destination branding, a process used to develop a unique identity and personality that is different from all the competitive destinations and at last place branding development (Fig. 4.). Due to these processes the
A given place can and should become a marketable product and the settlement or the settlements will also appear as a brand.

For this we have to add associated and integrated products in the development agenda, and also have to analyse the „added values” and its elements such as the experiences of the potential consumer, the physical reality of the settlement, the culture and past of the settlement, the notions and image about the population of the settlement and the image of the settlement about itself (settlement identity).

Of course by achieving all this, the major aim is to demonstrate competence and uniqueness of the given region.

From the brand creation process we would like to demonstrate the creation of the logo variations of the Baranya Greenway since this is a very remarkable step in bringing into notoriety a region. Fig. 5. demonstrates the steps of the logo creation process (since figures can be published black and white, please concern that the colour of the figure is green).

Here one can see step by step the process of the logo creation (carried out by the authors) – one of the most important tools in order to market a region (the final version is on the right bottom). The logo itself represents with its colour (green) the closeness to nature, the hilly and also plain areas of the Baranya/Baranja region, and also emphasizes the alternative forms of transport with which one can travel around this thematic route.
As preliminary results we collected the already available major achievements of the project and the ones that are priorities but should be achieved in the near future in Fig 6.
4. CONCLUSIONS, FURTHER CHALLENGES

According to Fig. 4, in the branding/marketing process we already achieved such results concerning brand identity development and destination positioning as the creation of the common sign system (logo) or a joint webpage and organisation of trips and joint programmes.

A further, very important question is how could we activate the settlements along the greenway? In order to involve the local population/community we already started a bicycle lending program where the local service providers are tendering the altogether 70 bicycles of the host of the greenway and provide them to their visitors.

A further important step in the organisation to attract visitors is the stronger appearance in social marketing, social media and other type of communication with non-regular methods or for instance organising gastro-festivals with Facebook campaigns.

As a summary of our results we can state that all the mentioned factors organised to a network (with the more and more popular gastronomy festivals and cross border co-operations) provides a new trend of (rural tourism) development in the region which is very much needing it being a complex periphery of both related countries.
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CSO/KSH 2013 www.ksh.hu


OPTIONS FOR RESHAPING BOCŞA’S INTER-WAR TOURISTIC BRAND

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ABSTRACT Our approach aims to provide a historical and chronological outline on the evolution, over centuries, of the three communities that form the present Bocşa. Therefore, we focused on the spa status that Bocşa Montană acquired during ante and inter-war period. Thus, there are presented the most important leisure tourist sights which were used until mid-twentieth century, well-known local tourist routes, promenade area ‘Izvor’ set up by SteG and UDR, the network of local tourist units. Given the World Bank report on West Region (2011), West Region Development Strategy between 2014-2020 and the Development Strategy of BOCŞA (2014-2020) we assume that one of the most important axis of local and regional development in the next six years is tourism. Hence, in terms of tourism Bocşa aims to become the ‘gateway’ in the mountainous tourism. To sum up, in the final part of our study we stressed the need to regain the inter-war tourist brand by reopening the local tourist niches, such as ecumenical tourism (monastery and churches within the locality) industrial tourism (“iron” road, - Bocşa – Ocna de Fier), cultural tourism (“Constantin Lucaci” and “Constantin Gruescu” museum), leisure tourism (local pensions’ system). Our comparative study proposes an update and a recall of tourist traditions within Bocşa’s communities, a summary of prewar and interwar tourism and, in this way, a projective foundation of Bocşa’s development strategy, through the tourist offer in perspective of 2020s, recognizing that it is a reliable source to increase the quality of community life. The methodology of our approach presents a synthetic and interdisciplinary perspective - history and geography - focusing on tourism comparative method on two different historical periods, focusing on the synthesis on the invoice historical and geographical data in order to grasp the essential in Bocşa’s historic becoming.

Keywords: ante and inter-war period, development strategy, cultural tourism, leisure tourism, sights, gateway, ecumenical tourism

1.1. GEOGRAPHIC AND HISTORIC MILESTONES

To approach the evolutive dimensions related to the touristic geography of the town of Bocşa means to engage in a brief initial review of the most relevant local geographic
Options for reshaping Bocșa's inter-war touristic brand

characteristics and of the most relevant local geographic features, as well as the most representative events in the town’s historical development. From this esentialised excursion we may remark the diversity of the town habitat’s natural frame; surely the beginnings of its urban modernisation is due to the pre- and inter-war industrialisation, and the preoccupations for the support of the local tourism development.

- Situated in a hilly area, the town of Bocșa is 20 kms long and has a surface of around 675. 9 ha representing the locality’s intra muros zone, surface preponderantly occupied by dwellings built from the citizens’ funds, as well as three districts with block of flats;
- The town is located along the middle course of Bârzava river, in its meadow and along the valleys flowing into this river (the Gîrșilte, Valea Mare and Moravița creeks). The annual average debit calculated for the Bârzava river is of 3.89 m³;
- The locality lies 80 kms away from Timișoara and 18 kms away from Reșița, being situated north of parallel 45º, the geographic co-ordinates of this dwelling ranging between 21°45´ east latitude and 45°22´ north longitude;
- In general, Bocșa is surrounded by massifs and sub-Carpathian hills to the north and south. Among them, the most important is Mount Areniș, situated to the north, with the Areniș peak (551 m), and the south-western side, i.e. the Biniș-Doclîn area, is geographically represented by low hills (the most renowned height being Cracul de Aur / the Golden Leg); toward the west, the height lowers down into the Banat Plain;
- The annual average air temperature in Bocșa is +10.3º C, and the average annual quantities of precipitations range between 700-800 l/m²;
- The influence of the Mediterranean climate triggered the adaptation of certain species of the locality, such as: magnolias, figs, lemon trees, oleanders, cacti, and plane trees. The vegetation is diversified, and the hardwood forests are dominant (oak, linden and hornbeam trees).
- Until 1943 there were three “Bocșa” communes, i.e. Bocșa Montană (Mountainous Bocșa), Vasiova and Bocșa Română (Romanian Bocșa), and that year the first two communes united, forming Bocșa Vasiovei; as a result of the application of Law no. of 31 XII 1960, Bocșa Vasiovei was merged with Bocșa Română, forming today’s Bocșa.
- The Bocșa Depression is represented by traces of material civilisations dating from the Neolithic Era, as well as the Bronze and Iron Eeras (Colțan, the perimeter between Bocșa Română and Râma, Godinovei Valley etc.);
- The Roman continuity of the area may be illustrated by the exploitation of the gold ores at Cracul de Aur in the Moravița Mountains, proved by the discovery of a 119 silver coin deposit;
- At the beginning of the Middle Ages, Bocșa was part of the Cuiești district, with the administrative centre at the “Buza Turcului” Fortress;
- The first documentary attestation of Bocșa was in the year 1331, the locality being mentioned in a papal taxation document;
- The disappearance of the Cuiești district as form of Romanian administrative organisation took place at the end of the 14th century and the beginning of the 15th century. In the 16th century, the city changed its name, being mentioned as Bocșa since that moment;
- The first documentary attestation of Vasiova was recorded in the year 1437;
- Bocșa Română is documentarily attested for the first time in 1595;
Between 1552 and 1555, the city of Bocșa was under Ottoman ruling, being directly subordinated to the Timișoara “beglerbeg” (Turkish leader). After successive rulings of the city by the Turks, Austrians and Transylvanian Hungarians, in 1695 the fortress of Bocșa was definitively destroyed by the Austrians;

The year 1719 represents the year of the metallurgy beginnings in Bocșa (the first furnace for copper and iron ore melting at Neuwerk, erected by the foreman Friedrich Freiberg);

In 1722 – a tree-hammer forge is built at Bocșa Montană, and another two-hammer forge at Altwerk;

In 1725 the first iron ore melting furnace and the first forge are built at Bocșa Montană;

1737-1739 – the anti-Habsburg uprising in the Mountainous Banat also reached the Bocșa community. At that time one destroyed the metallurgic furnaces at Altwerk and Florianwerk, and the local Romanians allied with the Ottoman troops;

Between 1767-1770 – building of the first furnace at Bocșa Montană; 1780 – building of another two furnaces and two forges at Bocșa Montană;

In 1772 one sets the territorial and industrial exploitation borders separating Altwerk, Neuwerk and Florianwerk;

In 1780, Maria Teresa finalises the building works of a sanatorium for pulmonary illnesses, due to the curing properties of the air at Bocșa Montană;

1825 – creation of the Kohldorf colony and of the Măgura district;

1848-1849 – the revolutionary events found the Bocșa population allied with the Hussars of Major Ludovic Asboți against the border troops led by the Austrian general Appel. The revolution was defeated on the 25th of December 1848 at the Little Bridge and Vasiova barricade;

1855 – STEG takes over the Metallurgic Works at Bocșa;

1865 – opening of the works at the Eruga and the Bichiștin channels;

1865-1869 – building of two new modern furnaces at Bocșa Montană;

At 1870, STEG sets up a leisure area at Bründl (a restaurant, a Swiss-style shooting stand, the “Paradise” pool, and a pond for carp fishing);

The first railroad was the section opened between Voiteg and Vasiova – 6th of September 1874. The first section was opened in 1892 between Vasiova and Reșița.

1880 – the architect A. Diaconovici finalises the building works of the Savings Bank at Bocșa Montană;

1896 – closing of the Metallurgic Works of Bocșa, especially of the high furnace at Bocșa Montană;

1898 – finalisation of the works at the first hydro power plant at Bocșa Montană;

1898 – STEG builds the Farming Tools Factory at Bocșa Română, which will extend and diversify the production to become the most important economic agent for 100 years in the Bocșa area. Along time, it will bear several names more precisely: I.C.M.M.A., U.C.M.M.A., U.C.M.B., I.C.M.B., C.M.B.-SA;

1910 – street public electrification of two sections at Bocșa Montană and Vasiova.
● 1911 – opening of the Credit Bank and Post Office in the location of today’s Town Hall;
● On the 24th November, the Local Romanian National Council elected the delegates of the Bocșa Electoral Circle who represented Bocșa’s inhabitants at the 1st of December 1918 at the Alba-Iulia Assembly. On the occasion of the Great Union, the three Bocșa communities were represented by 19 full and suppleant delegates;
● 1927 – Michael Francisc Weber modernises the grinding technology at Bocșa Română by the installation of a Deutz engine of German manufacture;
● In 1931, by a decision of the Ministry of Labour, Health and Social Protection, Bocșa Montană is declared a climacteric resort and spa;
● 1935 – the workers at the Farming Machines Factory voluntarily erected the Workers’ House building at Bocșa Română;
● 1936 – Bocșa Montană becomes a district administrative centre, the headquarters of a Circuit Court and two deaneries (one Greek-Catholic and the other Orthodox);
● During the inter-war period, Bocșa Montană had a city-like aspect, with three restaurants (Lupu, Becker, Unirea), the “Cerbul de Aur” Hotel, several guesthouses, The Chamber of Credit and the Post Office.
● 1954 – the Bocșa Mining Enterprise is created;
● 1961 – one builds a station for washing and sorting ferrous and non-ferrous ores;
● 1968-1982 – the construction of the Nufărul dwelling complex (MFA)
● 1972 – I. C. M. B. is endowed with a modern Oxygen Factory;
● 1970-1982 – creation of the Agroindustrial Complex by building poultry farms and rabbit farms on the Biniș Road and in Groza Valley.
● If the inter-war period Bocșa was well represented in the banking system (Saving Bank, Chamber of Credit etc.), in the Communist period the banking system was reduced to only one CEC branch. At present, Bocșa is represented by the following banking institutions: the Transylvania Bank, BCR, BRD, Reiffeisen Bank, CEC Bank.

1.2. BOCȘA’S PRE- AND INTER- WAR TOURISTIC HORIZONS

The attempts to shape the contemporary Bocșa’s touristic offer, as well as its development prospects make us return to the recent historic past of this locality and briefly present its defining features of cure and climate resort, acquired by the mountainous local

community both in the Austrian-Hungarian period and in the first decades of the 20th century. Even since the beginning of the 19th century, Bocșa Germană (German Bocșa) had the outline of a spa-town or resort, the urbanism note being brought about by the local industrial development, the investments made in the area by the mountainous aerarium and praetorial administration in the locality: “Bocșa Germană hosts the headquarters of the circuit court bearing its name (until 1952, when it was closed, our note). It has a financial office, post and telegraph office, saving bank, choir society, union of voluntary firemen, casino, miners’ orchestra, hospital, social insurance. It is a small town with pleasant aspect, located on in a natural beauty scenery that makes it exceptionally attractive … Its houses are clean, two-storeyed downtown, the streets are regular and planted with rows of acacias”\textsuperscript{2}. Such appreciations were made in 1805. The elements of urban civilisation are even more accentuated at Bocșa Germană, so that in 1847 the locality had the aspect of an extremely clean town, with a sort of “pharmacy” scent. Here, the mining administration arranged a promenade and leisure area, called “Izvoraș” / Little Spring (Bründl), where in 1870 the StEG built a restaurant, and near it a Swiss-style shooting ground\textsuperscript{3}.

The elements of urban civilisation became more and more accentuated in the last decades of the 19th century. Thus, in 1880 one finalised the building works at the Savings Bank, building designed and executed by the engineer architect A. Diaconovici. In 1911 they finished the building works of the Credit Bank and Post Office, today’s Town Hall (patrimony asset), with the original façade inscription, and the building avant-garde was initially represented by a statue group symbolising the Hungarian revolutionaries fallen in the 1848 Revolution. In 1920 the monument was removed and replaced by the statue of the “Anonymous Soldier” (patrimony monument) executed by the sculptor Tiberiu Bottlik.

In 1936, Bocșa Montană had already become the district capital, the headquarters of a circuit court and two bishopries, one Orthodox and the other Greek-Catholic, being also an important economic and cultural centre. Due to its picturesque location on the banks of the Bârzava river, surrounded by sub-Carpathian hills covered in century-old hardwood forests, the commune was considered a resort or spa even since the period of the Austrian-Hungarian dualism (the first sanatorium for lung diseases treatment was built as back as during Empress Maria Teresa’s reign, more precisely in 1780; on the old location the Welicsek Compound was erected in the inter-war period).

Due to the air healing properties, grace to the existence in the area of a hardwood forest area and remarkable touristic tracks, modernisations executed by StEG and UDR at a leisure compound in the Izvoraș area, the functional hotel and restaurant in the locality, the Welicsek Sanatorium, Bocșa Montană was declared a climate spa resort by a decision of the Ministry of Labour, Health and Social Protection, no. 46.713 of 25\textsuperscript{th} of July 1931. In this respect, we should remind the inter-war “perfume” of the “Paradise” restaurant and pool, with a modern architecture for those times, comprising a terrace, a tennis court, a bowling alley, rose garden and carp fishery. The promenade place was in the same zone, with plane and linden tree alleys, a beach setup by de U.D.R.. A little higher there was the “Maere”plateau, surrounded by a forest rich in oak, beech, linden and hornbeam trees. At around 3-4 kms from “Bocșa-Izvor / Spring” one reached the place called “Vârtoape”, owned by U.D.R., with two lakes for carp breeding, after taking the road through valleys.

\textsuperscript{2} Haupt, H., 1999, p. 75

\textsuperscript{3} Breudel, G., Temeswárer Zeitung, 1870, p. 4.
and hills covered in hardwood forests producing a “strong” air, beneficial for lung illnesses. Other touristic itineraries of the period could be organised towards the “Medreșului Valley”, “Calvary Chapel”, “Smida”, “Măgura” and especially “Buza Turcului”, where we can still see the vestiges of the old Bocşa citadel.4

In the locality, touristic services were relatively well represented, as there were, operating at full capacity, a hotel (“Cerbul de Aur / Golden Deer”), three restaurants („Becker”, „Cucu”, „Unirea”), as well as numerous private guesthouses at the disposal of visitors. As we have already mentioned, there was, at Bocşa Montană, a recreation and healthcare compound, “Dr. Welicsek Sanatorium”, with modern installations, setup for hydrotherapy and altitude air cure, after the model of Dr. Lahmann Sanatorium in Dresden. The Bocşa Resort benefited from a prompt information service, called the “Local Office for Cure and Tourism”.5

1.3. BOCŞA'S PRESENT TOURISTIC OFFER – PROSPECTS OF EVOLUTION

The successive waves of colonisations ordered by the Vienna Chancery and then by Hungarian landowners determined the cohabitation of Orthodox cult institutions with the Reformed, Roman-Catholic, Greek-Catholic and Mosaic churches in Bocşa’s localities. The Bocşa communes, in their industrial development, were affected by three waves of colonists: 1718-1780, 1801-1850 (during these two stages most colonists came from Styria), and the third stage, predominantly Hungarian, took place between the last decades of the 19th century and the first decade of the 20th century. The autochthonous Romanians’ cohabitation with these ethnic groups generated, among others, the erection of places of worship which, at present, are listed among the touristic sights, being declared patrimony assets.

We shall continue by enumerating, in a chronological sequence, the erection of local religious monuments: 1726 – end of building works at the Bocşa Montană Roman-Catholic Church in its first form. The present sanctuary was built in 1756 – and is a patrimony historical asset; in 1773 the Roman-Catholic priest Ioseph Ermann erected the Calvary Chapel, on a slope in the eastern part of Bocşa Montana, significantly affected by the 1848 Revolution, today it is a historical monument; 1751 – the construction of the first Orthodox church at Bocșa Română. The parish has 680 church-goers – and it is also a patrimony historical monument; in 1783 they finalised the construction works of the Roman-Catholic Church at Neuwerk dedicated to Saint Nepomuk – a patrimony historical monument; 1798 – end of the building works at the Bocșa Montană Orthodox Church. Today’s congregation has 848 active members– this is also a historical patrimony monument; 1803 – they finished the construction of the Vasiova Orthodox Church, with 994 church-goers at the moment – a patrimony historical monument; 1843 – inauguration of the Greek-Catholic Church at Bocșa Montană – also a patrimony historical monument; the Monastery St. Ilie Tesviteanul (St. Elijah of Tesvitea) was built between 1905-1907 – and is today a patrimony historical monument; the Roman Bocșa Română -Catholic Church was built between 1920-1928 – a patrimony historical monument in its turn; the Reformed Church at Bocșa Montană, a

4 Grădinariu, E., Udrea-Stoia I., 1936, op. cit, p. 64-69.
5 Ibidem, p. 42; Kakerda, F., in Francea, III, no. 24, from 4th july 1936; Pâșărică I., 1936, p. 79-82.
Reşiţa subsidiary, was built between 1937-1938 – and is today a patrimony historical monument.

The Severinul newspaper informed the readers on the 31st of May 1908 that a limestone factory was being built at Colţan which was to use the electrical energy for the internal lighting and in the limestone burning technology. In 1910, the same newspaper announced that the Praeture of Bocşa Montană and the mayor’s office of the three Bocşa communes decided to conclude a contract of electric power assignment, after the mounting of street public lighting on the main axes of these localities. The Eruga channel served the metallurgic works at Bocşa Montană, especially the furnaces, by producing mechanical energy in the period 1865-1898, when the Francis turbine of the hydroelectric power plant in the locality was put into operation. The three Bocşa Town Halls each concluded a contract with a firm of Kikinda Mare for the setup of a street electrical network for household and public lighting. The contract was signed on the 8th of May 1910 for a 50-year period. Following the execution of works by the co-owners Arthur Revesz and Carol Molnar, Bocşa Montană became the second rural commune in the Romanian area to benefit from street public lighting. The hydroelectric power plant in the proximity of Bocşa Montană Station, together with the Eruga channel, may be considered touristic monuments of national and universal interest. The same category may be completed by the loading tower, built in 1868, at that time the newest special technology construction in the Austrian-Hungarian Empire. Since 2013, the Bocşa Town Hall has proceeded to the elaboration of a feasibility survey related to the opening of declogging works of the Eruga channel, reopening of hydroelectric power plant downstream the location of the former plant, transformation of the old hydroelectric installation into a museum destined to cultural events; the same endeavours are made in relation with the loading tower in the premises of the former metallurgic works at Bocşa Montană.

Somewhere near Bocşa Română’s west extremity, close to the Bârzava river, on a surface plane like a plateau, we would encounter, at the end of the 19th century, a small mill owned by the Weber family. They were enterprising Jews, speaking German and Hungarian, with a sense for business and erection of buildings and premises able to resist time. The last descendant, Michael Weber, also with the entrepreneurship vocation, was in charge with the mill management until 1948, when it was nationalised. In 1927, on the frame of the old mill he built another one, modern for his times, giving up the grinding technology with stones driven by the force of the water flowing down a channel detached from the Bârzava river. In the first stage, he rearranged the channel, widened and deepened it and cemented its banks so that the water debit could be appreciable. He installed, for this purpose, a shaft mill driven by a huge engine, fed by gas oil, imported from Hungary, engine manufactured by the famous German company Deutz. The installation of this motor and the putting into operation of the new grinding installation was done on the 8th of June 1927, reason why that day was annually commemorated by the Webers by a rustic celebration. The flour obtained here was of high quality, the miller acquiring a true blazon in time, and thus in the mill premises one could see, in the inter-war period, a lot of cereal sacks brought in from Berzovia or Comorâşte, from Reşiţa or Caraşova etc. At present, this touristic sight is in a

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9 Jurma Gh., Petrica V., op. cit, pp. 112-181.
9 Vişan, M., Crecan, D., op. cit., p. 145-146.
deplorable state of degradation, caused by the successive thefts of materials from the building strength structure beginning with 1997.

Another historical monument representative for the town of Bocșa is the Cuiești citadel, whose beginnings may be found in the early feudalism, fortress that proves the documentary first record of today’s town. The Cuiești fortress, an important medieval royal defensive city in southern Banat, is located in the northern section of the town, to the right of the present Vasiova district, fortress erected on a 125 m height over the Bârzava river. Situated on a promontory of the ”Buza Turcului” hill, the Cuiești city was the headquarters of a polygonal plan castle of a Romanian noble family. However the proper beginning of the construction still remain unknown. It is absolutely certain that this citadel, like others with defensive role in the proximity of the Bârzava river, were erected in the period of the Roman rule, being later on rebuilt by the autochthonous Romanians to serve as headquarters for the local rulers. The Cuiești royal citadel has the administrative and political headquarters of the district, being built according to a plan adapted to the terrain on which it was located. Thus, the walls of the city had the shape of an irregular polygonal, with interior diameters measured on the main axes of 29 and 32 meters. Behind the northern side, the polygonal was endowed with a square-plane interior tower, with 4.30-4.50 m interior dimensions, with the role of gate tower. The inner wall was better kept on the northern side, the rest being destroyed almost in totality. The 1.70 m thickness of the inner wall was thicker to the corners, where it reached 3 m. To the north east, in the vicinity of the gate tower, there was a second interior tower, of which we can see now only part of the two-level access stairs, tower which had the role of a dungeon. In the north-east corner we find now a 5/4 hole, resulted from the fortress destruction in 1595. Located on a promontory, the north and north-east sides were fortified by a defence ditch, 15-20 m wide and around 4 m deep. In the middle of the defence ditch one can still see a building pillar which used to support the access bridge to the city. All these specific elements at Buza Turcului confer it the typological and structural characteristics of the walling fortifications dating from the 13th – 14th century.

Among the touristic service-providing facilities, the post-December Bocșa, grace to its attractive natural scenery, are well represented by a series of older economic agents, but modernised to the EU standards, and by another series of hotel facilities erected in the last period. The facilities for tourists in the Bocșa area are: the “Stejarul” guesthouse, “Alyin” guesthouse, “Izvor” motel, the “Nufărul” and the “Insomnia” guesthouse.

The “Alyin” guesthouse, the most recent construction with touristic specificity in the locality, is located at 10, Dacia street, in the vicinity of the Reșița-Timișoara national road. Situated in a villa district, in former Bichiștin, having the low end of Dogneceua Mountains in the background, the 3-star guesthouse provides accommodation and meals to tourists or locals, and can host conference and cultural or business symposiums. The construction started in August 2007, and the official opening was in May 2011. The guesthouse, a svelte construction erected on a total surface of 960 m², has a restaurant with 80-100 places, a conference hall with around 50-60 places, 12 accommodation rooms (a mini apartment, two
matrimonial double rooms and two double rooms, all with TV, fax, Internet etc.) and a terrace with 50-60 places.

The “Izvor” motel on the same street is located in the proximity of the Bârzava river dam, in a hilly area where the hardwood and softwood forests perfectly coexist, and here the agreeable sub-Mediterranean climate favours the development of a rich fauna and flora. The building was erected in 1973 and was in the property of Federal Coop. Reduced to an advanced stage of physical deterioration, it was purchased by the Szilagyi family, and since then the building has undergone successive investments and renovations in the past 20 years, and thus the 2-star motel-guest house offers now excellent conditions for leisure spending and recreation to foreign and Romanian tourists. The touristic compound comprises: a restaurant with the capacity of 90 places, a wing with accommodation rooms, where on the ground floor we find 3 double rooms and two apartment, and the attic has triple rooms and a room with four beds, all with cable TV, TV set, Internet etc. The entire building is heated in cold season by a thermal central with pellets. Moreover, the guesthouse also has a dance floor terrace and a multifunctional sports ground. One can organise here events such as coming of age, birthday parties, wedding and baptism receptions, school banquets etc. In general, the tourists are locals, employees of firms from the locality, but also Serbians, Dutch and Austrians. The location of this touristic facility offers the possibility of taking hikes toward Lake Vârtoape and the Colțan Neolithic site.

The “Nufărul” guesthouse is located at the foot of the peri-mountainous hills Medreșul Mare (372 m), on a creek like a narrow depression, in the vicinity of Lake Medreș. It is a modern and elegant construction open to local and international tourism. Its owner, Emanuel Dănilă, succeeded in earning a good name in the sector of services providing with this 3-star guesthouse located in a space he owned, in surface of 8,000 m². Officially, the guesthouse was opened at the end of 2007 under the form of a touristic compound made of a central wing, a terrace with numerous promenade ways in the entire facility, an inner pool, a lake with lilies for leisure and fishing. The central wing has a restaurant with 80-90 places, where, beside festivities, banquets, wedding and baptism receptions etc, one can organise conferences and symposiums by rearranging the modules of the hall perimeter. In the central wing, on the first floor, there are five rooms, four double rooms and one triple room, all equipped with cable TV and Internet. The terrace, grace to the panorama it overviews, offers real modalities of recreation and meditation, and has a capacity of around 100 places.

On a slope near Lake Medreș, in the northern area of the Bocșa Montană district, we can stop at “Stejarul / The Oak” guesthouse, a modern and air-lined construction offering the entire panorama over the Bârzava meadows and the whole neighbourhood. The old building, previously owned by UJCOOP Caraș-Severin, was purchased by the brothers Dorel-Petrică and Florentin Bocșan in 1994 by public auction at the price of 17 million lei. At present, the guesthouse was included into the touristic circuit, being assessed as a 3-star facility following some successive works of modernisation and extensions of the former building erected in the Communist era. Today, the guesthouse provides accommodation and recreation services, hosts different local or regional events (banquets, wedding and baptism receptions, anniversaries, conferences, symposiums etc), and proposes hiking to the hilly area in the surroundings of historic Bocșa. The financial efforts of this guesthouse shareholders by far exceed ten billion lei, investments especially in the extension of the accommodation spaces, restaurant, modern kitchen equipment, terrace and mini-pool setup. The guesthouse has 12 double rooms, three single rooms and two complete apartments, being heated with methane gas in the cold season; it has cable TV and Internet facilities.
The restaurant can hold 100 people, with the possibility of seating guests on the exterior terrace, from where they have a bird’s eye view over the entire neighbourhood panorama.

SC “Insomnia” SRL has functioned as a guesthouse even since May 2005, being classified as a 3-star leisure facility. The administrative offices and accommodation areas of this guesthouse are located in the former administrative headquarters of Avicola Bocșa, as the building was purchased from the Mayor’s Office of the Berzovia commune. A lot of modernisation works were executed here in the summer of 2005. The guesthouse offers accommodation to the tourists visiting the area and especially for the labour force employed by local economic agents. Beside the seven rooms (15 places, two triple rooms, four double rooms and a single room, all with bathroom, telephone, TV, cable, fridge), the guesthouse has a bar-restaurant organising diverse events for 75 persons. The preoccupation of the shareholder for providing excellent touristic services aims at increasing the comfort and quality of services, a predictable goal for 2012 grace to the implementation of a European project. It was finalised by realising a catering service with a capacity of 400 places, by installing a heated tent, with lighting, air conditioned, parquet floor and kitchen equipment with last-generation devices. What is new for this type of services in the local and regional context resides in the fact that the new “construction” is mobile, it can be hired for satisfying the requirements of customers for special important events in their lives: wedding and baptism ceremonies, birthday parties, banquets etc.

The year 2010 was the start year for the Programme “Europe 2020” as new strategy of economic growth along three major directions: “smart growth”, “sustainable growth” and “inclusive growth”. The regional development in Romania has as logistic and financial support a Report of the World Bank elaborated between 2011-2013. This document underlined the adoption of the Development Strategy of the West Region. Among the regional policies with impact in the West Region economy we may list the component of the smart policies focused on tourism, more precisely urban and MICE tourism, ecotourism and active tourism, spa and wellbeing tourism. The development strategy for the town of Bocșa (2014-2020) comprises six general directions of local development, concretised in 46 objectives, and the latter are materialised in annual and multi-annual action plans. The purpose of this local development document is to match the local development co-ordinates with the regional and county plans and to find the right way for a sustainable development, with a local imprint.

The sixth direction written down in the Bocșa strategy, called “Transformation of the town of Bocșa into a touristic entry gate to the Mountainous Banat” aims at bringing forth some touristic zonal opportunities by the reiteration of the historical status of resort locality, cure and recreation spa, which it was until the middle of the 20th century, the highlighting of all patrimony monuments, especially the Cuiesti fortress, the reassessment of the “iron way” and the beginning of metallurgy, the emphasis on the exceptional qualities of the ecosystem and local touristic tracks. In this case, such a direction is envisaged for the next six years in a series of specific objectives such as: “a. creation of a cultural centre comprising a mineralogy and iron aesthetics museum, a museum of contemporary sculpture, an ethnographic museum, a dendrology park; b. establishment of an information and documentation tourists’ point for the Bocșa and Mountainous Banat area; c. conservation, refurbishment and highlighting of the town patrimony, especially of the cultural and historical assets (putting into operation and conservation, in a museum form, of the former power plant, the Eruga channel, the loading tower and the Calvary Chapel); d. elaboration of an area touristic map, and repair of the old touristic tracks in the urban and peri-
The edification of a Cultural Compound in the present facility of the Bocșa Culture Home, objective to be finalised in 2015, which will host a local and county info-tourism centres, two universal circulation museums (the “Constantin Lucaci” and the “Constantin Gruescu” museums, a park in the interior of this complex called the “Welicsek” Park, to comprise the fossil exhibits of Quaternary swamp cypress. The local info-tourism centre will revive the inter-war touristic itineraries, as follows: 1. Culture Home – Calvary Chapel – Chapel and sculptures in the Bocșa Montană Catholic cemetery – Hydro Power Plant and furnace in the perimeter of the Bocșa Montană railroad station - Lake Medreș - Eruga channel – Lake Virtoape; 2. Culture Home – churches of the local patrimony – Cuiești fortress – Monastery “St. Elijah of Tesvitea “ – Ocna de Fier Mineralogy museum – Dognecea lily lakes.

The comparative approach of two local travel - tourism offers - a prewar and interwar travel offer and the idea of tourist offer made by the current government from Bocșa - highlights the need to revive local tourism and resort spas, all around Bocșa’s area, considering it as the only source of economic recovery of the local community. In this sense, we can draw some conclusions on this investigation:

- even if for almost three centuries iron metallurgy and metal constructions were ferment overall economic development of the locality, the chance of contemporary economic revival of the city lies in the tertiary sector, namely regenerated services and tourism, one that should mean „ gate tourism „ input from Timisoara into Mountainious Banat;
- revaluation of touristic traditions through a revival of the old trails and through a revival of tourism niche - revitalizing of Welicsek spa hospitalization, all through a consistent European funding and the support from the local budget;
- economic revival of the city from the middle Bârzava and improving the quality of community life can be achieved in the medium term, until the end of 2020, implying a range of tourist specialized services units that would cover the need for cultural, industrial, ecumenical and gourmet tourism due to the local diversity.

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Options for reshaping Bocșa’s inter-war touristic brand

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UNEMPLOYMENT AS MAJOR ISSUE IN VOJVODINA PROVINCE: A CASE STUDY OF KIKINDA MUNICIPALITY

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Abstract: Kikinda municipality borders Romania and is the most Eastern, peripheral part of Vojvodina. High unemployment rate and few job possibilities are just some of the problems which led to depopulation of the area. High unemployment rate influences the reduction of production, the decrease in human resources, the increase in the crime rate and social instability. Demographic stabilisation would be achieved if migration was stopped and some alternative economy developed in order to reduce the unemployment. Unemployment rate could be reduced with a long term plan and its gradual realisation. The results of the research conducted in the period between January 2007 and December 2010 show that the number of unemployed people was reduced in Kikinda municipality. The majority of the unemployed were the people from the age group of 30 – 34, with the lower level of education.

Key words: Kikinda municipality, unemployment, depopulation, North Banat

1. INTRODUCTION

Kikinda municipality is the municipality in the northern part of Banat. Kikinda municipality borders Romania and is the most Eastern, peripheral part of Vojvodina.

The number of population living in Banat has often changed because this area has had periods of demographic and economic prosperity interchanged with periods of recession and depopulation (Kicošev, 1998). Major demographic changes have been caused by either haphazard or organized migrations, changes in the countries and country borders, different economic changes, industrialization, urbanization and by other elements (Ivkov-Džigurski et al., 2010). Some demographic factors have had a positive effect and some have
had a negative effect to the population size of Banat. The changes in the population number of Kikinda municipality observed in the last four censuses record a declining trend. General characteristics of the municipality are extremely unfavourable. It is characterized by depopulation, which is the result of low population growth, unfavourable age structure of the population, emigration processes and high unemployment rate (Vuksanović et al., 2004). The county is not attractive and appealing for migrating from other areas, and younger population does not show any desire to stay in the area. The most common reasons for this situation can be found in the lack of perspective for a better standard of living, a better quality of life and better and more secure future. High unemployment and small possibilities for new job openings are just some of a series of problems which cause depopulation. Insufficient competitiveness on the market and small possibilities for export are also significant reasons for high unemployment rate in the area of Banat (Pantelić et al., 2011).

Employment, as a factor of economic development and as an indicator of the achieved level of economic development, presents one of the constant and priority development aims (Miljuš, 1975). High percentage of unemployment should cause major concern, because it causes a disturbance of economic welfare, a decrease in industrial production, a decrease in human resources, and an increase in crime and social instability (Kingdon, Knight, 2004). Also, low employment and economic activity are the main causes of lack of competitiveness of the area (Vuković, 2009). Not only is the issue of unemployment a local problem, but it is also the problem of a country. Unemployment is a problem found in many countries in the last ten years, and this is why this problem should be solved by a society as a whole (Gomes, Gomes da Silva, 2009). Society and the country are applying a list of different measures to alleviate this problem. Each applied measure can have its benefits and drawbacks, and has its constraints, such as financial, political, civil ones. A long time span which exists between the applied measures and expected results additionally burdens the fight against depopulation. The carriers of these measures are politicians whose term in office is usually shorter than the time needed for a measure to bring results. This is why they avoid investing large financial resources which could be justified only in 20-25 years (Đurđev, 2006). The evidence, confirming that unemployment is a big global problem, is a research conducted in 73 countries in the world from 2000 to 2003, which shows in the augmentation of the number of unemployed persons with a tendency of increase in the number of unemployed women (Feldmann, 2009). The examples of South African countries show that their population is exposed to poverty and big social problems because of the large number of unemployed persons (Kingdon, Knight, 2006). The research studies conducted in the U.S.A. (Mukoyama, Şahin, 2009) and in Holland (Dur, 2001) show that the length of periods of unemployment has been increasingly longer for the last thirty years.

Long-term unemployment can have very negative consequences that influence worker abilities. Furthermore, due to long-term unemployment, there are many consequences which have an impact on the mental and physical health of an individual (Ezzy, 1993). The results of numerous studies in the world show that long-term unemployment can even cause health disorders, and that employed persons have less psychological dysfunctions than unemployed persons (Graetz, 1993, Kivimaki et al., 2003). Studies also show that unemployed female population experiences psychological disorders to a greater extent (Hammarström, 1996). Psychological anxiety is a very serious problem
for unemployed youth, which can cause various social and psychological dysfunctions. Unemployed persons are prone to stress, fall into a state of depression and easily commit to consuming cigarettes, alcohol and other forbidden substances (Bjarnason, Sigurdardottir, 2003). Some studies show that long-term unemployment in the early stages of a career has a major impact on later employment (Burgess et al., 2003).

As is the case in the world, unemployment is very pronounced in Serbia, either. How serious this problem is, best show the unemployment rate, which are increasing from year to year. The unemployment rate in Serbia in 2009. was 16.6 ‰, in 2010. was 19.2 ‰ and in 2011. was 23.7 ‰. Data above indicated that unemployment rate in Serbia is far away from European average which is 10.4 ‰.

Based on the results of this research, certain guidelines can be determined, which would have an impact on decreasing unemployment in this area. Furthermore, it can also be determined which age groups and educational groups are at risk and which ones should be given special attention when creating and implementing special regional programmes.

2. THE POSITION OF THE STUDIED AREA AND RESEARCH METHODOLOGY

Kikinda municipality is the largest municipality in the northern part of Banat and covers an area of 782 km². The municipality borders Romania and covers about 7.9% of Banat territory, i.e. 3.6% of Vojvodina territory (Statistical Office of the Republic of Serbia, 2004a). Kikinda municipality is situated in the furthest eastern, peripheral part of Vojvodina, which became even more peripheral with Romania joining the EU (Ivkov et al, 2010).

At the 2002 census, Kikinda municipality had 67,002 inhabitants (32,675 males and 34,327 females). It had 10,363 inhabitants in the age structure above 15, 46,044 persons in working age population (from 15 to 65), 10,312 inhabitants over 65. Unknown was 283 persons. In working age structure is dominant persons between 45 and 49 (12.3%), as the smallest number of people in group between 55-59 (7.5%) (Statistical Office of the Republic of Serbia, 2011).

Observation and analysis of the number of employed persons in Kikinda municipality was conducted within a four year period. The research analyzes the period from January 2007 to December 2010. Actively employed and working-age population participated in the research. The data were taken from the National Employment Office, then they were summated and statistically analyzed. In the period 2007 and 2008, a research study was conducted and comprised nine border municipalities of Banat, whereas in 2009, the research comprised three municipalities of Northern Banat, so the results of this research will be compared with the mentioned research studies.
Basic methods used for the collection and processing of data and the analysis of results are: historical method (written documents, statistical data, investigating results of similar topic), statistical processing of the investigated literature and other resources, quantitative and qualitative analysis of the content, comparative method.

3. ANALYSIS AND DISCUSSION OF RESULTS

According to the results of the 2002 census, the highest percentage of the population in Vojvodina is involved in the processing industries (26.1%, in towns 29.3%), followed by agriculture (22.6%, in towns 8.3%), and in the third place by trade and servicing motor vehicles, motor bicycles, and home utensils (12.9%, in towns 15.9%).

Structure of employed persons in Kikinda municipality according to the 2002 census. Kikinda municipality is dominated by the population employed in processing industry (33.5%), whereas the percentage is even higher (37.4%) in the town of Kikinda. Persons involved in agriculture (18.1%) are in the second place in the municipality, whereas in the town, this place is taken by trade and servicing motor vehicles, motor bicycles and home utensils (12.8%). Trade with complementary activities (10.9%) is the third in the
municipality, whereas in the town, it is agriculture (7.9%), (Statistical Office of the Republic of Serbia, 2004b). The highest percent of population in Vojvodina is engaged in the processing industry, while in Banat is dominant population which is engaged in agriculture. Results shows slightly difference with regard to other border municipalities of Banat, because the dominant population in Kikinda is engaged in processing industry, not in agriculture. Higher percentage of employment in manufacturing industry is also present in Vršac municipality (Pašić et al., 2010), and accordingly, we can conclude that bigger municipalities, such as Kikinda and Vršac have a more developed manufacturing industry.

Structure of unemployed persons in Kikinda municipality by age and gender. According to Employment and Insurance against Unemployment Act (Official Gazette of the Republic of Serbia, No. 71/03), an unemployed person is each person aged between 15 and 65, able and ready to work, who did not get employment or the right to work in any other way, and is officially registered as unemployed and actively seeks employment (National Employment Office Kikinda, 2010).

By December 31, 2010 in Kikinda municipality were 42,554 working-age persons, of which 6,086 were unemployed. The unemployment rate was 14.3 ‰. The difference between the real and recorded number is created because persons are removed from the registry of the Office for several reasons:

1. If they do not report regularly to the National Employment Office;
2. If they do not respond to a call by National Employment Office;
3. If they do not report to the employer who they were sent to for an interview;
4. If they refuse a job without justified reasons;
5. If they are persons who are involved in a job which is not completely legal or they are not legally registered as employees (National Employment Office Kikinda, 2010).

For the demographic development of an area, it is important to establish the age structure of the population, which not only shows previous development and current situation, but it can also be used for projections of future population movement (Mijanović, 2008).

If data on unemployed persons is analyzed by gender and age (Table 1), it can be observed that the total number of unemployed persons comprises 47.5% of men and 52.5% of women. If this data is compared to the municipalities which are also situated in Northern Banat (Čoka and Novi Kneževac), we can observe that Kikinda municipality has a slightly higher percentage of unemployed female population, whereas Novi Kneževac and Čoka municipalities are dominated by unemployed male population (Pantelić et al., 2011). In the group of municipalities along the border area of Banat, Vršac municipality stands out with a slightly higher percentage of unemployed women when compared to men (Ivkov et al., 2010). Based on these data, we can conclude that in bigger municipalities, such as Kikinda and Vršac, there are more possibilities for employment of female population.

As regards age structure, the majority of population is in the age groups of 30-34 (12.8%), 50-54 (12.8%) and 35-39 (12.7%). This is not encouraging, because it is known that it is less likely for the employers to hire older population, and over 70% of unemployed persons in Kikinda municipality are older than 30.

When analysing separately men and women, it can be observed that the highest proportion of unemployed men are aged 50-54 (12.9%) and 20-24 (11.8%). The data show a significant difference when compared to the surrounding municipalities (Novi Kneževac
and Čoka), since the mentioned municipalities are dominated by people aged 45-49 (Pantelić et al., 2011).

As far as women are concerned, the largest percentage of unemployed women are aged 30-34 (14.1%) and 25-29 (13.8%). People over 60 (2.6%), as well as those younger than 19 (3.8%) have the smallest proportion in the total number of unemployed persons.

Table 1. Unemployed persons by gender and age.

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>%</th>
<th>Male</th>
<th>%</th>
<th>Female</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>6,086</td>
<td>100</td>
<td>2,890</td>
<td>100</td>
<td>3,196</td>
<td>100</td>
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<tr>
<td>15-19 year</td>
<td>229</td>
<td>3.8</td>
<td>136</td>
<td>4.7</td>
<td>93</td>
<td>2.9</td>
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<tr>
<td>20-24</td>
<td>687</td>
<td>11.3</td>
<td>341</td>
<td>11.8</td>
<td>346</td>
<td>10.8</td>
</tr>
<tr>
<td>25-29</td>
<td>763</td>
<td>12.5</td>
<td>322</td>
<td>11.1</td>
<td>441</td>
<td>13.8</td>
</tr>
<tr>
<td>30-34</td>
<td>782</td>
<td>12.8</td>
<td>332</td>
<td>11.5</td>
<td>450</td>
<td>14.1</td>
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<tr>
<td>35-39</td>
<td>771</td>
<td>12.7</td>
<td>336</td>
<td>11.6</td>
<td>435</td>
<td>13.6</td>
</tr>
<tr>
<td>40-44</td>
<td>706</td>
<td>11.6</td>
<td>306</td>
<td>10.6</td>
<td>400</td>
<td>12.5</td>
</tr>
<tr>
<td>45-49</td>
<td>694</td>
<td>11.4</td>
<td>301</td>
<td>10.4</td>
<td>393</td>
<td>12.3</td>
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<td>12.8</td>
<td>374</td>
<td>12.9</td>
<td>403</td>
<td>12.6</td>
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<tr>
<td>55-59</td>
<td>517</td>
<td>8.5</td>
<td>297</td>
<td>10.3</td>
<td>220</td>
<td>6.9</td>
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<tr>
<td>60-64</td>
<td>160</td>
<td>2.6</td>
<td>145</td>
<td>5.0</td>
<td>15</td>
<td>0.5</td>
</tr>
</tbody>
</table>


Structure of unemployed persons in Kikinda municipality by gender and level of educational attainment. The data from December 31, 2010 for Kikinda municipality show that the largest percentage of unemployed persons have level I of educational attainment (35.2%), followed by level III (25.7%) and level IV (24.5%).

The situation cannot be characterized as being favourable, because it can be observed that 41% of unemployed persons are unqualified (level I and II of educational attainment), and about 50% of persons have lower level of educational attainment (level III and IV).

The proportion of unemployed persons with higher level of educational attainment from V to VIII is also significant (Ivkov et al., 2010). When compared to other border municipalities of Banat, Kikinda municipality stands out with the largest percentage of unemployed persons with high level of education (8.3%). In addition to Kikinda municipality, there has been a significant percentage of unemployed persons with high level of educational attainment in Vršac municipality in the last few years, (Ivkov et al., 2010), and accordingly we can conclude that in bigger municipalities, highly educated persons have more difficulties to find employment. In the municipalities with over 30,000 people, demand for workforce is higher, there are more job positions, but the competitiveness among young highly educated people is up to ten times higher than in smaller settlements.

If data by gender are compared, it can be observed that unemployed men with level I of educational attainment (35.3%) have the largest share, followed by women with the same level of educational attainment (35.2%). The next category by size comprises men with level III (32.1%), followed by women with level IV (29.6%). When compared to

1 Level I – elementary school; level IV – four grades of secondary school; level VI – completed higher school; level VII – university graduates (faculty); level VIII – PhD degree
municipalities in the vicinity (Pantelić et al., 2011), we cannot observe any significant difference, because they are dominated by the same categories of unemployed population.

Based on the presented data, we can state that the percentage of unemployed persons with level I of educational attainment in Kikinda municipality decreased in 2010, from 42.3%, which was by the end of 2009, (Pantelić et al., 2011) to 35.2%. What is very unfavourable is the fact that the proportion of unemployed people with high level VII of educational attainment increased from 2.3%, in December 2009, (Pantelić et al., 2011) to 3.7%, in December 2010.

Table 2. Unemployed persons by level of educational attainment1, by age and by gender.

<table>
<thead>
<tr>
<th>Level</th>
<th>Total Number</th>
<th>%</th>
<th>Male Number</th>
<th>%</th>
<th>Female Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>I level</td>
<td>2,144</td>
<td>35.2</td>
<td>1,020</td>
<td>35.3</td>
<td>1,124</td>
<td>35.2</td>
</tr>
<tr>
<td>II level</td>
<td>353</td>
<td>5.8</td>
<td>186</td>
<td>6.4</td>
<td>167</td>
<td>5.2</td>
</tr>
<tr>
<td>III level</td>
<td>1,567</td>
<td>25.7</td>
<td>928</td>
<td>32.1</td>
<td>639</td>
<td>20.0</td>
</tr>
<tr>
<td>IV level</td>
<td>1,490</td>
<td>24.5</td>
<td>543</td>
<td>18.8</td>
<td>947</td>
<td>29.6</td>
</tr>
<tr>
<td>V level</td>
<td>34</td>
<td>0.6</td>
<td>26</td>
<td>0.9</td>
<td>8</td>
<td>0.3</td>
</tr>
<tr>
<td>VI-1 level</td>
<td>186</td>
<td>3.1</td>
<td>62</td>
<td>2.1</td>
<td>124</td>
<td>3.9</td>
</tr>
<tr>
<td>VI-2 level</td>
<td>83</td>
<td>1.4</td>
<td>26</td>
<td>0.9</td>
<td>57</td>
<td>1.8</td>
</tr>
<tr>
<td>VII-1 level</td>
<td>223</td>
<td>3.7</td>
<td>97</td>
<td>3.4</td>
<td>126</td>
<td>3.9</td>
</tr>
<tr>
<td>VII-2 level</td>
<td>6</td>
<td>0.1</td>
<td>2</td>
<td>0.1</td>
<td>4</td>
<td>0.1</td>
</tr>
<tr>
<td>VIII level</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Unqualified (I+II)</td>
<td>2,497</td>
<td>41.0</td>
<td>1,206</td>
<td>41.7</td>
<td>1,291</td>
<td>40.4</td>
</tr>
<tr>
<td>Qualified (III-VIII)</td>
<td>3,589</td>
<td>59.0</td>
<td>1,684</td>
<td>58.3</td>
<td>1,905</td>
<td>59.6</td>
</tr>
<tr>
<td>Total</td>
<td>6,086</td>
<td>100</td>
<td>2,890</td>
<td>100</td>
<td>3,196</td>
<td>100</td>
</tr>
</tbody>
</table>


The analysis of unemployed persons in Kikinda municipality from January 2007 to December 2010 (figure 2) shows the following situation: the unemployment rate varies and the highest unemployment rate was recorded in March 2007. It declined from March to December 2007, mostly because a law was enacted in 2007 by which unemployed persons do not have to be registered by National Employment Office in order to have the right to health care. A large number of persons wanted to be removed from the registry of the National Employment Office even though they were still unemployed. In the beginning of 2008, there was an increase in the unemployment rate and this trend maintained until April 2008, when the unemployment rate started to decline again. In the beginning of 2008, a few large companies were privatized in Kikinda municipality causing layoff of a large number of employees, which is the main reason for the increase in the unemployment rate. From April 2008 to November 2008, the unemployment rate declined, when a mild increase can be observed lasting until January 2009. From January 2009, in Kikinda municipality it decreased steadily, and it reached its minimum of 13.5 ‰ in October 2010. By the end of the observed period, the unemployment rate was 14.3 ‰, which is less by 5.3% than in January 2007.
Although it used to be a big industrial centre, Kikinda is, economically, almost devastated today. Transition consequences can be felt and a large number of people who were left jobless for various reasons were sent to the job market. A large number of unemployed appeared due to privatization of a large number of companies. Positive effects of privatization are scarce, whereas the negative ones are in full force. Transition has its economic and social price. The money obtained by selling of shares or unemployment compensation for laid-off workers was not collected and invested in production, but spent on acquiring various assets. Peripheral parts of Banat are not attractive for migrants from other regions. Highly educated persons seek relocation in bigger economic centres in search for employment. They are very often ready to accept temporary employment and employment requiring lower level of educational attainment, which are much better paid there than in local areas.

Fig. 2. The unemployment rate in Kikinda municipality from January 2007 to December 2010.

4. CONCLUSION

Based on the given data, we can observe that the percentage of unemployed persons is rather large when compared to the total population in Kikinda municipality. Unemployment issues on the territory of Kikinda municipality have been present for the past few years, even though the data of National Employment Office shows trends of stagnation and mild decrease in unemployed persons. Unfortunately, the largest number of people decided to remove themselves from the registry of National Employment Office because they believe that this institution cannot help them in finding employment.

As regards age structure, research results show that Kikinda municipality is dominated by very young and the most active work-age population in the age group 30-34. The smallest proportion in the total number of unemployed persons are people in the age group 60+, since most of this population group (especially female) have fulfilled requirements for retirement. There is also a smaller proportion of persons younger than 19 years, because most of the members of this age group are still studying. The structure of unemployed persons by level of educational attainment shows that there is the highest percentage of persons with level I of educational attainment, followed by levels III and IV.
of educational attainment. What is very negative is that there is a large proportion of unemployed persons with higher levels of educational attainment - from V to VIII.

There are many possibilities for the revitalization of the depopulated areas. As one of the main causes of depopulation of this region is low fertility rate, which is insufficient to ensure reproduction, it is necessary to first implement the pro-natalist population policy measures. Also, the problems of depopulation can be decreased by retaining young population (Ivkov et al., 2007), in the way that new job openings would be provided and conditions for a quality life would be created. Supporting and development of tourism can provide chances for new job openings. Although youth and working-age population are a priority, older categories of population should be involved in contributing to the development, within their range of abilities. This is the way to decrease the number of unemployed persons in the age group 50+, which is also a group which is the most difficult to get employed.

Considering the fact that a high percentage of the population is employed in agriculture, one of the solutions could be to improve the situation in agriculture. A special advantage should be given to agritechnical measures, firstly irrigation, as well as vegetable production in open and closed areas (Romelić, Tomić, 1992). Great significance should be assigned to various support programmes (Brown et al., 2008, Boeri, Macis, 2009), which have an incentive role in activating unemployed persons and offering them help in finding employment. Each year, National Employment Office (NEO) organizes: programmes for employment of persons with special needs; programmes for self-employment; regional programmes; programmes for professional training of interns; volunteers and trainees; incentive programmes for employers – partial tax allowance for hiring persons over 45 or 50 years old; educational programmes for small business start up and management; educational programmes for active job search; organizing courses in computers, foreign languages, book-keeping... (NEO, Kikinda, 2010). Implementation of these programmes can significantly decrease unemployment in Kikinda municipality.

ACKNOWLEDGMENT

This paper is part of the project No. 114-451-1135/2014-01 funded by the Provincial Secretariat for Science and Technological Development of the Vojvodina Province, Serbia.
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THE TYPOLOGY OF THE SETTLEMENTS IN BÂRGĂU DISTRICT (ROMANIA)

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Abstract. The typology of settlements is an important factor in the regional geographical analysis of a territory. In order to make a typology there are used a large number of indicators, thus outlining a complex image of the system of studied settlements. The region has a strong rural character, consisting of four municipalities, all of them bearing the name “Bârgău”. Analyzing the localities by number of people, structure, texture, function, spatial distribution one can identify the problems they are facing, and the interventions to remedy the situation in order to achieve optimal living standards. This paper aims to emphasize the main aspects concerning the demographic dimension, structure and texture of the settlements, as well as the function and spatial distribution of the human settlements in Ținutul Bârgăului (Bârgău District) by means of morphologic and quantitative indicators. The morphology of the area plays and important role in the distributionpd the settlements, four groups specific to the altitudinal levels being identifies. Thus, the majority of the settlements (6 of the total 13) are situated between 600-1000 m. The morphology of the settlements has changed in time due to the activity in this district of the II Romanian Border Regiment between 1783 and 1851, so that the majority of the villages with irregular shape changed due to imperial orders to a simple linear or linear-tentacular shape. The functional typology of the settlements in Bârgău district was subject to numerous changes. The presence of high quality pastures and meadows determined the economic profile of the settlements, by the development of the zootechnical sector. The presence of forests determined the development besides the agricultural activities of the wood and timber exploitation activities in most settlements. After the analysis of all the indicator we can perceive the great humanisation of the studied geographical area.

Keywords: settlements, demographic dimension, density, quantitative distribution, spatial distribution.
1.1. INTRODUCTION

According to the Explanatory Dictionary of the Romanian Language, the notion ținut is “a larger territory which used to represent an administrative unit”, “place”, “region”, “zone”, “country”, “realm”, “a territory of large extension having certain specific traits (in terms of climate, relief, economic resources), “an administrative-territorial unit within a state” but also “a dominion and dominated region”.

From these definition we may conclude that the ținut is characterized by spatial (place, geographic surface, territory), structural (relief, climate, vegetation) and political-administrative valences, eventually emerging as an administrative-territorial entity. In the Administrative Law of 1938, passed by the Royal Decree 2191, the ținut is defined as an “administrative unit with economic, cultural and social attributions”, having as subdivisions the county, the plasa and the commune. As administrative unit, the ținut disappeared in the year 1940, being nevertheless perpetuated in the geographical area by means of its mental valence. Thus, the new mental space appears in the area of geography as a regional taxon, resembling the regional system of the lands, remaining however inferior to them. (P., Cocean, 2010).

The term mental space represents ”a territory that a community, as well as an individual belonging to it, integrate in their own scale of existential values through perception (l'espace perçu), experience (l'espace vecu) and imaginary (imagined space ” (P., Cocean, 2010). As such, the mental space is characterized by the spatial dimensions of: the perceived space (l'espace perçu) representing ”the image that the individual or the community has about a place, a region, the way it is reflected on a sensory and mental level” (P., Cocean, 2010), the experienced space (l'espace vecu) ”combines the concepts of the social life space, adding to it the psychological values attached to the place” (A., Fremont, 1976, 1999, P., Cocean, 2010), the imagined space ”is born of the information received by the individual from various sources (books, mass-media, oral descriptions) as well as of the compositions of the individual’s imagination” (P., Cocea, 2010), so that eventually the regional space includes all the above mentioned space types.

The geographic space, hereinafter called Ținutul Bârgău/the Bârgău District, lies on the southern side of the Bârgău Mountains, belonging to the superior and middle basin of the Bistrița River and its affluents Bârgău and Bistricioara. This mountainous, intensely inhabited space evinces a well individualized level of erosion: the platform of the Bârgie, with an appearance of smooth plains, dominated by volcanic hills, with altitudes ranging from 1000 to 1100 m, covered in woods, meadows and hayfields, characterized by a large spreading area of dwellings and temporary households, extending towards the south, to the foot of the Călimani Mountains. The area of this spreading marks with great precision the contact of the Bârgău Platform with the eruptive mass of the Călimani mountains (Fig.1).

This ținut has been inhabited since ancient times, the settlements being documentarily attested as early as the 14th century. In 1317 it was named Borgo, in 1328 Paro, in 1390 vilis altrisque Borgo, in the year 1599 we have the name pro utroque Borgo, in 1548 Borgo superior et inferior, in 1549 Borgo maiori, and in 1561 Burghau. In

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the year 1328 we find its name in the syntagm Neppendorf et Burgo, being made up of two dominions: Borgoul de Sus (Felső Borgó) and Borgoul de Jos (Alsó Borgó) as component part of the Doboca county. The two Bârgaie are also mentioned in the fiscal conscription of 1750. In the 8th century the names of the localities Josenii, Mijloceni, Prund, Colibița and Tiha appear in a statistics. In the year 1870 we find attestation for Rusu Bârgăului, Josenii, Susenii, Prund, Bistrița, Tiha and Mureșenii Bârgăului. The inhabitants of Ținutul Bârgăului adhered in the course of time to the same cultural, spiritual, mental and linguistic values, thus outlining the clear identity of this space in relation to the neighbouring territories (Țara Dornelor, Țara Năsăudului), which came to the surface in the inhabitants’ awareness of belonging to these places, in their feeling of calling themselves bârgăuani (inhabitants of Bârgău), respectively in their psychological and behavioural characteristics of arrogance, intrepidness, cheerfulness and hospitality.

The emergence and the development of the settlements in this district were influenced both by the presence of man and of the Bistrita river, by the shelter offered by the Bârgău and Călimani mountains, as they evolved in a close relationship to the resources they provided. The way of life and the activities of the population in this valley were defined by the existing resources, thus laying the foundations for wood cutting and processing, as well as for shepherding. Bârgăuani focused on the manufacturing of timber, traverses and other wooden objects which they traded for grains in the plain, thus developing a genuine wood culture and completing the culture of the Romanian people and of the Romanian spirit.

The main objective of this work is that of analyzing the habitat from the geographic space of the Ținut of Bârgău, following the evolution and the major changes that have occurred in the demographic dimension, the physignomy, the functioning and the layout of the settlements, in order to obtain a thorough vision over the territory, sustaining in this way the possibility of identifying existing dysfunctional issues, and giving the chance in the future to fix the problems and to maintain a decent standard of living.


The work methods employed in writing this paper are meant to highlight the succession thread of the undertaken actions, the finale of which should efficiently represent the desideratum of this analysis. In order to create the database, the analysis and the graphical and cartographical representation of the results obtained by processing information provided by the population censuses from the years 1850, 1900, 1956, 1966, 1992, 2002, 2011 in the form of graphics and thematic maps we used the software Microsoft Office Excel and ArcGis 9.3.

The organization of the households, the structure and the typology of the villages as well as their distribution indicate the close relationship between the local people and the environment.

Ținutul Bârgăului comprises four communes and no urban settlement. This is why we can assert that the excessive ruralization is the main feature of this regional system of the ținut-type. The optimal functionality is insured by the extra-regional polarizing centre, the town Bistrita, lying very close to the ținut.

The classification of rural settlements abides by several criteria: the demographic dimension, the structure, the texture and the economic functions.
1.2. CLASSIFICATION OF SETTLEMENTS

The most important factors influencing the demographic dimension of a settlement are the natural dynamics and the territorial mobility, which have always had a significant contribution to the dimensional changes of settlements. In order to highlight this fact we took into account the statistical data of the years 1850, 1900, 1956, 1966, 1992, 2002 and 2011.

In order to analyse the number of inhabitants of the rural settlements of the Ținutul Bârgău we considered the following relevant categories: small rural settlements (under 500 inhabitants) with a sub-category of very small villages (under 200 inhabitants), settlements of inferior medium size (501-1000 inhabitants), settlements of superior medium size (1001-1500 inhabitants), large villages (over 1500 inhabitants) with a sub-category of very large villages (over 4000 inhabitants).

The establishment of the very small rural settlements in this area is linked to the year 1966, when the village Strâmba of the commune Josenii Bârgăului, which had 169 de inhabitants, was transferred from the category of hamlets into that of villages after the second rectification of the Soviet-type administrative organization in 1956. In 2011 the village Cioasa of the commune Tiha Bârgăului entered this category with a population of 142 inhabitants, even if in the period 1956-2002 it had a population of more than 200 inhabitants it belonged to the superior category. The numeric decrease of the population between 2002-2011 owes to the young and adult population migration due to economic constraints as well as to the high rate of mortality among the remaining elderly population.

Small villages emerged as a consequence of the same processes of transferring hamlets in the category of villages, so that in 1965 the hamlets Colibița, Cioasa and Piatra Fântânele became villages with a population below 500 inhabitants. In 1966 we notice the existence of two small villages, the village Colibița passed into the category of the inferior medium ones with a population of 731 inhabitants. In the year 1977 three more villages entered this category as a consequence of the population’s growing over the 200 inhabitant threshold of the village Strâmba. Until 2002 their number recorded no change, but the data of that year’s census show the demographic regression of the village Colibița, which thus entered the category of small villages. In 2011 the number of small villages remained the same. The social-economic realities, the accentuation of the phenomenon of demographic ageing, the migration of the active population are the factor that led to the impossible demographic recovery of these villages. Even if two of these settlements, Colibița and Piatra Fântânele, have important resorts with local and regional influence, whereto the population is attracted in the summer and winter seasons, this does not improve the population’s evolution since the tourists are present only temporarily.

Medium size rural settlements have a population between 501-1500 inhabitants. In order to perform an analysis thereof this category was divided into villages of inferior medium size villages and superior medium villages respectively.

In the category of villages of inferior medium size fall the rural settlements with population numbers between 501-1000 inhabitants. In 1850 four villages entered this category: Rusu Bârgăului, Susenii Bârgăului, Mijloceni Bârgăului and Mureșeni Bârgăului. Due to the demographic recovery, in 1900 the number of inferior medium size villages dropped, so that only the villages Rusu Bârgăului and Susenii Bârgăului fell into this category, while the other two (Mijloceni Bârgăului, Mureșeni Bârgăului) passed into
The typology of the settlements in Bârgău district (Romania)

the category of the superior medium size ones, exceeding the 1000 inhabitant threshold. This slight demographic growth continued, so that in 1930 no rural settlement belonged in this category anymore. In 1966 the number of villages in this category rose due to the change of the status of small village into village of inferior medium size of the settlement Colibița. However, because of the demographic involution, Colibița went back to the category of small village in 2002. This demographic decline owes to the migration of the young population after 1990 as well as to the decrease of the natality rate and the significant rise of mortality among the elderly. In 2011 only one settlement was part of this group, namely Rusu Bârgăului.

The inferior medium size settlements comprise the villages with populations between 1001-1500 inhabitants. In 1850 three villages entered this category: Bistrița Bârgăului, Josenii Bârgăului and Tiha Bârgăului. Due to migration and the positive natural balance from 1850 to 1900, the villages Bistrița Bârgăului and Tiha Bârgăului went to the superior category, with only one village remaining in the lower category: Josenii Bârgăului. Thanks to the growing population, in 1930 Josenii Bârgăului entered the category of large villages. In 1956, in Rusu Bârgăului, the inhabitants’ number dropped below 1000 people, so that it went back to the category of inferior medium size villages. The census of 2011 placed in this category the villages Mijlocenii Bârgăului, Susenii Bârgăului and Tiha Bârgăului.

The large rural settlements whose population numbers range from 1501 to 4000 inhabitants, next to the medium size rural settlements, represent the dimensional category with an uninterrupted presence during the analysed period. Whereas in 1850 there was but one large rural settlement within the Ținutul Bârgăului, namely Prundu Bârgăului with 1519 inhabitants, in the year 1900 their number tripled, as the villages Bistrița Bârgăului and Tiha Bârgăului joined in. Due to the positive natural balance recorded in 1930, the village Josenii Bârgăului entered this category as well. In 1956 the number of villages in this dimensional category dropped, as the village Tiha Bârgăului returned to the group of villages of superior medium size when the hamlets Ciosa and Tureac passed into the category of villages, thus reducing the population numbers of Tiha Bârgăului. In 1966 Prundu Bârgăului went into the group of very large villages. Bistrița Bârgăului joined the category of very large villages in 1992, while Josenii Bârgăului, Mureșenii Bârgăului and Tureac stayed in the same category, while Mijlocenii Bârgăului and Tiha Bârgăului entered the category of large villages. In 2002, owing to the demographic regression, Bistrița Bârgăului returned to the category of large villages, staying on the same position in 2011 as well. In that year the number of large villages was four, as the villages Bistrița Bârgăului and Josenii Bârgăului, Tureac and Mureșenii Bârgăului joined in.

Within the group of very large villages fall the ones which present a high demographic potential of over 4000 inhabitants. These villages have been present in Ținutul Bârgăului since 1966, when Prundu Bârgăului was the only locality which belonged to this category. The culminating moment was year 1992, a time when two very large settlements existed in the district: Prundu Bârgăului and Bistrița Bârgăului. In 2002 and 2011 the initial number of very large villages was renewed. Only Prundu Bârgăului managed to maintain this level, with a population growth of 100 inhabitants in the interval 1992-2002 and in spite of a decrease in the demographic potential by 649 inhabitants until 2011. In the same period the population of the village Bistrița Bârgăului dropped under the 4000 inhabitant threshold, thus passing into the large village category. Owing to the high demographic potential, to the economic, social and cultural development, the village Prundu Bârgăului aspired in the
eighth decade of the 20th century to the status of town. We can thus assert that of the four very large villages of the Bistrița-Năsăud county, namely Feldru, Maieru, Prundu Bârgăului and Rodna (Cocean, P., 2011) one, Prundu Bârgăului, lies on the territory of the studied area, which developed as a former border center and due to its agro-industrial and cultural functions. In the jinut as a whole the proportion of large villages is 61.53% with a central position dominating the proportion of small villages of 38.47% which are localized peripherically in the mountainous area.

Before the establishment of the Romanian Border Regiment II Năsăud, the villages on the territory of this jinut evinced irregular shapes (areolar, tentacular). Due to the instauration of the military regime in 1783 many changes emerged in the physiognomic typology of these villages as opposed to mountainous areas where settlements with irregular boundaries predominate. In consequence of this militarization process done by imperial order, the authorities resorted to gathering the Romanian population from the forests and from the mountain versants and moving them along the valley of the Bistrita river, the settlements being systematized with a view to the severe instruction and education of the border population. Thus, simple linear villages such as Tiha Bârgăului and linear tentacular ones such as Bistrița Bârgăului (Fig.3.), Rusu Bârgăului and Josenii Bârgăului were shaped.

The degree of relief fragmentation and its declivity imposed the outlining of settlements with areolar shape such as Colibița (Fig.2) and Mureșenii Bârgăului. Nowadays we can identify four types of settlements, according to their shape:

- **linear tentacular ones**: Rusu Bârgăului; Mijlocenii Bârgăului, Susenii Bârgăului; Bistrița Bârgăului, and Tureac.
- **tentacular ones**: Prundu Bârgăului;
- **simple linear ones**: Strâmba, Tiha Bârgăului, Piatra Fântânele.
- **areolar ones**: Colibița, Ciosa.

Considering the district’s relief and the spatial criterion of the settlements we notice the presence of the three main structural types; however, some settlements combine the compact structure and the raveled and scattered structure. The main feature of large villages, especially of communes, is their morphostructural arrangement, so that the inner part of the locality mingles the features of a compact village, with households placed at its centre, with the features of a raveled village, with households placed along roads and with the features of the scattered village, with households dispersed on heights, versants and along brooks. The villages Rusu Bârgăului and Strâmba appear as settlements with compact structures. Josenii-, Mijlocenii, Susenii-, Prundu- and Bistrița Bârgăului have shapes of equalized nuclei with intercalations of raveling and even scattering towards the exterior.

The coupling of settlements, which is characteristic to the jinut, begins at the contact with the mountain, gradually climbing towards valleys and plains up to altitudes of 1000 m.

At Prundu Bârgăului the coupled settlement bifurcates. The first branch follows the course of the Bârgău Valley, by outlining the village Tiha Bârgăului, with raveled structure. Towards the defile area, the number of households drops, so that the villages Tureac and Mureșenii Bârgăului transform into an area of scatterings over the plains. The second branch follows the course of the Bistrita river, including the settlements Bistrița Bârgăului and Colibița. The village Colibița adopts a typical scattered structure and links to Mureșenii Bârgăului. The initial nucleus of these settlements is constituted by the three villages of the confluence zone of Bârgău with Bistrița, Prundu-, Tiha- and Bistrița Bârgăului. On the Zimbroaia surface there used to be the village Piatra Fântânele, with a scattered structure.
Another characteristic of villages is their intercalation with temporary dwellings. The inhabitants of this **ținut** perform their shepherding activities during summer in the **mountains**, so that temporary dwellings show up. These temporary dwellings are frequent in the areas Paltin, Dl Drăgan and Merezuri, situated on the watershed between the sources of Leșu and Ilva, Dl. Ingrădit between the valleys Iliuța Corchii and Iliuța Calului, on the heights Măgura Calului and Dealul Calului, between the valleys Teșna and Trifon, on the height Măgura Calului-Priporul Candrii, between the sources of the brooks Teșna and Trifon, on the hill Dealul Rusului, between the brooks Rusu and Trifon, on the height Zâmbru, between Trifon and Dornișoara, and on the height Culmea Șendroaia. As such, the compact villages are the most numerous in **Ținutul Bârgăului**. These settlements were subject, during the time of the military border, to an ample process of reorganization and systematisation, represented by "**Theresianism**" and "**Josephinism**" (Bădescu, I., Cucu-Oancea Ozana, Șișeștean, Gh., 2009). As a consequence, 3 of the settlements were moved down into the valleys and the households within the village’s perimeter, the spatial dispersal was forbidden and the street network was systematized. Nevertheless, this compact structure of settlements is intercalated with the ravelled and scattered one.

Based on the criterion of settlement **texture**, which reflects the structure of the street network, of the buildings inside the village perimeter, these localities are characterized by irregularity, having the appearance of linear villages inside their inner area. Thus we may distinguish settlements without texture (Colibița, Ciosa), settlements with linear textures (Tureac, Strâmba, Rusu Bârgăului, Susenii Bârgăului), with bilinear texture (Josenii Bârgăului, Mijloceni Bârgăului, Bistrița Bârgăului, Tiha Bârgăului), with rectangular structure (Prundu Bârgăului).

In defining the function of a settlement one considers the following indicators such as: the way the grounds are used, the professional structure of the population, the value of the material production and the proportion of the active population (Surd, V., 1993). **Ținutul Bârgăului** is characterized by the high proportion of the forestry fund, the superior quality of the meadows and hayfields, the high degree of scattering of the used agricultural surfaces, which are proof of the strong character of the agricultural economy. Based on these considerations, the dominant functional type, i.e. the agricultural function has been highlighted. Such settlements are Mijloceni Bârgăului and Mureșeni Bârgăului, characterized by the subsistence agriculture based on raising animals. One can also identify settlements with agricultural and industrial functions, characterized by the performance of activities specific to the secondary sector, namely by the development of the industry of wood cutting and processing. Such functions may be encountered in the settlements Bistrița-, Joseni-, Suseni- and Tiha Bârgăului. Due to the vast wooded areas there are a high number of economic agents performing activities in these fields. In the settlement Josenii Bârgăului, there are 100 economic agents, in Tiha Bârgăului, 50, and in Bistrița Bârgăului 19. Large orchards have been developed on the territories of the localities Bistrița Bârgăului and Josenii Bârgăului.

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Fig. 2. Colibița- areolar form
(source www.earth.google.com)

Fig. 3. Bistrița Bârgăului linear tentacular form.
(source www.earth.google.com)
The agricultural and sylvan function of the village Bistrița Bârgăului is completed by its energetic function, due to the existence and function of the hydroelectric plant situated downstream from the accumulation lake in Colibița.

The localities with mixed functions, in which the population is employed in the three sectors in relatively equal proportions are Prundu Bârgăului, Colibița and Piatra Fântânele. In Prundu Bârgăului, a polarizing centre of the 3rd order, such agricultural activities as sheep raising, processing industry and services in the fields of finances and banking, trade, education, medicine and ambulance services are quite balanced. It was in this locality that the first paper mill was set up in 1786, later transformed into a paper factory; the RAAL factory, which produces cooling systems for building equipment and agricultural machines, created 1000 work places. The settlements Colibița and Piatra Fântânele evince very good touristic potentials, next to agricultural activities, based on the presence of such touristic objectives as the Colibița Lake, the Dracula Castel Hotel, the ski slope, the Monastery "Nașterea Maicii Domnului" in Piatra Fântânele.

The spatial distribution of the settlements is an important factor in analyzing the habitats within a geographical space and it can be approached from two perspectives: a quantitative and a morphological one. The data used to calculate these indicators are the ones provided by the census of 2011.

The quantitative distribution of the settlements is effected by means of the following indicators:

The settlements’ density – the 13 settlements in Ținutul Bârgăului are scattered over a surface of 488,4 km², so that the medium density is 2,66 localities/km². Compared to the medium national value of 5,06 localities/km², we get an inferior value. This owes to the high degree of the households’ scattering in the mountainous area, as well as to the existence of vast areas with no settlements. In communes one notices the existence of densities with values inferior to the national average in the case of the communes Bistrița Bârgăului (1,07), Tiha Bârgăului (2,5) and Prundu Bârgăului (4,2), as well as with superior values in the case of the commune Josenii Bârgăului. This superior value owes to the small territory of the commune’s surface (55,6km²) occupied by a large number of settlements (4

The density of the conventional settlements – refers to the territorial repartition of the localities with conventional areas. It is calculated by relating the inhabitants’ number of the administrative unit to that of the localities. The value obtained for the ținut is as high as de 1739,15. By relating the total population number of the administrative unit to the obtained value, by referring to 100 km², we get the number of conventional localities within the territorial-administrative unit. We notice high values in the commune Prundu Bârgăului, namely 7,89 conventional settlements/100 km² and lower ones in the communes Bistrița Bârgăului, namely 1,35 conventional settlements /100 km² and Tiha Bârgăului with a value of 1,85 inhabitants /100km².

The areal coefficient is obtained by relating the surface of the administrative unit to the number of the localities it comprises. The value obtained represents the surface corresponding to the component settlements. The value obtained for the entire ținut is 37,56km²/locality, situated much above the national value of 18,1 km²/locality. As far as the communes are concerned, these vary between 13,9 km²/locality in the commune Josenii Bârgăului and 39,8 km² in the commune Tiha Bârgăului. This coefficient is in inverse ratio to the density of the settlements, so that the units with high values of settlements’ density evince low values of their areal coefficient (commune Josenii Bârgăului).
The medium distance between settlements is equal to the value obtained by extracting the radical of the areal coefficient. In Ținutul Bârgăului the medium distance is 6.12 km, which is above the national level (5.1 km).

The dispersion index gives the degree of territorial scattering of settlements. It is calculated by using A. Demangeon’s formula:

\[ Id = \frac{(N-N^*)n}{N} \]

where:
- \( N \) - the unit’s population
- \( N^* \) - the administrative population
- \( n \) - number of the unit’s component localities

The value of the index varies within the district from 0.19 in commune Bistrița Bârgăului and 3.76 in commune Tiha Bârgăului. The low values characterize the communes which comprise a low number of villages (Bistrița Bârgăului and Prundu Bârgăului, which are composed of 2 settlements). The high values are characteristic of communes with a large number of structures.

The district of Bârgău is crossed by the major road DN 17. Most of the localities are crossed by this road or at located at less than 5 km from it. The villages with a high degree of isolation, located at more than 20 km are Strâmba, Colibița and Ciosa. The district is partially crossed by the railway which makes the link between the town of Bistrița and the village of Bistrița Bârgăului.

Fig. 4. The altimetric distribution of settlements.
The altimetric distribution of settlements is conditioned by numerous lithologic and tectonic factors, by the fragmentation degree of the relief, by the organization and density of the hydrographic network.

Under the height of 600 m the Strâmba, Josenii-, Mijlocenii and Rusu Bârgăului villages are situated. Between 601 – 800 m the villages are developed in the lowlands: Bistrița-, Prundu-, Susenii Bârgăului. Between 800 – 1000 m the villages that belong to the commune of Tiha Bârgăului (Tureac, Mureșenii Bârgăului,Tiha Bârgăului) and Colibița (commune Bistrița Bârgăului) are developed. Only two of them, Ciosa and Piața Fântânele are located at more than 1100 m. (Fig 4.).

CONCLUSIONS

Due to the particular features of the natural environment, the southern area of the Bârgău Mountains gave birth in time to a habitation area whose anthropization vectors were the hydrographic networks Bistrița and Tiha (Bârgău). This morpho-hydrographic axis shelters a united network of settlements that the local people call "The United States of Bârgău". The specific trait of these settlements is their development along the rivers Tiha and Bistrița, which drain the entire territory of eight villages of the whole number of thirteen, all of which are called Bârgău. The density of the settlements shows values inferior to the national average, due both to the morphological conditions and the predominance of the middle, large and very large villages. There are also differences in the indicators which show the repartition of settlements. The morphologic distribution of the settlements indicate the development of a large number of localities (7), at altitudes ranging from 600 to 1000 m, both in the Prundu Bârgăului Depression and in the interfluve areals of Tiha-Bistrița, as well as their resilience to the morphological conditions, at the same time illustrating the necessity of extending the settlements’ boundaries due to their geodemographic potential. The morphology of the village boundaries underwent changes as a result of the establishment and functioning of the Romanian Border Regiment II Năsăud in the time span 1783-1851, so that most of the villages with irregular shapes changed, as a result of the imperial orders, into villages with simple linear and linear-tentacular shapes.

The functional typology of the settlements in Ținutul Bârgăului was subjected to many changes. The existence of high-quality hayfields and meadows has defined the economic profile of the settlements in this ținut and led to the development of the zootechnical field based particularly on the raising of bovines and ovines. Thanks to the rich forestry fund, next to agricultural ones, activities in the field of wood cutting and processing have developed in the majority of the settlements. The largest number of the population perform forestry activities in their own households, and occasionally in other households as well. Next to the settlements with agricultural functions emerged the ones with agricultural and industrial ones based both on the primary cutting and processing of wood and on machine constructions and electrical energy production (the micro hydroelectric plant in Bistrița-Bârgăului) and even on green energy (Eoliene-Piatra Fântânele). The traditional handicraft activities, among which pottering, weaving, manufacturing of sheepskin clothing and sofas are constantly loosing ground because of the precarious financial situation of the population and the market-invasion by the larger companies.

The classification of the settlements, the analysis of the numerous indicators offer us a clear vision on the studied territory and an opportunity to identify the existing
dysfunctionalities and the possible remedies or even their prevention in the future in order to reach a decent standard of living.

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METHODS AND TECHNIQUES FOR RESEARCH OF MINERAL WATERS FROM THE EASTERN CARPATHIANS

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Abstract. The study of mineral waters from the Eastern Carpathians dates back to the early 17th century, when the first geological and chemical descriptions appeared. Since then a number of synthesizing studies appeared on the topic of provenance, geochemistry and medical effect of the mineral water springs and spas. Starting from the 20th Century, as a result of the developing analytical techniques, new, innovative methods appeared, such as the use of stable isotopes of oxygen ($\delta^{18}$O) and deuterium ($\delta$D), which gave new information mostly on the origin of mineral waters and helped identifying the present ongoing geochemical processes. This paper aims to summarize the theoretical background of the analytical methods based on the investigation of stable isotopes and highlights most of the results achieved in the Eastern Carpathians, including recent data from 2012-2013.

Keywords: mineral water, stable isotopes, $\delta^{18}$O, $\delta$D, Eastern Carpathians

1. INTRODUCTION

The use of stable isotopes in the research of groundwater is a fast spreading method during the last decades. This method is a suitable tool for several applications, e.g. determining the origin of the groundwater, revealing geochemical processes like evaporation, water-rock interaction, residence time, mixing, etc., that groundwater goes through during its path. The stable isotopes, as conservative tracers are complementary to chemical information and provide insights into several processes that are difficult to trace by chemical means.

In the research of mineral waters in Romania, the use of stable isotopes first appeared in the second half of the 20th Century. It provided new information for the exploitation and proper use of mineral waters.
In our paper we summarize the theoretical background of stable isotopes, provide short description of how it become popular in Romanian research and present new results achieved in 2012-2013 on saline mineral waters from Mureș-County. Our aim is to promote the application of stable isotopes, as a quick and accurate method in the research of the origin of mineral water.

2. GENERAL PRINCIPLES

The principle of the use of stable isotopes consists in the measurement of the ratios of the two most abundant isotopes of an element. For oxygen it is the ratio of $^{18}$O with a terrestrial abundance of 0.204% and $^{16}$O, which represents the 99.796% of abundance. The $^{18}$O/$^{16}$O ratio is about 0.00204, but this value is normally influenced by fractionation processes. For hydrogen, it is the ratio of $^2$H or deuterium (D) with an abundance of 0.0156% with respect to H. Carbon has two stable isotopes $^{12}$C and $^{13}$C. Their abundance is about 98.8% and 1.1% and the $^{13}$C/$^{12}$C ratio is 0.011 (Mook, 2001).

The isotopic concentrations are usually expressed as delta ($\delta$), representing the difference between the measured ratio in the sample and the ratio in a certain reference. Processes like evaporation, condensation, melting, etc. have an effect of isotope differentiation. The variations in the isotopic composition, produced by chemical or physical processes, in compounds or phases, present in the same system are called isotopic fractionation (Mook, 2001).

For stable isotopic concentrations of oxygen and deuterium in the water, the standard solution to which values are referred is SMOW (Standard Mean Ocean Water), introduced by H. Craig (1961). Later on, this standard was replaced by the VSMOW (Vienna Standard Mean Ocean Water).

Results are compared to the GMWL (Global Meteoric Water Line), defined by Craig (1961), as the relationship between $\delta^{18}$O and $\delta$D at global scale in fresh surface waters. The equation given by Craig is $\delta$D=$8\delta^{18}$O+10‰, later modified by Rozansky et al. (1993) to $\delta$D=$8.13\delta^{18}$O+10.8.

The Global Meteoric Water Line (GMWL) represents the average of several local and regional meteoric water lines which are different from the global line due to climatic and geographic reasons (origin of vapour mass, evaporation during rainfall, seasonality and amount of precipitation, topography and geographical latitude). Cold regions usually are depleted in heavy isotopes while in arid and warm climate, waters are enriched in heavy isotopes. The slope of the GMWL is 8 and the so-called deuterium excess is +10. The deuterium excess d is defined as $d$ excess=$\delta$D-8*$\delta^{18}$O (Dansgaard, 1964). Any deviation from the GMWL is characterized by a specific phenomenon that occurred during groundwater flow.

Waters laying on the GMWL are defined as meteoric water, referring to water that originated from precipitation. It can be the rain, snow, ice, river water, lake water, groundwater, ocean water or sea water as well. Most groundwater resources are of meteoric origin, having a negative delta value. The ocean water has $\delta^{18}$O and $\delta$ D values of 0 ‰ VSMOW (Craig, 1961).

The isotopic composition of groundwater is in most cases controlled by meteorological processes. Several effects, like temperature and altitude have a great influence on the isotopic composition. As water molecules with differing molecular mass
have different vapour pressure, the lighter isotopes will become enriched in the more volatile phase, as opposed to the less volatile phase during a change of the phase (evaporation, condensation, sublimation). Temperature usually decreases with increasing altitude, and delta values will correspondingly drop. Gradients in δ^{18}O of -0.15 to -0.4 ‰/100 m are observed, while the gradients for δD are about 8 times larger (Craig, 1961).

There are geological conditions where the groundwater and the aquifer matrix or subsurface gases can modify the water’s meteoric signature. Water-rock interactions mainly occur at high temperature and over long periods of time, but can also be observed in shallow groundwater flow systems at low temperature. The alteration of the isotopic composition of groundwater gives insight into its subsurface history and geochemical reactions.

The isotopic and chemical composition of groundwater reflect the mineralogical composition of the rocks in the aquifer and can be used to localize recharge areas and to determine the origin of groundwater (meteoric, marine, fossil, magmatic and metamorphic) and of individual chemical components, including carbonate, sulfate, nitrate and ammonium (Mook, 2001).

3. INVESTIGATIONS ON THE ORIGIN OF MINERAL WATERS FROM THE ROMANIAN CARPATHIANS USING STABLE ISOTOPES

From the 20th century the hydrogeological research focused on the prospecting of thermal and mineral waters for establishing new balneological treatment centres or for the bottling industry. The researchers began to study the origin of groundwater and to identify possible water resources suitable for economic capitalization (Blaga et al., 1984, Crăciun et al., 1989).

A first series of studies on the isotopic pattern of the mineral/thermal water in western Romania has been initiated by Tenu in the 1970s. The detailed hydrogeochemical and isotopic data he obtained have been instrumental for better understanding the water origin and circulation, the recharge pathways and amounts, residence time, and the groundwater velocity (Tenu, 1981).

Blaga et al. (1984), have performed deuterium measurements in mineral water from several balneological centres in the Southern and Eastern Carpathians, and the Transylvanian Depression – Călimănești, Sângeorz Băi, Băile Someșeni, Bazna (Fig.1).
Methods and techniques for research of mineral waters from the Eastern Carpathians

Fig. 1. Map of the locations the Eastern Carpathians and Transylvanian Depression where stable isotope measurements were made
(source of map: Google Earth, locations: see text and references)

In the area of the Neogene to Quaternary volcanic chain, the first studies came later (Crăciun et al., 1989). Within the Călimani-Gurghiu-Harghita mineral waters were analysed from the point of view of salinity, $^{18}$O and D isotopic composition. The source and type of the analysed waters were different: from volcanic rocks (Miercurea Ciuc, Mădăraș Ciuc), crystalline limestones (Borsec, Toplița), and from the Carpathian flysch area (Băile Tușnad) respectively. These investigated mineral waters were of Ca–HCO$_3$ and Na–HCO$_3$ type with high salinity (900-6000 mg/l) and CO$_2$ content. The stable isotopic composition of these waters revealed their meteoric origin, with values close to the Global Meteoric Water Line (GMWL), $\delta^D < -70$ ‰ , $\delta^{18}O = -(12-10)$‰ with respect to the SMOW. It was suggested that the meteoric water infiltrates on the areas with higher elevation and during its descending path gets enriched with the CO$_2$ coming from deep layers, and the hypothesis of waters being of juvenile origin was completely declined (Crăciun et al., 1989) (Fig. 2).
Fig. 2. The stable isotopic composition of some mineral waters from the Eastern Carpathians
(Craig, H., 1961; Crăciun et al, 1989; Vaselli et al, 2002; Cuna et al, 2007; Főrizs et al, 2010; Magdas et al, 2009, Kis, 2013)

The mineral water springs from Sângeorz Băi, Şanţ, Ilva were monitored during one year of observation. The δD values were similar to the waters of the rivers from the studied area suggesting that they are meteoric in origin. Proof of meteoric origin was also given by the temperature, salinity and stable isotopic variations. The waters were highly affected by evaporation during warm seasons. Mixing phenomena between meteoric waters and a deep component was demonstrated in case of Valea Mare borehole (Papp, D.C., 2000).

A comprehensive study on the origin of fluids from the Eastern Carpathians using chemical and stable isotopic data (δ¹⁸O) of 72 mineral water springs was performed by Vaselli et al. (2002). In the case of highly mineralized waters also the δD content was measured. The investigated waters followed a transect from W to E from the sedimentary area of the Transylvanian Basin through the volcanic chain, reaching the Carpathian flysch area. Except the highly mineralized Na-Cl type of waters, the springs are of meteoric origin, having an isotopic composition of δ¹⁸O ranging between −8 and −12‰ vs. SMOW similar to the isotopic composition of precipitation on 1000-2000 m altitude (Vaselli et al, 2002).

On the origin of highly mineralized waters the relationship between the salinity and stable isotopic composition was investigated. The high shift on some of the samples could be explained by evaporation, however the high salinity of the waters could have influenced the bounds between the water and the dissolved ions. According to another hypothesis the mineral waters are the result of a mixing between meteoric water and a deep circulating groundwater with a different isotopic composition already gone through isotopic exchange with the host rock (Vaselli et al, 2002).
More recently, some touristic and therapeutic centres of the country, as Covasna and Băile Tușnad were studied (Berdea et al., 2005, Cuna et al., 2007, Papp and Nițoi, 2006) with the aim to define the water’s origin. The mineral waters from Covasna are of meteoric origin having a δD < – (90 - 65) ‰ vs. VSMOW and δ¹⁸O = – (12 - 6) ‰ vs. VSMOW. The isotopic composition is similar to the surface waters of the study area, with slight isotopic shift of oxygen suggesting mixing with waters of deep circulation.

In the case of Băile Tușnad, new data completed the previous investigations (Papp and Nițoi, 2006) that investigated the mineral waters to define their origin and to highlight some geochemical processes like water-rock interaction, underground dynamics and mixing. The results they have reported reveals the meteoric origin of these waters δD = – (82.6‰ - 72.6‰), consistent with the composition of surface waters δD = – (77.1‰ -73.6‰). The analysis also revealed the seasonal variations of these parameters, typically the characteristics of meteoric waters. The values measured in the thermal and mineral waters from Băile Tușnad were similar to the values from Tușnad Nou, δD = – 100 ‰ vs. VSMOW and δ¹⁸O= – 12‰ vs. VSMOW (Cuna et al., 2007).

Seasonal variations were also detected at springs from Borsec and Biborțeni, as well as some shifts in the oxygen isotopic ratio, suggesting mixing with waters of deeper circulation. The meteoric origin of waters was proven by the isotopic composition (Magdas et al., 2009).

The most recent studies were performed in the Ciuc Basin and neighbouring areas, renowned for its mineral water bottling industry. Besides the origin of water, they have managed to determine the influence of altitude on the infiltration of waters. Database on the springs from Borsec, Mădărăș Ciuc, Băile Harghita, Dânești, Racu, Șumuleu Ciuc, Miercurea Ciuc, Șâncrăieni, Cozmeni, Tușnad and Băile Tușnad revealed the meteoric origin of these waters having the isotopic composition of δD = – (77.2-85.4) ‰ vs. VSMOW and δ¹⁸O= – (10.36-11.88) ‰ vs. VSMOW (Főrizs et al., 2011).
In 2012-2013 stable isotopic measurements of hydrogen and oxygen were carried out on saline mineral waters to investigate their origin and relationship with the saline deposits. The examined locations were Orșova, Jabelnița, Idelciu de Jos and Aluniș from Mureș County (Fig.3). These springs and dug wells are used by local people in the household (saline water proper in the conservation of bacon and vegetables) or as local salty spas (Idelciu de Jos). The saline springs are kept safe in little spring-houses, so that no precipitation and pollution could affect the quality of the water.

**Table 1. The stable isotopic composition of mineral waters from Mureș County**

<table>
<thead>
<tr>
<th>No</th>
<th>Location</th>
<th>Salinity (g/l)</th>
<th>δ¹⁸O VSMOW</th>
<th>δD VSMOW</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Orșova</td>
<td>188</td>
<td>-10.05</td>
<td>-66.9</td>
</tr>
<tr>
<td>2.</td>
<td>Orșova</td>
<td>188</td>
<td>-9.51</td>
<td>-66.02</td>
</tr>
<tr>
<td>3.</td>
<td>Idelciu de Jos</td>
<td>11</td>
<td>-11.09</td>
<td>-82.47</td>
</tr>
<tr>
<td>4.</td>
<td>Jabelnița</td>
<td>74</td>
<td>-9.50</td>
<td>-66.08</td>
</tr>
<tr>
<td>5.</td>
<td>Aluniș</td>
<td>12</td>
<td>-8.68</td>
<td>-70.07</td>
</tr>
</tbody>
</table>

(Kis, 2013)
Salinity of samples ranged between 11-189 g/l. The oxygen isotopic composition ranged between $\delta^{18}$O = – (8.68 -11.09) ‰ vs. VSMOW, the deuterium composition ranged between $\delta D = – (66.0-82.5)$ ‰ vs. VSMOW (Kis, 2013) (Summarized in Table 1). The analysed samples plot on the Global Meteoric Line, suggesting their meteoric origin (see Fig. 2). These meteoric waters gain their salinity by leaching the salt deposits of the Transylvanian Basin and become mineral waters due to their high mineralization (NaCl content).

In some cases (eg. Aluniș) the isotopic composition shows a shift towards the heavier oxygen and hydrogen isotope suggesting evaporation processes (Fig.2). Evaporation can be facilitated by the high salinity of the samples. Mixings with shallow groundwater have not been demonstrated.

4. CONCLUSIONS

The use of stable isotopes is a suitable tool for several applications, e.g. determining the origin of the groundwater, revealing geochemical processes like evaporation, water-rock interaction, residence time, mixing, etc., that groundwater goes through during its path. The stable isotopes are complementary to chemical information and provide insights into processes that are difficult to trace by chemical means.

In the research of mineral waters in Romania, the use of stable isotopes provided new information for the exploitation and proper use of mineral waters. New results in the research of mineral waters, using stable isotopes were achieved in 2012-2013 on saline mineral waters from Mureș-County. Our results show the meteoric origin of the water, with high salinity content due to the geological background of the investigated area (salt diapirs).

ACKNOWLEDGEMENT

The present work was financially supported by POSDRU CUANTUMDOC “DOCTORAL STUDIES FOR EUROPEAN PERFORMANCES IN RESEARCH AND INOVATION” ID79407 project funded by the European Social Found and Romanian Government, the Sectoral Operational Programme for Human Resources Development 2007-2013, and co-financed by the Romanian National Research Council, Project PN-II-ID-PCE-2011-3-0537.
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REVEALING THE LANDSLIDE STRUCTURE USING THE ELECTRICAL TOMOGRAPHY TECHNIQUE. CASE STUDY: BUZAD ACTIVE LANDSLIDE

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Abstract. The electrical resistivity tomography (ERT) survey has been deployed to accurately shed more light of a small landslide located near the Buzad village, Timis County, Romania. This slide actually represents a local reactivation during 2006 of an old landslide. A 2-D resistivity survey along three profiles over the landslide main body using a Wenner configuration was performed in 2007, 2012 and 2014. The results obtained provide useful information about the geometry and characteristics of the landslide, the depth and extension of landslide body. The ERT measurements indicated some zones associated with both the high water content and the clay content within the landslide body, divided by a compact sandstone mass that influenced the slide development.

Keywords: landslide, Electrical Resistivity Tomography (ERT), geophysics, translational slide, Lipovei Hills

1. INTRODUCTION

Over the last 20 years, if compared to other methods, the geophysical methods become the most applied techniques in a broad spectrum of environmental studies, due to their main characteristics such as flexibility, non-invasive method of investigation, low cost and fast acquisition of high-resolution data and the possibility to investigate a large area (Jongmans, Garambois, 2007). One of these approaches refers to landslides investigations where geophysics has demonstrated a great potential to improve their study. Recently, geoelectrical ground imaging techniques, such as electrical resistivity tomography (ERT), have been more and more applied in the landslides research (Telford et al., 1990; Reynolds,
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1997; Batayneh, Al-Diabat, 2002; Bichler et al., 2004) even though this method has been used since 1970s (Caris, Van Asch, 1991; Bogoslovky, Ogilvy, 1997). It is acknowledged that scientific progress in landslides investigations is due to electrical resistivity tomography which seems to be a useful tool and a suitable technique to study some characteristics of landslides focused on geometry, internal structure, failure surface, water content, physical properties of landslide material and landslide mass movement (McCann, Forster, 1990; Hack, 2000; Lapenna et al., 2005).

Such a theoretical framework has recently been proposed by Lapenna et al. (2003) who investigated Giarrossa landslide by using ERT and self-potential (SP) surveys, Otto, Sass (2006) who used three geophysical methods (GPR, 2D ERT and seismic refraction) to assess the internal structure of two landforms in a high-alpine valley in Switzerland. Páněk et al. (2008) also considered Electrical Resistivity Tomography (ERT) a reliable instrument for the study and the analysis of various types of slope deformations. The above mentioned authors have shown that ERT method results are better for the areas with high resistivity contrasts in subsurface, sites with some lithology changes and with different ground water conditions (Páněk et al., 2008).

Similar results have been obtained by Hibert et al. (2012) and who applied the ERT method to detect the sliding surface and to estimate the thickness of the sliding material. Erginal et al. (2009) carried out an ERT survey to investigate a reactivation of an old landslide in Lapseki area, NW Turkey, paying attention to the subsurface structure of slip surface.

Although the use of ERT method is a common approach for landslides investigations in many countries, such studies are almost lacking in Romania. Most landslides studies in Romania have been focused on landslides susceptibility and hazard assessments in several regions of the country using quantitative or qualitative methods (Surdeanu, 1998; Driga, Ciupitu, 2007; Micu, Bâlțeanu, 2009), or on their spatial distribution (Posea et al., 1974). However, in the field of landslides research using geophysics there were several studies based, for instance, on the seismic profiles in an area affected by landslides (Maftei et al., 2008), geotechnical and geophysical methods (Vertical Electrical Sounding-VES) in order to determine local trigger parameter and to detect the existence and continuity of a potential sliding surface (Dobrescu et al., 2011). The study of landslides from Romania is mainly focused on the use of GIS methods, with important contributions made by Surdeanu et al., (2006b); Chițu et al., (2008); Chițu, Sandric (2009); Micu, Bâlțeanu (2009); Bâlțeanu et al., (2010); Micu (2011); Micu, Bâlțeanu (2013); Roșca et al., (2013) and less on geophysical investigations.

The application of ERT method on a translational landslide (Varnes, 1978) in the Lipovei Hills, Romania, aimed to reveal the landslide structure, water detection within the slip mass and to present the ERT advantages and limitations.

1.1. Study Area
The present geophysical study was carried out near Buzad village, Timiș County, Romania (Fig. 1). This hilly area, with altitudes exceeding 300 m, consists in Pannonian layers (clays, sands, marls, gravels) from Western Foothills. The mean temperature is 10° C, and the mean annual precipitation of 700-800 mm per year.
The Figure 2 illustrates the site of a shallow translational landslide reactivated in 2006 on approximately 90 m length and 40 m wide. Looking at the main body of landslide it is obviously that the soil is very disturbed especially in the shape of variable number of landslide furrows. The landslide morphology can easily be seen in the field and the depth of the rupture surface (amplitude of the main scarp) in 2007 was up to 2.5 m. The toe of the landslide has a domed shape, convex form and stationary in the most of the slope surface, unaffected by the movement.

2. METHODOLOGY

Two-dimensional (2D) electrical resistivity imaging surveys have been deployed along longitudinal profile in the study site, in 2007, 2012 and 2014. Data acquisition was performed by two different systems, namely: PASI instrument in 2007 and 2012 and GeoTom system in 2014. The PASI system used is a resistivity meter with multi electrode (16 SG24-N model), very useful for both the data acquisition and processing and to display a graphical representation. The GeoTom system for geoelectrical imaging can realize high quality 2D and 3D models, collected by a new 4-channel, multi electrode complex resistivity meter (Deen et al., 2013). A Trimble GeoExplorer XH 6000 GPS was used for the location of all 48 electrodes (GeoTom system) and for the topographic correction of all the profiles leveled in 2014.
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The ERT method is based on measuring the electrical potentials between one electrode pair while transmitting a direct current between another electrode pair (Sharma, 1997).

Resistivity data were collected using Wenner array configuration with different electrode spacing respectively 5, 3, and 4 m for the field surveys deployed in 2007, 2012, and 2014. This electrode configuration was chosen because this type of array is very sensitive to near surface heterogeneities. Data processing was achieved by using RES2DINV software. Here some topographical corrections were applied and the 2D inversion models were performed. This resistivity inversion software is based on the least-square method proposed by Loke, Baker (1996) and it is really necessary for the transformation of the apparent resistivity values achieved during the field measurements into real resistivity values of the subsoil. This algorithm assumes that the subsurface is divided into regular blocks, whose number corresponds to the number of measurement points (Colangelo et al., 2008). To obtain a better model we tried to reduce the difference between the calculated and the observed resistivity values using the iterative process. Also it is important to mention that in all inversion attempts the number of iteration was set to three.
during 2007 field survey respectively four in 2012 and 2014. Another parameter that gives an estimation of the difference we mentioned above is the Root-Mean-Squared (RMS).

A total of three resistivity tomography profiles were carried out, all ERT measurements being performed on the same direction over the landslide mass and parallel to the landslide body (Fig. 2). As mentioned before, the RES2DINV software was used to interpret the apparent resistivity values of longitudinal profiles, and for a better interpretation, understanding and presentation of the results a common color representation was drawn. The selected color code ranged between dark blue for low resistivity values (0.0 Ωm) and purple for high resistivity values (100 Ωm).

Those three profiles are N-S oriented and have almost the same length of 90-100 m, all ending near the bottom of the Tarsel Valley.

Thereby, data were obtained regarding the structure of the landslide, the water content of the landslide mass, the physical properties of the landslide material, and delineating the potential sliding surface as well.

3. RESULTS AND DISCUSSION

The results of the ERT surveys, obtained from the interpretation of the tomograms are given in Figure 3. An investigation depth of about 15.0 m along all longitudinal profiles was reached, while the length of the profiles ranged between 90 m in 2014 and 100 m during 2007 and 2012. The tomograms show that there is a strong relation between the depth of the rupture surface (max. 2.5 m) and the thickness of the main landslide body. Useful data were obtained after three iterations for 2007 profile with a RMS error of 27.6%, respectively a number of four iterations for 2012 (RMS error of 25.8%) and 2014 (RMS error of 11.6%). The overall resistivity range in the profiles is 0 – 100 Ωm, each section representing distinct features in the landslide site, such as high water content, clay content, undisturbed material or a compact sandstone mass.

The resulting tomograms along these profiles suggests that, along the upper half, all profiles present a section with low resistivity values of 0 - 35 Ωm. High value generally occur in the middle part of the line and are colored in yellow to the nuances of red and purple. This resistivity values ranges from 55- 100 Ωm and usually increase with depth for all cases. There are few zones that have been distinguished during field surveys, namely: recent shallow landslide reactivation, the new and the old landslide body, high water content layers and a compact sandstone mass. The ERT profiles show a shallow (5 m thick) conductive layer, with electrical resistivity values less than 20 Ωm, which covers a more resistive material (> 25 Ωm). The conductive layer could be associated with slide material, a new reactivation of the landslide, and the resistive zone (30 – 35 Ωm) with the old landslide body consisted of more compact and consolidated materials. Low resistivity values are located in the upper part and at the bottom of each ERT profile. Looking at the 2012 ERT profile measurements, the zone of new landslide reactivation core appears wider (40 m long from the origin of the profile) and sometimes deeper than in 2007 profile.

In 2012 profile important results regarding the old and the new sliding surface were obtained. On the 2014 measurements the landslide body and the accumulation zone are clearly visible and present some values ranged between 10-45 Ωm. The thickness of this layer varies between 2-4 m on the profile section. Larger reactivations from 2006 and 2012 could be associated with high amounts of precipitations in the rainy season (Fig. 4).
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Fig. 3. ERT longitudinal profiles through the Buzad landslide
Longitudinal ERT profile made in 2014 shows conductive materials in the upper part and the middle part of the profile and higher resistive material on the second part. This resistivity distribution suggests that the middle of the landslide is characterized by high water content responsible for the new reactivations, hypothesis confirmed by the in-field observations when the ground water table appeared on the surface. The high resistive nucleus from the bottom part of the profile could be related to compact material (sands) embedded in clayey matrix mainly from the old landslide body.

A specific characteristic for all three longitudinal profiles is the undisturbed material or a compact sandstone mass, which during seven year period looks like an obstacle in landslide development.
The electrical tomography images present low resistivity values caused by the high water content of the unconsolidated material of the landslide body, while the higher resistivity values might be an indicator of the consolidated materials, with an important influence on sliding process.

4. CONCLUSIONS

Three field surveys were conducted in the same site of investigation, the Buzad landslide, which was reactivated in 2006. The electrical tomography method allowed performing of 2D images, thereby achieving distribution of the resistivity values to about 15 m depth along the studied landslide. Low resistivity values, which mean conductive material, were associated in this work with slide material that has a high water content. The new and the old sliding surfaces were located in a zone where the resistivity values are changing obviously, aspect noted on all ERT profiles.

The ERT profiles reveals shallow conductive layer with resistivity values less than 20 Ωm, which, in all cases, cover a more resistive material with values exceeding 55 Ωm. All the tomographies have been characterized by the presence of some cores with an increased water content, very conductive, that could have caused the movement of the material and triggering of the slide. On 2012 profile, in the bottom part of the line, it has been recorded a shallow high resistivity zone that may be associated with some intercalations within the disturbed material. The resistivity distribution suggests that the top and the bottom of the slope affected by the slide process are characterized by high water content.

Considering the results obtained, ERT method permit to identify high water content areas that could be responsible for events of reactivation and allow the reconstruction of the landslide body, providing information about the material involved in the movement and its volume. This method also proved to be a method that combine low cost and fast field survey procedures with high resolution imaging of electrical properties of sub-surface.

Electrical resistivity tomography technique showed that Buzad landslide evolution was influenced by the presence of an undisturbed material and that in 2014 this landslide has a more compact mass and there is no possibility of a future reactivation. However, to obtain more information about a landslide evolution and a reliable interpretation of the ERT measurements it is necessary to combine different geophysical methods and to calibrate them with existing geomorphological, geological and geotechnical data.

ACKNOWLEDGEMENT

This work has been supported from the strategic grant POSDRU/159/1.5/S/133391, Project “Doctoral and Post-doctoral programs of excellence for highly qualified human resources training for research in the field of Life sciences, Environment and Earth Science” cofinanced by the European Social Fund within the Sectorial Operational Program Human Resources Development 2007 – 2013”.

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