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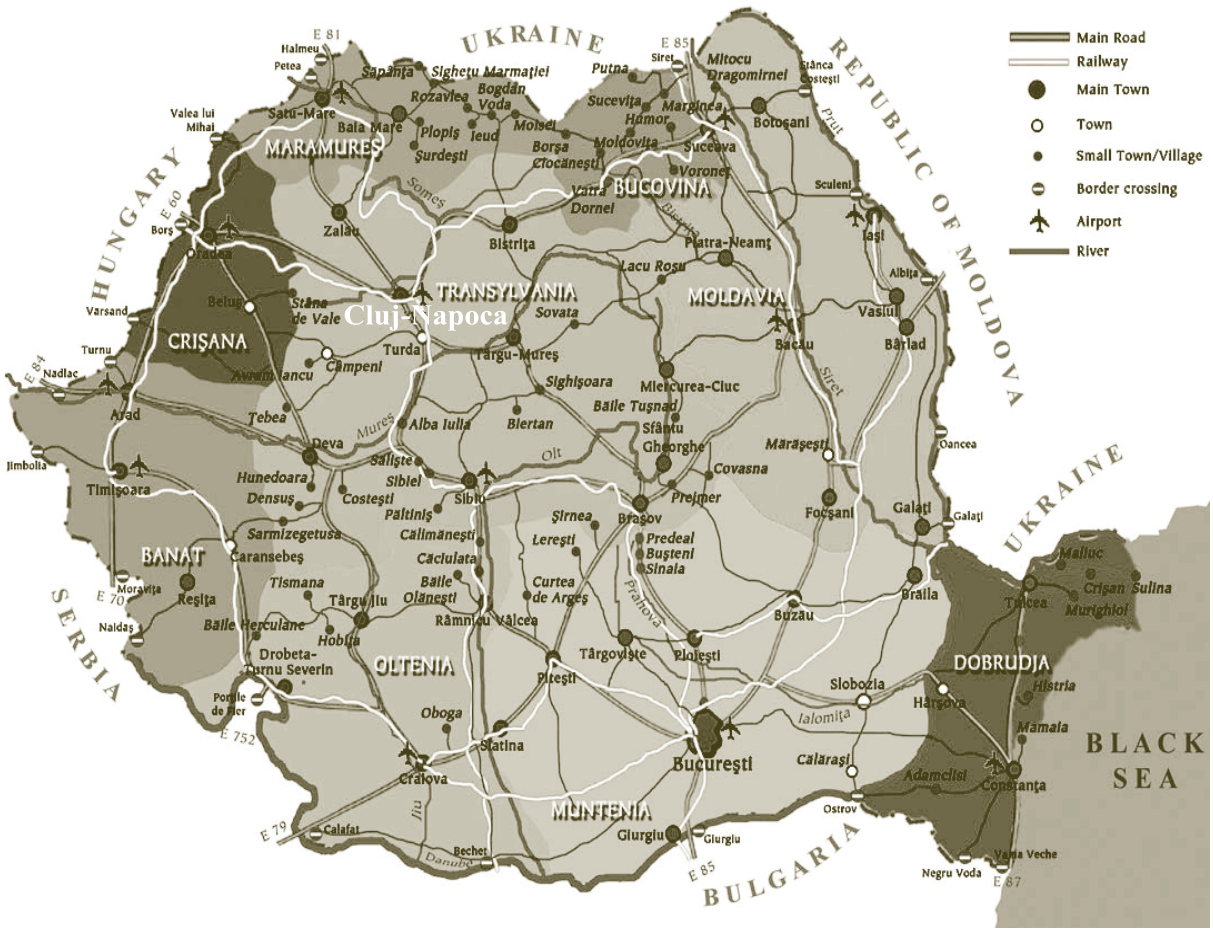

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TYPES OF ALTERATION CRUSTS FROM BIHOR MOUNTAINS

L. I. BUZILĂ[1], O. L. MUNTEAN[2], MARIA DANIELA RAICĂ[2]

ABSTRACT. – Types of Alteration Crusts from Bihor Mountains. Throughout the Bihorului Massif, the petrographic variety has lead to different ways of weathering processes manifestation and has imposed various types of weathered deposits. The products of weathered deposits have various names in scientific literature according to the school that has imposed it. In this paper we used the terms specific to Romanian and French school. Alteration crusts classification had been realized on the basis of field observations and physical and chemical analysis carried out on 12 petrographical categories from where 53 samples of fresh rock and weathered material were collected. Eventually several alteration crusts categories were identified, differentiated by the types of rock on which they were formed.

Keywords: *weathered deposits, alteration crusts, Bihor Mountains.*

1. INTRODUCTION

Large variety of sculpture form and weathered deposits caused the emergence of a specific literature terminology, fact favoured by the different schools tradition that had concerns in this area, and not in the least, by the climate zones in which representatives of these schools have worked.

French School introduced the notion of *altered deposits* (alterite) (Tricart J., 1960; Tricart J. and Cailleux A., 1965). The studies carried out by Campy M. and Macaire J. J. (1989), distinguished three categories: *autochthonous superficial formations* (directly related to bedrock); *par autochthones* (weathered deposits resulted from bedrock but heavily contaminated with materials migrated from the upper part of the slope) *allochthonous* (deposits who have no genetic connection with the rock upon which they were formed).

Studies carried out by representatives of the Russian school (Strakhov N. M., 1967; Seliverstov, 1986) have produced the emergence of terms *hipergenesis* and *hipergenic processes*, as all very complex physical and chemical mutual interactions of the lithosphere, hydrosphere and atmosphere. In 1981 Büdel J., member of German School has developed the concept of *double surface planation*; actually a result of differentiated processes that affect the upper surface of a deposit (mainly affected by fluvial and gravitational processes) and lower surface (where alteration mechanism are dominant).

Anglo-Saxon school have produced a large number of terms to define two important categories of deposits, separated by genetic and positional criteria: superficial deposits that were formed during Quaternary, without connection to the fresh rock underneath, due to transport carried out by external factors; *eluvial deposits* which mean weathered materials remaining on place or near to the place of formation.

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Ollier C. D. (1969), uses the term *saprolite* regarding the upper strongly altered horizon of weathering profile. Velde (1995), in addition, define the saprolite as the upper layer of the weathering deposit, for whose formation the organic material is added in order to form a complex called *pedoplasma*.

Romanian scholars were taken the terms, often arbitrary, from foreign literature. Weathering products are named in different ways: *surficial deposits, alteration crusts, surface deposits, regolith, geoderma*, all of them taking into account the genetic relation of rock and deposits. In this paper we use the terms stated in the Romanian school. The term regolith is defined as weathered deposits that have a direct genetic connection with the fresh rock underneath. (Bland W. and Rolls D., 1998, BirkelandW. P., 1984; Whittow J., 1984). Synonymous with the term *regolith*, *alteration crusts* will be used (according to Ianovici V., Florea N., 1963) and / or weathered deposits and *alterite* (taken from the French school). As regards alterites, distinctions will be made between *autochthonous superficial formations* (the real alteration crusts) and *parautochthonous alterite* (alteration crusts heavily contaminated with material transported from the upper part of the slope).

2. GEOLOGIC AND GEOMORPHOLOGIC SETTINGS OF ALTERATION CRUSTS FROM BIHOR MOUNTAINS

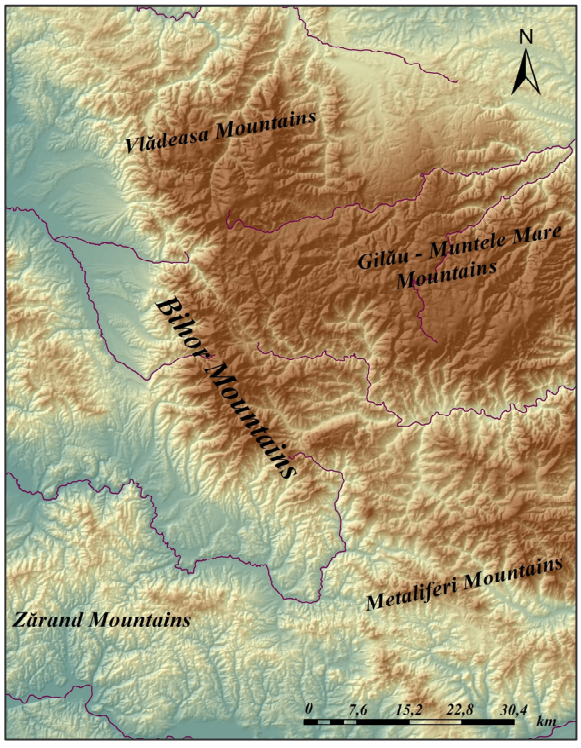

Fig. 1. Geographical setting of the Bihor Mountains.

Bihor Mountains represents the central unit of Apuseni Mountains characterized by the pronounced massiveness and the highest altitude (1849 m at the top of Cucurbăta Mare). The mountainous unit limits are outlined by a series of valleys: the Galbena valley and Crişul Pietros to North, Arieşul Mare valley, Ghizghiţului valley and Draghiţa valley to East, Arieşul Mic and Leuca valleys to South and West, and on a very particular sector, Crişul Negru valley.

Bihor Mountains shows a strong adaptation of the relief to the petrography and structure. From a tectonic point of view, the unit is defined by the presence of the folded systems (the Codru and Biharia folded systems overlapping the Bihor Autochthonous Unit).

Morphologically, the mountainous unit appears as a large horst showing an asymmetry, upright in the East and South part and lowered to the West and North.

This will induce asymmetry in the overall character of the mountain. The relief shows the presence of three *levelled* surfaces: Farcaş surface, the highest, with altitude between 1600-1848 m; Mărişel surface located at 1200-1500 m and Feneş-Deva surface, the lowest, located between 600-800 m. Geotectonic manifestation from Cretaceous period led to the appearance of morphology radical transformation of the Apuseni Mountains and hence of entire Bihorului Massif. The geological factor has an impact on morphology through the following features:

- a complex geotectonique comprising three overlapping units: a lower unit (Bihor Unit) overlapped by Codru's Nappes System and Biharia's Nappes System;
- the presence of two major fault lines affecting these mountains, perpendicular to each other, oriented NE - SW and NW - SE, with vertical movements of blocks leading to a morphological type of horsts and grabens. This feature further influenced hydrographic network layout;
- a great petrographic and mineralogical variety; there are all kinds of rocks here who will behave very differently to the action of weathering processes.

Petrographic variety is expressed in terms of the many types of rocks that make up the substrate. The mountains petrographical composition supports a large number of rocks. These categories have been analyzed using already established classes.

Magmatic rocks are felsic, intermediate and mafic types being represented by isolated occurrence of granodiorite, granodiorite with hornblende, lamprophyre, rhyolite, microgranite rhyolite, rhyodacite, microdiorite andesite and basalt. The main types of minerals contained in these rocks are potassic feldspar, plagioclase feldspar, quartz, biotite, amphiboles, muscovite and hornblende (Sandulescu M., 1984; Mutihac V., 1990; Balintoni I., 1996). Due to the mineralogical variety and thermal conductivity these rocks are the most liable regarding the weathering.

Metamorphic rocks are the widest spread in the area of Biharia Massif. Their physical and chemical properties favour the weathering mechanisms. Most of these rocks are from metamorphic epizone, weakly metamorphosed and mezozone: chlorite schists with porphyroblaste of albite satinate phyllitic chlorite schist, albite schist, sericite phyllite and metaconglomerate, amphibolites, orthoamhibolite and gneiss. To these, sedimentary rocks weakly metamorphosed are added: feldspar sandstones and conglomerates, sandstones and micaceous argillite, laminated conglomerates, sandstones, quartzite. From mineralogical point of view these closely resembles igneous rocks being composed of the same types of minerals.

3. MATERIALS AND METHODS

Weathering deposits were identified and classified on the base of field observations and chemical and physical analysis as well.

The selection of the points where samples of weathered materials were collected took into account several factors: petrographic and structural, topographic and biotic factors. It had been chosen 12 categories and 37 workstation, where from a total of 53 samples of fresh rock and weathered material were collected. Subsequently, they were analyzed following the procedure in the literature (Smith B., McAlister J., 2000).

For samples analysis were used the scientific protocols already imposed in the literature and some weathering techniques developed by members of the School of Geography Research Group, Queens University of Belfast (Northern Ireland).

4. WEATHERING DEPOSITS FROM BIHOR MOUNTAINS

The information achieved as results of physical and chemical analysis carried out on samples collected in the field, allowed us to synthesize several types of alteration crusts particularly for Bihor Mountains. For alteration crusts presentation the most appropriate criterion was the genetic relationship with the substrate. From this point of view, two important classes are highlighted (according to Campy M. and Macaire J. J., 1989): a *autochthons superficial formations*, or "real" alteration crusts, which are directly related to the substrate without having undergone a significant contamination with materials from the upper part of the slope and b. *parautochthones deposits*, or alteration crusts that were contaminated with materials migrated from the upper part of the slope.

4. 1. Autochthons superficial formations

This class includes weathered deposits, which are a direct product of alteration of the fresh rock that it covered. It encompasses the alteration crusts formed on the horizontal and / or low inclined interfluves and on the remnants of the three denudation surfaces. Preserving the characteristics of each petrographical unit they can develop on all rocks categories. On the base of their complexity it can be distinguish: *polyphasic alteration crusts* and *monophasic alteration crusts.*

4. 1. 1. Polyphasic alteration crusts

The materials that make up these crusts are partly an expression of actual environmental factors and partly the legacy of past periods. They have been developed during long periods, with climate changes that have led to changes in geochemical condition. Each new change in geochemical conditions imposed new weathering mechanisms, reflected in the structure and mineralogy of materials from weathered profiles (Battle Queney Yvonne, 1996, Nahon D. B., 1991).

Two types can be noticed: *alteration crust with double front of weathering (A) and alteration crusts with a single front of weathering (B).*

A. Alteration crust with double front of weathering (fig. 2) spreads over certain areas on the denudation surface Fărcaşa. We believe this type of alteration as the oldest in Bihor Mountains because assembles an old horizon, a gelifraction products horizon, inherited from Pleistocene period, having a thickness sometimes up to 2.5 m (on south part of Cucurbăta Mare peak) and a younger horizon, formed in the period Holocene-actual, with a significant percentage of organic matter.

Overlapping of these horizons gave rise to two weathering fronts; the first one, located at the interface gelifraction products - fresh rock, the other, located at the soil base at the contact to gelifraction products horizon. Differentiation between the two fronts can be noticed regarding the alteration mechanisms as well. The lower front, f1, having a thickness of 5 to 10 cm, advances by means of silicates hydrolysis processes and form a fine fraction with a phyllosilicate phase, dominated by the presence of kaolinite. Upper front, f2, has a diffuse character, without a clear limit between them, operating mainly through the mechanism of oxidation.

The appearance of the two fronts was possible due to the existence of Pleistocene gelifraction products horizon. This acted as a "protective membrane", a barrier for direct influence between climatic factors and subjacent bedrock. Permeability in turn, allowed water to reach the bottom of the horizon and to attack, by specific processes of hydrolysis, the fresh rock. Through time, a thin horizon consists of altered material was created. At the upper part, appearance of the soil layer has also created conditions for occurrence of a new weathering front where oxidation processes are dominant.

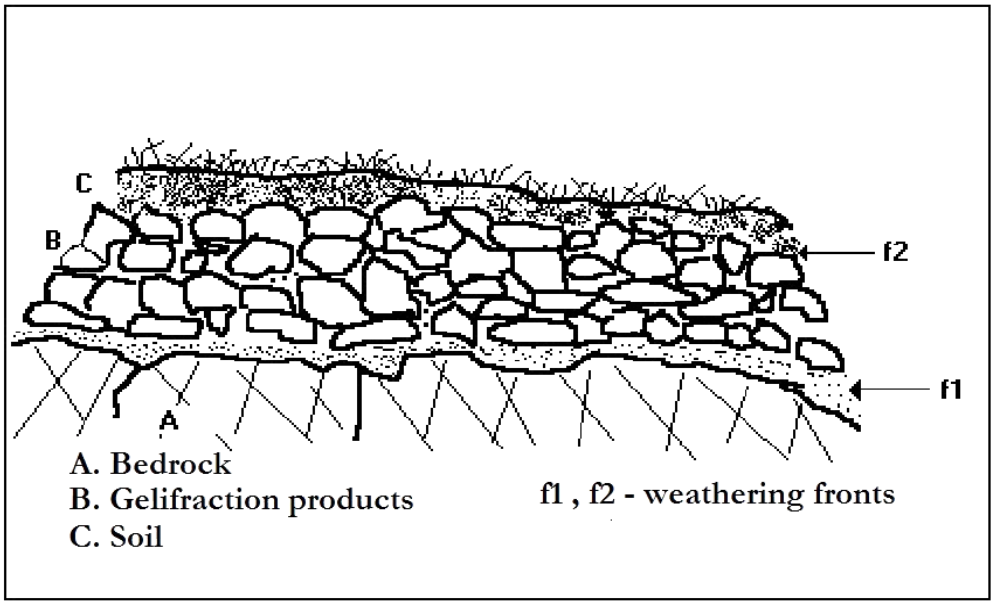

Fig. 2. Alteration crust with double front of weathering.

B. Alteration crusts with a single front of weathering. This type characterizes low interfluves and the "remnants" of Fărcaşa (lower level), Mărişel and Feneş-Deva denudation surfaces. From dimensional point of view they show a great variation in thickness. Measurements present values of 30 to 50 cm. on the narrow interfluve that surround Piatra Graitoare peak and between Tău Mare and Zănoaga peaks. On the low interfluve of Feneş-Deva denudation surface (e.g. interfluve between Ghizghiț and Bucura valleys within Arieşului Mare hydrographic basin, or interfluve between Crişul Negru and Crişul Băiței) the values range from 2 to 2.5 m. These are alteration crusts with materials that have an initial and intermediate weathering index (a fact attested by clay fraction). We estimate that their issuance began after the Tardiglacial period.

4. 1. 2. Monophasic alteration crusts. These are the expressions of a single phase of evolution, carried out under the same climatic conditions. Based on their physical and chemical characteristics we assume that these alteration crusts have a younger age than previous type, being the result of environmental condition manifested in the current period. From dimensional point of view, thickness values are reduced from 5 to 15 cm; but from

genetic points of view we can say that they are the most "pure", not at all contaminated by outside elements. Monophasic alteration crusts in turn, have distinct characteristics depending on the type of rock on which they were formed.

A. Carbonate alteration crusts (Fig. 3), are formed by an "epidermal" alteration process of the limestone buttes, that are not subject to direct water scour that is a main condition of their accumulation. Encrustments occur as a result of this alteration process and are highly widespread, frequently encountered on the limestone walls of Sighiştelului, Galbena, Crăiasa valleys and in the upper part of Crişului Băiţei basin below the Black Stones.

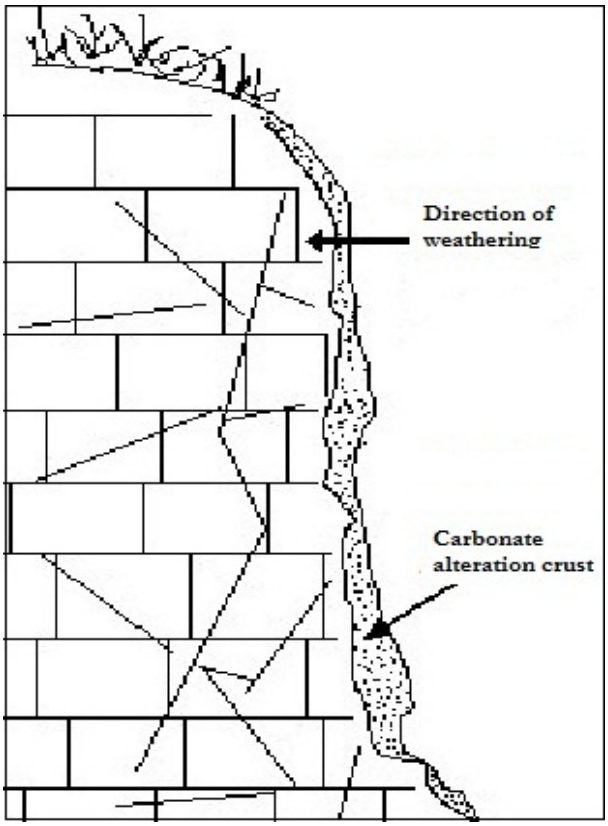

Fig. 3. Carbonate alteration crusts.

Dimensional, carbonate crusts have reduced thickness, approximately 10-15 cm; for their formation, alteration process worked from the surface to the inside of the rock. The material has a mixed structure; coarse fraction is mixed intimately with the fine.

Chemical analysis of these crusts reveals, as are naturally, a very high percentage of CaO, which proves the genetic link with fresh rock underneath. Taking into account physical and chemical characteristics we consider these crusts as very young, the result of the processes that are ongoing today.

Another situation is that of alteration crusts developed on basalt. Within Bihorului Massif area there are few occurrences of insularity basalt rocks.

The most expressive, with an important role in landscape morphology, are basalts intruded within the white reefs and grey Jurassic limestone. Basalts susceptibility to alteration allowed the development of small 5 to 10 cm thick alteration crusts; the dominant process here is spheroidal weathering. The granulometry placed the materials within grains structures range and texture is clayey-sandy, reflecting an incipient weathering.

The diffractometer analysis reveals an interesting chemical composition. Within the alteration crust a highly concentration of medium soluble salts were noticed, which is contrary to the climate characteristics here. Furthermore, the diffractogram analysis revealed the presence of clay minerals from smectite group (montmorilonite) which normally appears on a substrate in a warmer alkaline and relatively dry climate (<500 mm). In this case, however, the basalts have the dominant role releasing by weathering, the elements accumulate in the crusts.

Based on dimensional, textural and chemical information, we believe that weathering crusts formed on granodiorite have evolved from Tardiglaciar to present, while the crusts formed on basalt are much newer, even contemporary. Basalts analyzed outcrops were opened about 60 years ago, with upgrading of the road over Biharia, between the villages Ştei and Arieşeni. We have in this case information regarding weathering index ratio for alteration crusts, knowing the exact age.

B. Epidermal weathering crusts developed on Permian quartzite sandstone. This type shows similarities with epidermal alteration developed on other types of rocks. Alteration crusts here have a reduced thickness, about 5 cm. due to the intense process of slopes' washing away. Within the alteration crust the chemical analysis and diffractogram reveals a dominancy of the quartz mineral.

4. 2. Parautochthones alterite

Results obtained from physical and chemical analysis of the samples, revealed that the vast majority of parautochthones weathering crusts suffered in a greater or lesser extent contamination with elements migrated from the upper part of the slopes.

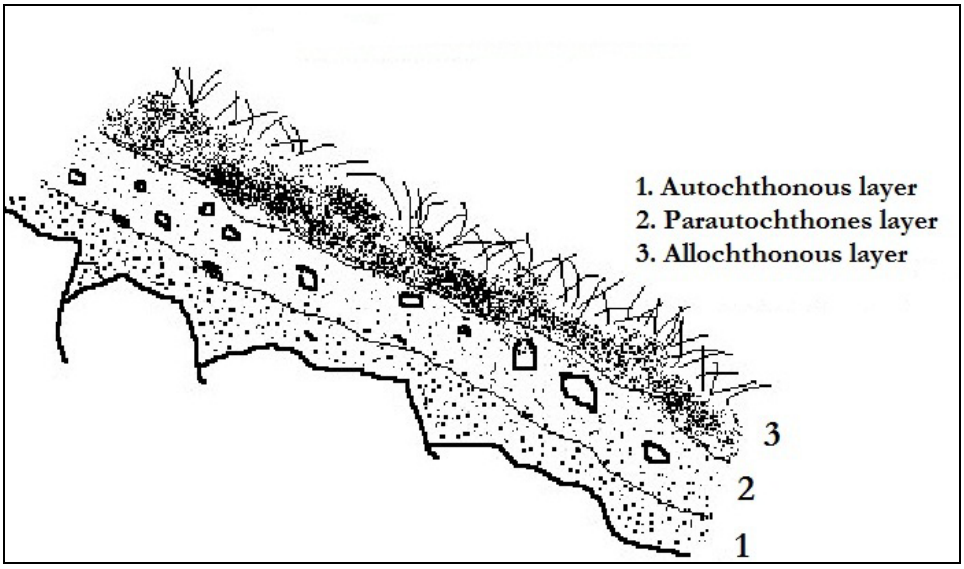

Fig. 4. Parautochtones alterite.

As a result, within the weathered profile, it can be distinguished three distinct levels identified on the relationship to the substrate criterion: *autochthonous* (true weathering crusts) in the profile, *parautochthones,* the horizon heavily contaminated from above and allochthonous, the upper horizon consisting entirely of material moved gravitational on the slope (Fig. 4). This is the case most frequent in this mountain area.

We have therefore, the image of a complex tripartite deposit, where the transition from one horizon to another is realised gradually, to draw a separation line being very difficult. For the description of these alteration crusts, the best criterion is the petrographic one.

4. 2. 1. Weathering crusts formed on carbonate rocks (limestone and similar rocks) are generated by intense decarbonation processes. *These are loamy decarbonisation crusts* (according to Campy M. and Macaire J. J., 1989).

Loamy sandy carbonation weathering crusts are formed as a result of an intense carbonates leaching due to the water loaded with CO_2, NO_3, and organic acids. Consequently, a weathering crust composed of insoluble residue content within limestone (silicates, oxides), secondary minerals and allochthonous detrital fraction, is formed.

These materials can be dominant sandy or clayey depending of the insoluble fraction contained within limestone. The crust lay on limestone surfaces that have reduce slope value ($<15^0$) and / or horizontal interfluves.

Also deposits of this type can clog dolinas and other lowland areas in the karstic zones. The thickness of weathering deposits may reach 2 to 2.5 m. From structural point of view these deposits contains a mixture of fractions, fine, medium and coarse in relatively equal percentages. If the fine and medium fractions are a result of decarbonation, coarse fraction has an allochthonous origin. There is a chemical change in the percentage of CaO; on the same substrate in the field were found situations where CaO values were high and situations where they were low. This shows an intense leaching of slightly soluble salts that the deposit was submitted. In this case we are dealing with the carbonate siallitic and clayey siallitic type deposits (according to Ianovici, Florea, 1963) these subtypes reflecting not a climate conditioning but rather an interaction of petrography, climate and topography.

4. 2. 2. Weathering crusts developed on igneous rocks (banatite granodiorite)

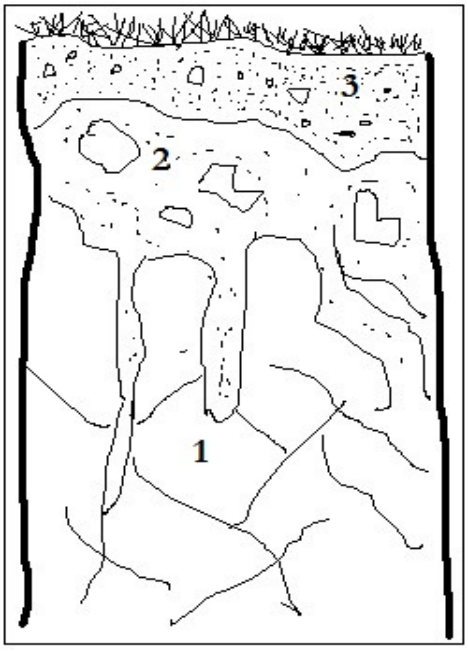

Fig. 5. Weathering profile on igneous rock.

Within Bihorului Mountains, these rocks occupy relatively reduced areas comparing to the crystalline rocks that have intruded. Insularly, granodiorite as intrusions, are emerging in many points but without relevant effects in morphology.

The areas where a particular morphology has developed are overlapping basalt massive intrusion on Cepelor Valley, on the Crişului Pietros Valley and in south, on the left slope of Arieşului Valley.

Susceptibility to weathering processes of banatitic magmatic rocks allowed the formation of well developed alteration crusts measuring from 1 to 2 m, and structure specific of weathered deposits; the sequence of horizons saprock (1), saprolit (2), and soil (3) is well preserved. From the structure point of view the weathered materials are occur as grain and in terms of texture they range with category of coarse sandy deposits. Chemical has an average index of alteration, with a high frequency of primary minerals: quartz, muscovite,

feldspar and amphibole. The degree of alteration is given by the existence of clay minerals such as kaolinite / vermiculite which show a debut of weathering and intensive washing process of easily soluble salts, which is facilitated by high permeability of weathered deposits.

***4. 2. 3. Weathering crusts formed on metamorphic rocks*,** crystalline schist (chlorite schist with albite and epidote, phyllites satinate chlorite schist, albite schists, sericite phyllites) metaconglomerate, metamorphosed sandstones and clays, have common features regarding the types of generated weathering crusts. Differences in thickness of deposits are introduced mainly by topographic factor that will determine an intense washing of deposit's materials on steep slopes.

The depth of weathering front range from 2 to 2.5 m, even on inclined surfaces. Analyzed profiles showed well expressed weathering crusts where the materials are in an early stage of weathering mainly due to hydrolysis and oxidation mechanisms. The presence of clay minerals provides information regarding both, the type and intensity of alteration process. The weathering indexes intensity assessment for various samples from workstation has provided additional data about weathering of materials that compose the deposits.

5. CONCLUSIONS

Great petrographic variety, physical and chemical characteristics of rocks and minerals, specific climate and morphology of the Bihor Mountains, imposed the emergence of various types of weathering deposits. They are in direct connection with the substrate where derived from or they undergone transformation (contamination) of materials and weathering profiles dictated by morphological factor.

Although igneous rocks occupy a reduced surface within studied area, their mineralogical characteristics allowed the formation of the most well developed alteration crusts. We have noticed here a strong physical and chemical diversity of weathered crusts, even on the same categories of rocks, diversity dictated by morphological factor.

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STUDIA UBB GEOGRAPHIA, LVII, 1, 2012, pp. 15-22

STATISTICAL LANDSLIDE HAZARD ANALYSIS IN SOLCA CATCHMENT AREA

IOANA SIMEA[1], SANDU TODICA[1]

ABSTRACT. – Statistical Landslide Hazard Analysis in Solca Catchment Area. This paper proposes the use of a Geographical Information Systems (GIS) database in order to describe the statistical relations of landslide frequency and physical parameters, which contribute to the initiation of landslides on Solca catchment. This GIS database is used to obtain a susceptibility model for predicting slope instability. Here an inventory map of 29 landslides was used to produce a dependent variable. Slope angle, fragmentation depth, drainage density, slope curvature, slope aspect, land use and elevation were taken as independent variables. The effect of each parameter on landslide occurrence was assessed from the corresponding coefficient that is calculated by Landslide Index Method (LIM). Using a predicted map of probability, the study area was classified into six categories of slope susceptibility. The high susceptibility zones make up 6.7% of the total study area and involve mid-altitude slopes in the central part of Solca catchment.

Keywords: *susceptibility, GIS, landslide, catchment, LIM.*

1. INTRODUCTION

The strategies used in analysing the landslides are extremely useful in understanding the process and crucial for predicting the appearance of new landslides so as to reduce the damages they cause.

Generally speaking, the methods used for delimiting the areas with different degrees of susceptibility for landslide occurrence can be classified in two classes: qualitative and quantitative methods. The qualitative methods are based on the knowledge and experience of the expert who chooses the selection, the classification and the combination of variables taken into consideration. The quantitative methods still need mathematical and statistical operations in order to emphasize the relations established between the variables. The majority of the researchers admit the superiority of the quantitative methods due to the existence of rigorous studies that promote objectivity. Nevertheless, a quantitative model is considered to be more reliable than a qualitative one only when it accomplishes two specific conditions: validity and accuracy. Most of the models are based on the idea that the landslides will generally occur under the same conditions and are generated by the same factors that caused them in the past – this being a consequence of the uniformitarianism principle. Like in the case of any other method, we rely here on the presumption that there is a statistical relation between the old landslides and the various factors that influence slope stability (spatial data representing geology, slope, morphology, vegetation, etc.)

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2. STUDY AREA

The studied area, more exactly the hydrographic basin of Solca River, is situated in the North-East part of the country, at the contact area between Obcinele Bucovinei and Suceava Tableland. In this area we can distinguish two sectors: a mountain one, which drains the Eastern slope of the Obcina Mare, which was formed as a consequence of the Paleocene break-thrust strata (grindstones, agglutinations), and a hilly-piedmont one, carved in Sarmatian deposits, consisting of an alternation of clay, sand clay, sand and gravel, in which several layers of grindstone and oolithic limestone are present, with an addition of quaternary Pleistocene deposits (sand and gravel). The morphology of this territory reflects, to a great extent, the geology of the zone (the lithologic and tectonic composition).

As far as the climate is regarded, this hilly area is included in the Eastern European temperate climate, which is characterized by transitional features from oceanic and sub-Baltic humid nuances to excessive ones, to which we can add the phenomenon of foehnisation of air masses descending from the Eastern slopes of the Oriental Carpathians, in our case from Obcinele Bucovinei. The analysis of temperature variations registered in between 1955-2002 at the Rădăuți meteorological station emphasizes a multi-annual average value of 7,4 ºC but, taking into consideration the altitude, variations of up to 4,2 – 5,5 ºC can be noticed in the mountain area. The annual average amplitude is of 22 ºC. The annual average precipitation values registered at Solca pluviometer station between 1896-2004 show a decrease from West towards East, from 712,7 mm in the mountain area to 536,6 mm in the Eastern extremity of the basin as indexed at Pârhăuți, between 1896-2004.

3. METHODOLOGY

In this study were taken into consideration seven factors which could influence the landslides occurrence: slope angle, fragmentation depth, fragmentation density, slope curvature, slope aspect, land use and elevation. Each of these factors was subdivided into different classes according to value or feature. An important factor like lithology was not taken into consideration in this case due to the fact that its homogenous distribution in the studied area makes it irrelevant for the study case we observed.

The method we used in this study is called the Landslide index method. For each parameter class, such as a land use or a slope class, a weight-value is calculated as the natural logarithm of the landslide density in the class divided by the landslide density in the entire map. This ensures that weight values will be negative when the landslide density is lower than normal and positive when it is higher than normal. The method is based upon the following formula

$$\ln Wi = \ln(Densclas/Densmap) = (A(Si)/A(Ni)) / (\sum A(Si)/\sum A(Ni)), \text{ where:}$$

Wi = the weight given to a certain parameter class (e.g. land use type or a slope class); Densclas = the landslide density within the parameter class; Densmap = the landslide density within the entire map; *A(Si)* = area of landslides, in a certain parameter class; *A(Ni)* = area of a certain parameter class.

The first thing we did in this study was to settle a spatial database for the landslides which is composed, in this case, of two sides: one that contains all the landslides indexed and one that contains all factors causing the phenomenon. Having an inventory of all the landslides is crucial for the GIS analysis. The inventory was created by using a Magellan GPS with a field precision of 1 m. Hence, there have been delineated 29 different new types of landslides, be them superficial, layered or lined.

4. LANDSLIDE-RELATED FACTORS

The slope angle is considered to be an important parameter for the evolution of slope geomorphologic processes. The Paleo-geomorphologic evolution of the Marginea-Ciungi piedmont has formed slopes of various inclinations and different profiles. Generally speaking, slope angles having less that 2 ºC (quasi-horizontal or slightly bent) are considered to be slope inclination limits where fluvial accumulation is predomi-nant. These slight inclinations of the slopes, represent 24,6% of the basin surface, being characteristic especially for the inter-fluvial lines, the Solca depression and the main valleys of Solca, Clit and Iaslovăț rivers. The predominant geomorphologic processes encountered here are pluvio-denundation and superficial erosion.

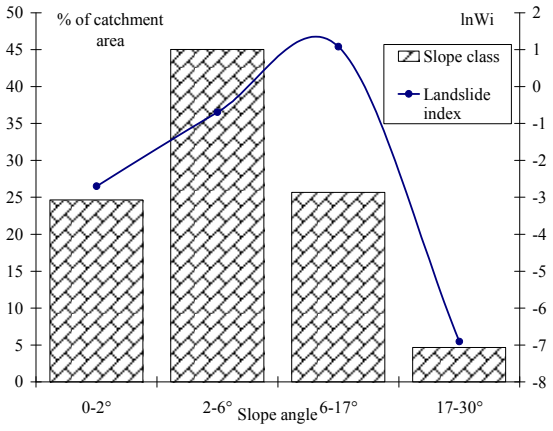

Fig. 1. Landslide Index for slope angle.

Slight erosion processes and coluvio-proluvial-deluvial accumulations are encountered starting from slopes of 2-6º class, which are characteristic to the contact area between valley and slope and the inter-fluvial line. With its percentage of 45% coverage this class of slopes is quite representative for this area.

Slopes with a gradient of 6-17º, representing 25,7% of the studied surface, are characterized by landslides and gully processes which become more intense as the vegetation gradually rarefies. Slopes with a gradient higher than 17º eventually representing a percentage of 4,7% in the area, appear mostly at the mountain contact, on the cuestical fronts and where the slopes were fragmented by the hydrographic network. The highest value calculated using the Landslide Index Method for all the four categories was of 1,08 and corresponds to the class of values in between 6-17º, representing 75% of the landslide occurrences.

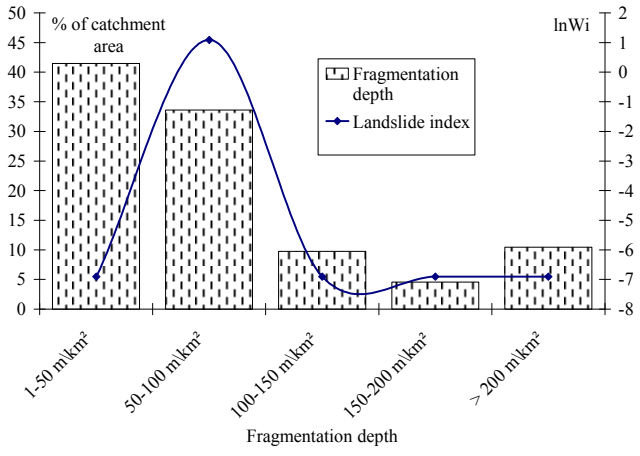

Fig. 2. Landslide Index for fragmentation depth.

The fragmentation depth is highly connected to all valley ages, to the intensity of neo-tectonic cresting, to

lithology and to hydro-climatic conditions differentiated on relief distribution. We can generally admit that values decrease from West to East according to the inclination of the layers.

The values vary between 0,1 – 228,7 m/km², almost half of the area being characterized by values between 0,1 – 50 m/km². Energies of relief measured at the inter-fluvial line between Soloneț, Solca, and Sucevița show values between 50-100 m/km² and those higher than 100 m/km², are recorded at the contact with the mountain area. All the landslide occurrences manifest in this class.

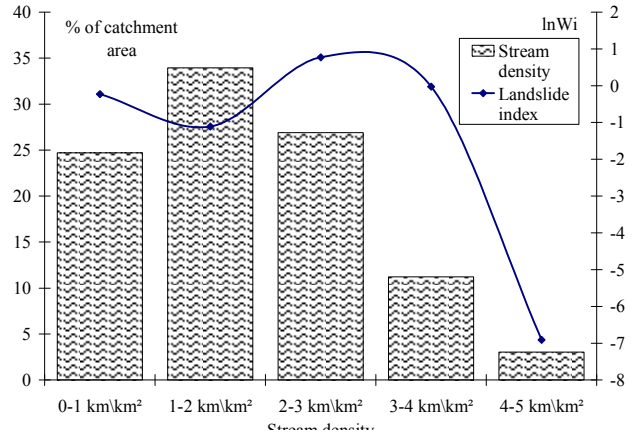

Fig. 3. Landslide Index for stream density.

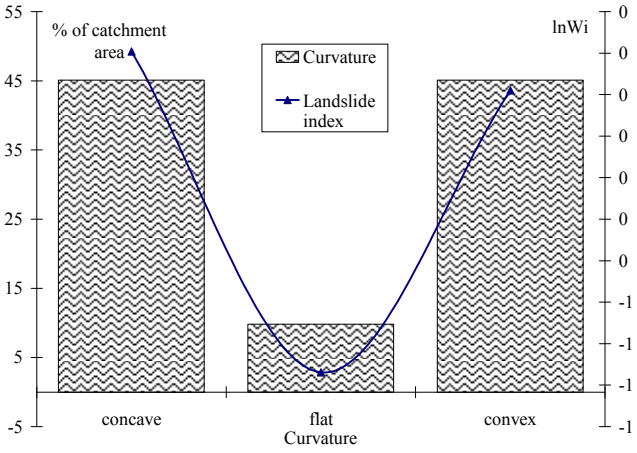

Fig. 4. Landslide Index for slope curvature.

Drainage density is also an important factor in what the growing of the morpho-dynamic potential of the Solca's basin is concerned, being influenced by the layout of stream network and the geomorphologic evolution of the area.

The horizontal fragmentation of the relief has relatively high values that vary between 0.1 – 4.9 km\km², while 85,8% of the area is characterized by values between 0-3 km\km² and the highest values are recorded near the contact with the mountain area. Due to the fact that 58,3% of the landslide occurrences were here recorded, the zone appears to have the highest index 0,77 as well, calculated where the highest densities, of 2-3 km\km² were encountered.

Regarding the slope curvature, both concave and convex slopes have a positive value in the landslide index. Nevertheless the concave ones show higher values in what the certitude factor is concerned. As a consequence of raining, concave slopes retain more water and for a longer period this fact could lead to a balance break. About 50% of the landslides surface is encountered on the concave slopes.

The aspect refers to the different exposure to light and heat of each part of the slope. For example the South part gets a higher caloric and luminosity exposure than the North-oriented one, fact that determines a sudden melt of snow. In the summer, the South slopes get warm and lose humidity quicker; they usually benefit from a smaller water reserve. The shaded slopes have a lower surface temperature and a higher humidity being more predisposed to landslide occurrence. The West and North-West oriented slopes, register the highest values of landslide occurrence, the percentage being up to 53,3%.

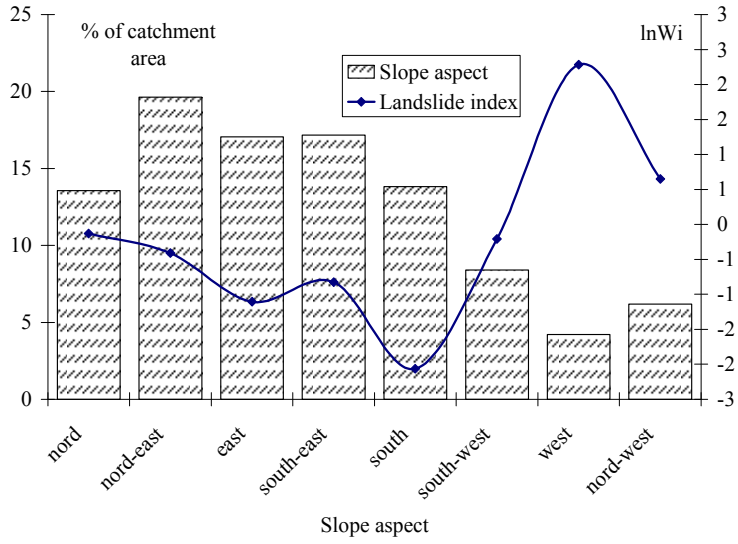

Fig. 5. Landslide Index for slope aspect.

The investigations conducted so far, concluded that the vegetation layer, mostly forests, helps to stabilize the soil. The highest values of the landslide index are recorded on the slopes where pastures are found and also in the transitional woodland shrub areas which are the result of massive deforestation. Normally, the *elevation* is not considered to be an important parameter in what the landslides distribution is concerned.

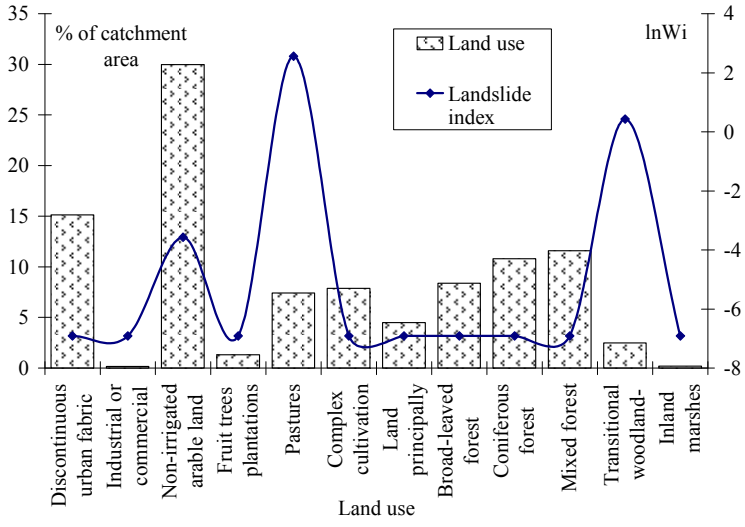

Fig. 6. Landslide Index for land use.

In the Solca basin, at an altitude between 400-500 m, a series of fluvial-deltaic deposits of poorly petrified sand and gravel were discovered (Martiniuc C., 1948, Ionesi L. and Ionesi Bica, 1971).

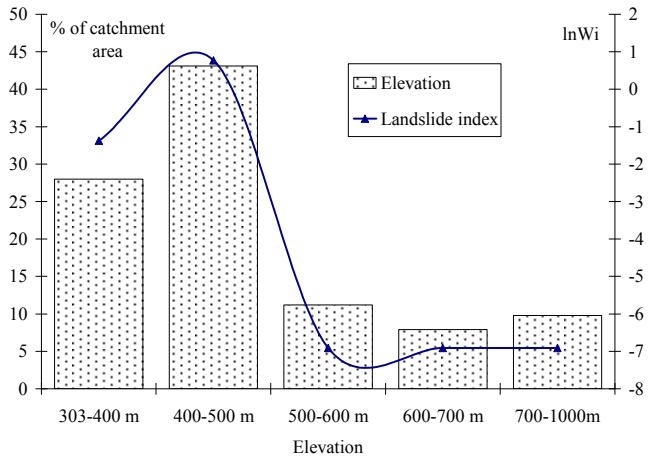

Fig. 7. Landslide Index for elevation.

These are characteristic for the upper part of the piedmont hills, covering the neritic deposits (clay, clayed-sand, shale). In conclusion, at this altitude there are favorable conditions for landslide occurrences. Furthermore all landslides were encountered at this specific altitude.

5. CONCLUSIONS

After integrating in GIS all the resulted data, by using the landslide index method, we were able to generate the map of land susceptibility regarding landslides. In order to obtain relevant results, the values were divided into 6 classes of susceptibility.

Classes of susceptibility for Solca catchment

Table 1

Susceptibility class	Area(ha)	% of catchment area	Landslides area (ha)	% of total landslides area
High stability	984.5	5.9	0	0.0
Medium stability	3389.7	20.2	0	0.0
Low stability	4254.0	25.4	0	0.0
Low instability	3364.6	20.1	0	0.0
Medium instability	3626.6	21.7	1.05	2.5
High instability	1120.2	6.7	40.54	97.5
Total	**16739.9**	**100.0**	**41.59**	**100.0**

We can assert that 6.7% of the studied area is characterized by high slope instability in what landslides are concerned. The specific areas of interest: Iaslovăț basin, Soloneț-Solca interfluve, Lupului Hill, located near Poieni Solca locality, and areas found at the contact with the mountain.

All remaining surfaces are quite stable, being sometimes subject to different risk factors (i.e. Poieni Solca area, where deforestation of some surfaces lead to slope instability).

The landslide susceptibility analysis results were validated using known landslide locations. Validation was performed by comparing the known landslide location data with the landslide susceptibility map. In our case, the class with highest susceptibility could explain 97.5 of all the landslides. This means that we have a valid model.

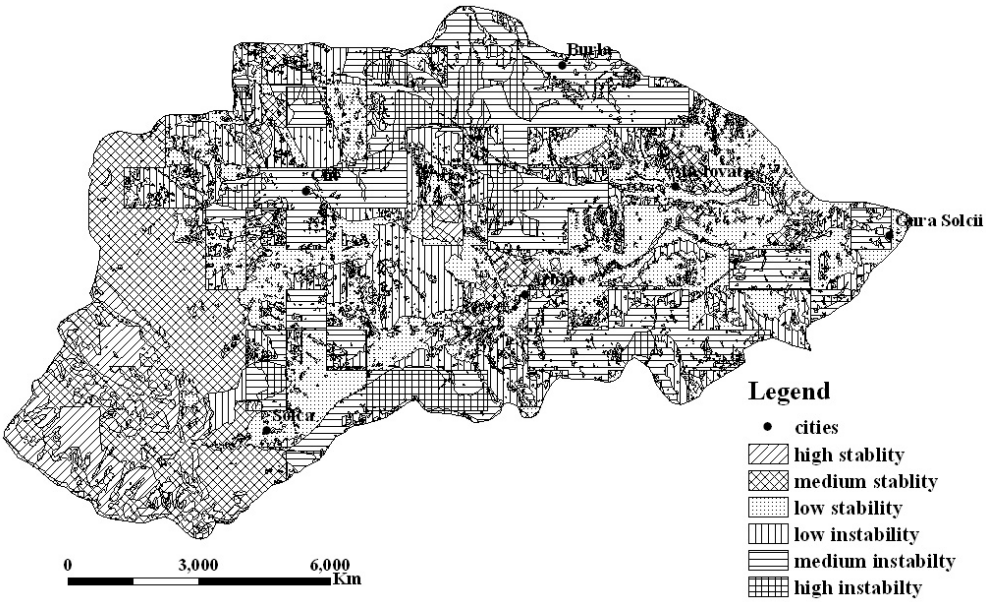

Fig. 8. Landslide Susceptibility map for Solca catchment.

Losses resulting from landslides can only be reduced in one of two ways: either by modifying the hazard event itself or by reducing human vulnerability to it. Both philosophies require the natural hazard to be zoned (Chang-Jo F. Chung, 1994).

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EVOLUTION OF GLOBAL SOLAR RADIATION TRENDS AT CLUJ-NAPOCA (ROMANIA) FOR THE PERIOD 1921 TO 2009

S. V. TAHÂŞ[1], L. MUNTEAN[1], G. ROŞIAN[1]

ABSTRACT. – Evolution of global solar radiation trends at Cluj-Napoca (Romania) for the period 1921 to 2009. Trends of the annual and seasonal mean global solar radiation were detected at Cluj-Napoca station (Romania) during the period from 1921 to 2009. The long-term evolution of global solar radiation has been evaluated by Mann–Kendall and *t*-tests. We also used in this analysis the linear trend. The analysis revealed significant increase in annual and most seasonal global solar radiation. This increase in global solar radiation (GSR) is more pronounced during the winter and spring seasons, and can be attributed to solar variations and cloud cover. The results of Runs test, based on the number of runs above and below the mean, did not clearly detect a trend (except April) or an oscillation, because all the p-values obtained are below α-level (0.05).

Keywords: *Angström–Prescott equation; global solar radiation trends; Mann–Kendall test; Student's t-test; Runs Test.*

1. INTRODUCTION

Solar radiation received by the Earth is the primary source of energy that drives the climate system. Natural and anthropogenic change in the amount of insolation, therefore, has important implications for climate change studies as well as agriculture, water resources, and solar energy applications.

It is known that solar radiation received at the earth's surface is conditioned by the radiation received at the top of the atmosphere and by absorption and scattering due to clouds, aerosols, and gases including carbon dioxide, ozone, water vapor, oxygen, and nitrogen dioxide. Any significant and widespread change in solar radiation (R_s) is, therefore, likely to be of major importance for agricultural production as well as for climate change and the direct exploitation of solar energy (G. Stanhill and S. Cohen, 2001). According to H. C. Power (2003), aerosols affect the radiation budget indirectly by altering the formation and precipitation efficiency of clouds. Radiative forcing of climate by aerosols is thought to be comparable in magnitude, but opposite in sign, to that of greenhouse gases (IPCC, 2001).

Unfortunately, solar radiation measurements are not easily available for many developing countries for not being able to afford the measurement equipment and techniques involved. Global solar radiation is measured only at a limited number of sites in the world, while sunshine duration is measured in many stations. Therefore, it has been the most widely available factor for solar radiation estimations (Z. Şen, 2001). So, where no radiation measurements exist, using global solar radiation estimations calculated from sunshine duration data is recommended. Furthermore, it is known that sunshine duration measurement is easier than global radiation measurement. It is, therefore, likely that the accuracy of sunshine duration measurement is higher than that of global solar radiation (M. Yorukoglu and A. N. Celik, 2005).

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Solar radiation is infrequently measured at most engineering sites because it requires sensitive solar radiation sensors which are difficult to maintain (e.g. frequent de-dusting). Many researchers have used different techniques for its estimation, e.g. M. G. Iziomon and H. Mayer (2002) categorized the solar radiation models as cloud based and sunshine based models. A. Hammer et al. (2003) used the HELIOSTAT method to derive surface solar irradiance from satellite images while H. M. Kandirmaz et al. (2004) used the Metoestat Wefax type visible image (C3D) data for the solar radiation mapping of Turkey. Z. Samani et al. (2007) derived a procedure for the estimation of the daily net radiation using canopy temperature, albedo, short wave radiation and air temperature whereas J. Polo et al. (2006) recommended a new filtering technique for solar radiation ground data by generating models for solar irradiance estimation using geostationary satellite data.

2. LOCATION OF THE STUDY AREA

Cluj-Napoca, belonging to Cluj County of Romania, is located in the central part of Transylvania (North-West of Romania), in a region surrounded by hills, more exactly in the valley of the Someşul Mic River (fig. 1). It lies at the confluence of the Apuseni Mountains, the Someş plateau and the Transylvanian plain.

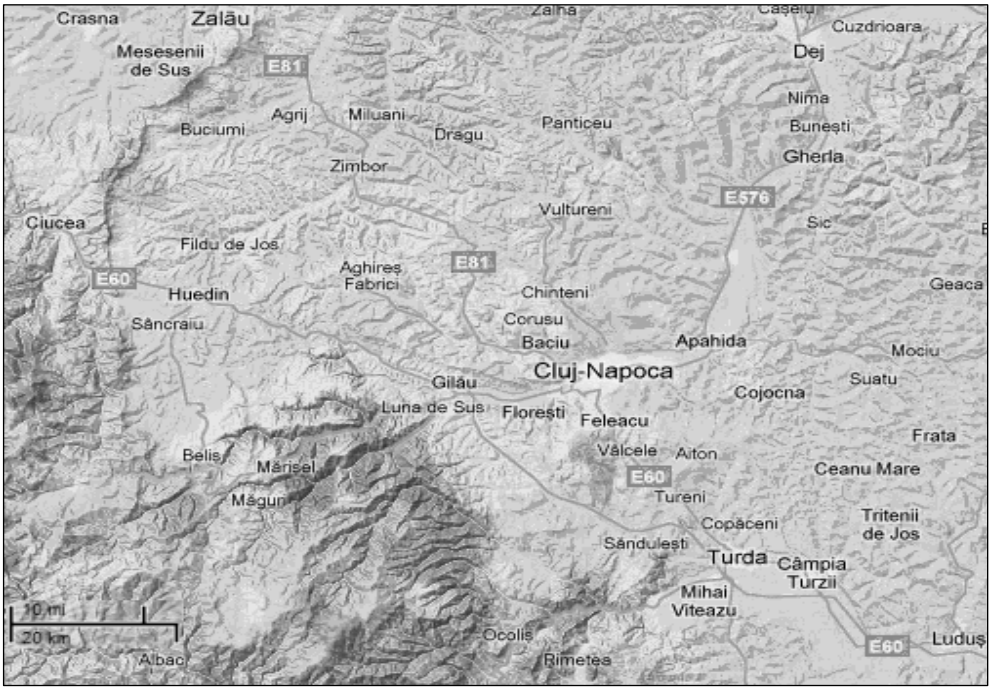

Fig. 1. Location of the study area (Cluj-Napoca).

The city has a continental climate, characterized by warm dry summers and sometimes cold winters. The climate is influenced by the city's proximity to the Apuseni Mountains, as well as by urbanization. Some West-Atlantic influences are present during winter and

autumn. The greatest value of global solar radiation is recorded in summer season, while winter has the lowest value. The meteorological station in Cluj-Napoca is located at about 46°47'N/23°34'E and height about 414 m above sea level.

3. DATA AND METHODS

The global solar radiation (GSR) data were calculated from the monthly sunshine hours using the Angstrom-Prescott equation, and were taken from the Meteorological Yearbooks (MY) and Monthly Climatic Data for the World (MCDW). The analysis was made on a long-term, more exactly for an 89-year period (1921–2009).

Seasons were defined using the standard meteorological definition. Therefore, December, January and February represent the winter season. Note that while computing the mean for winter season, December of the previous year is included. March, April and May represent the spring season; June, July and August is the summer season; September, October and November is the autumn season.

If the global solar radiation (R_s) is not measured with pyranometers, it is usually estimated from sunshine hours and it can be calculated with the Angstrom-Prescott formula (J. A. Martinez-Lazono et al., 1984; C. Gueymard, 1995):

$$R_s = \left[a + b\left(n/N\right)\right] \times R_a ,$$

where R_s and R_a are the global solar radiation (MJ m^{-1} day^{-1}) and extraterrestrial radiation (MJ m^{-2} day^{-1}), respectively, on a horizontal surface; n is the actual number of monthly sunshine hours (h) and N is the maximum possible number of monthly sunshine hours (h); n/N is relative sunshine duration; a gives the fraction of R_a reaching the Earth on cloud-covered days when n = 0, b is the coefficient of regression; (a + b) represents the fraction of R_a reaching the Earth on clear-sky days, when n = N.

Studies on the a and b coefficients of Angstrom's formula have previously been published by D. G. Baker and D. A. Haines (1969) and A. G. Panoras and I. G. Mavroudis (1994). Variations in the a and b values are explained as a consequence of local and seasonal changes in the type and thickness of cloud cover, the effects of snow covered surfaces, the concentrations of pollutants and latitude (E. Linacre, 1992; J. B. Boisvert, 1990). Based on measurements made at various locations on the Earth, R. G. Allen et al. (1998) recommended the values of a = 0.25 and b = 0.50 (which will be used in this study) in estimating R_s, when there is available data on sunshine duration and direct measurements on R_s are missing.

The extraterrestrial radiation (R_a) and the monthly maximum possible sunshine duration (N) are given by (R. G. Allen et al., 1998):

$$R_a = \left[\left(24 \times 60\right)/\pi\right] \times G_{sc} \times d_r \times \left[\omega_s \sin\left(\varphi\right)\sin\left(\delta\right) + \cos\left(\varphi\right)\cos\left(\delta\right)\sin\left(\omega_s\right)\right]$$

$$N = \left(24 \times \omega_s\right)/\pi ,$$

where G_{sc} is the solar constant = 0.0820 (MJ m^{-2} min^{-1}), d_r is the inverse relative distance Earth-Sun, ω_s is the sunset hour angle. The hour angle, expressed in radians, is measured at sunset when the sun's center reaches the horizon. φ is the latitude of the site (radians) and δ is the solar declination (radians).

$$d_r = 1 + 0.033 \times \cos\left(2\pi J/365\right)$$

$$\delta = 0.409 \times \sin\left[\left(2\pi J/365\right) - 1.39\right]$$

$$\omega_s = \arccos\left[-\tan\left(\varphi\right)\tan\left(\delta\right)\right],$$

where J is the 15th day of each month in the year (for monthly calculations).

Using the least squares method, the linear model was chosen in this study because is the most used and the simplest model for an unknown trend in this type of analysis. The data were subjected to a 5-year running mean to find the trends. In order to simplify the trend, a linear trend line was added to the series.

It is known there are different statistical tests considering trend analysis (C. T. Haan, 1977; B. Bobee and F. Ashkar, 1991; J. D. Salas, 1992). Therefore, in order to analyze any possible trend in the time series, the statistical significance was determined by the Mann–Kendall and Student's *t* tests.

The Mann-Kendall test, as it is proposed by R. Sneyers (1990), was used to confirm the significance of the observed trend. By a formula similar to the one referred to in J. M. Michell et al. (1966), the Mann-Kendall rank statistic calculates all $u(t_i)$, $1 \le i \le n$. Before applying the test, the number m_i of terms Y_j in the series preceding each term Y_i ($i > j$), is calculated such that $Y_j < Y_i$. The statistical test t_i is, therefore, defined as follows:

$$t_i = \sum_i m_i \ .$$

The distribution of the test statistic *t*, under the null hypothesis, is asymptotically normal with the following mean and variance:

$$E(t_i) = i(i-1)/4 \ , \quad \mathrm{var}(t_i) = i(i-1)(2i+5)/72 \ .$$

The sequential values of the statistic $u(t_i)$ are then given by the equation:

$$u(t_i) = \left[t_i - E(t_i)\right] \Big/ \sqrt{\mathrm{var}(t_i)} \ .$$

The null hypothesis H_0: $b = 0$ is rejected when the final value $u(t_n)$ of the $u(t_i)$ statistics for $i = n$ is greater, in absolute value, than 1.96 for a two-tailed test at the 95% significance level, and 2.58 for a two-tailed test at the 99% significance level, where *n* is the size of the time series. According to Ch. Goosens and A. Berger (1986), the Mann-Kendall rank statistic is considered the most appropriate for the analysis of trends in climatological time series or for the detection of a climatic discontinuity.

Apart from this, the linear trend fitted to the data was also tested with *t*-test to verify results obtained by the Mann–Kendall test. This second test, also named the Student's *t*-test, is a common method for trend analysis of climatic parameters (N. Chattopadhyay and M. Hulme, 1997). The *t*-test method (G. Snedecor and W. Cochran, 1989) was also used to confirm the significance of the observed trends. In this method, the regression line establishes differences between time (in years; x), which is taken as the independent variable, and global solar radiation/precipitation (y), which is taken as the dependent variable. Intercept and line slope can be calculated through error minimization. Then, *t* statistics is computed. The formula for *t*-statistic is the ratio between *b* and s_b, where *b* is the intercept of the regression line and s_b is the standard deviation of the data.

$$S_b^2 = S^2 / \sum (X_i - \overline{X})^2 \ ,$$

where S^2 can be determined through the bellow equation:

$$S_b^2 = \sum (Y_i - \hat{Y}_i)^2 / (n-2) \ .$$

The null and alternate hypothesis is given as H_0: $b = 0$, H_1: $b \neq 0$. The H_0 hypothesis at α level of significance is rejected when $|t| > t_{1-\frac{\alpha}{2},\, n-2}$ from the *t*-student table (*n* = sample size).

Therefore, the slope of the trend line is significantly different from zero and there is a trend in time series.

4. RESULTS AND DISCUSSION

In this study, we investigated annual and seasonal global solar radiation trends in the Cluj-Napoca area for the period 1921 to 2009. The statistical results are presented in table 1. The time series analysis of the global solar radiation was also made on a short-term and it revealed increasing trends of this variable, being significant (S. V. Tahâş et al., 2011).

4. 1. Annual global solar radiation trends

The mean annual global solar radiation along with 5-year moving mean and trend line is presented in fig. 2. Table 1 shows mean, regression slope estimate, Mann-Kendall (M-K) and *t*-test statistics, standard deviation (S.D.) and coefficient of variation (C.V.) for the monthly, seasonal and annual GSR of Cluj-Napoca station for the period 1921–2009.

Statistical results for the global solar radiation at Cluj-Napoca (1921–2009).

Table 1

Season	Mean (W/m^2)	Slope (Wm^{-2}/year)	M–K	t–Test	S.D. (W/m^2)	C.V. (%)
Months						
December	38.019	0.029	0.106	1.766	4.097	10.8
January	46.635	0.068	0.223[2]	3.049[2]	5.729	12.3
February	78.254	0.108	0.191[2]	2.624[1]	10.384	13.3
March	128.995	0.086	0.110	1.538	13.702	10.6
April	176.828	0.251	0.253[3]	3.749[3]	17.430	9.9
May	226.801	0.164	0.146[1]	1.873	21.621	9.5
June	247.536	0.246	0.169[1]	2.652[2]	23.240	9.4
July	255.865	–0.008	–0.031	–0.112	18.014	7.0
August	224.297	0.044	0.068	0.627	17.303	7.7
September	161.879	–0.021	–0.013	–0.350	14.486	8.9
October	106.199	0.130	0.158[1]	2.788[2]	11.774	11.1
November	55.432	0.009	0.050	0.321	6.830	12.3
Seasons						
Winter	54.303	0.070	0.243[3]	3.921[3]	4.674	8.6
Spring	177.541	0.168	0.246[3]	4.031[3]	10.913	6.1
Summer	242.566	0.094	0.144[1]	1.958	11.845	4.9
Autumn	107.837	0.039	0.073	1.300	7.401	6.9
Annual	145.562	0.093	0.268[3]	4.380[3]	5.628	3.9

[1] Significant at 0.05 level, [2]significant at 0.01 level, [3]significant at 0.001 level.

Fig. 2 shows annual global solar radiation (GSR) trends for Cluj-Napoca over the period 1921–2009 using a linear regression model. The slope of the regression line represents the rate of change in *y* (dependent) as *x* (independent) changes.

At Cluj-Napoca meteorological station was observed a considerable variability between different years, with a standard deviation of 5.628 W/m^2 and a coefficient of variation of 3.9%, while the multiannual mean global solar radiation (GSR) during the period 1921–2009 (89 years) was 145.562 W/m^2.

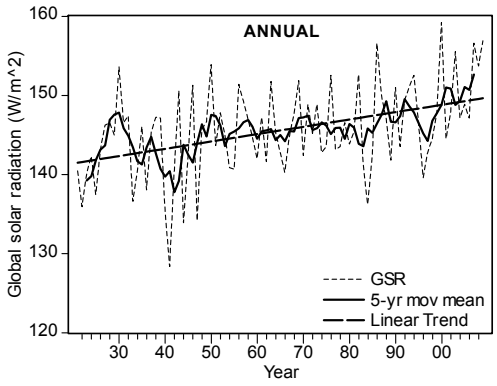

Fig. 2. Five-year moving average and trend line of annual GSR at Cluj-Napoca (1921-2009).

An positive slope of 0.093 Wm^{-2}/ year was noticed for annual mean GSR. According to the M-K and *t*-tests, this increasing trend is statistically significant at 0.001 level. In the studied period, the year 2000 had the greatest annual mean value (159.21 W/m^2), while the year 1941, with 128.373 W/m^2, had the lowest value.

At analyzed station and also according to H. C. Power (2003), it was observed that one of the most likely causes of increase in global solar radiation (GSR) is due to the long-term decrease in aerosols. It can be said that changes or perturbations in the amount of aerosols and even in cloud cover in the atmosphere can influence the amount of solar radiation received at the terrestrial surface. Another cause that likely contributed to an increase in GSR at analyzed station was due to the increase in sunshine duration.

4. 2. Seasonal global solar radiation trends

On a seasonal scale, an estimate of positive slope is observed for all seasons (fig. 3). The greatest increase in global solar radiation during the year occurred in spring (0.168 Wm^{-2}/year). On the contrary, autumn season had the lowest increase (0.039 Wm^{-2}/year).

The other seasons, summer and winter, had an increasing trend rate of 0.094 Wm^{-2}/year and 0.070 Wm^{-2}/year, respectively. The Mann-Kendall and *t*-tests indicate that the increasing trend is statistically significant at 0.001 level for winter and spring seasons. For summer season, the trend is significant at 0.05 level according to M-K test, while *t*-test does not indicate any particular significant trend. The autumn season shows no significant trend.

The results for the monthly mean are also displayed in table 1. An estimate of positive slope is noticed in a majority of the months of the year, except months of July and September which show a negative slope. According to the M-K test, the increasing trends are significant in January, February, April, May, June and October, while the decreasing trends are not statistically significant. The *t*-test confirms the results obtained by the Mann–Kendall test that most of the increasing trends are statistical significance, except the month of May. The month with the greatest rate of increase is April (0.253 Wm^{-2}/year), which is statistical significant at 0.001 level according to M-K and *t*-tests. Standard deviation (SD) has the lowest values in the cold months (November, 6.83 W/m^2; December, 4.097 W/m^2; January, 5.729 W/m^2). On the contrary, coefficients of variation (CV) indicate a higher variability in the winter months (December, 10.8%; January, 12.3%; February, 13.3%), November (12.3%), October (11.1%), and March (10.6%) than in the other months. This appears to be due to inter-annual variability of solar radiation and differing trends in individual months that make up the various seasons.

According to assumptions of A. D. Erlykin et al. (2009), less than 14% of the observed global warming since 1956 is attributable to changes in solar irradiance. It is known there is increasing evidence that solar radiation at the Earth's surface is not constant over time but varies considerably over decades due to solar activity.

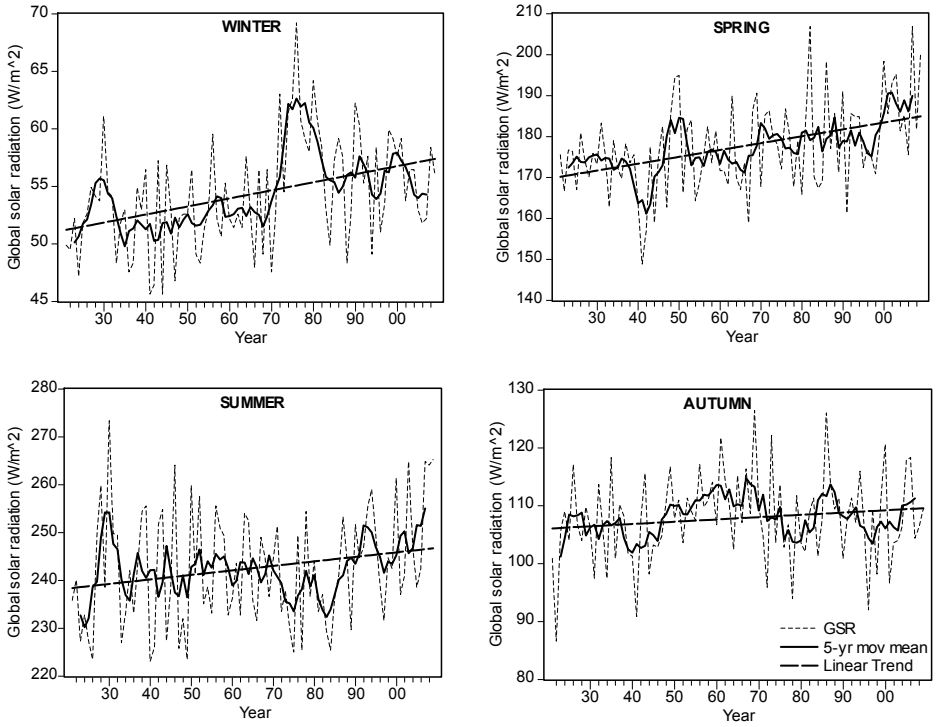

Fig. 3. Five-year moving averages and trend lines of seasonal GSR at Cluj-Napoca (1921-2009).

This is in accordance with the results presented by M. Wild (2009) who showed that there is increasing evidence that the amount of solar radiation incident at the Earth's surface is not stable over the years but undergoes significant decadal variations. Hence, we conclude that in the analyzed period the mean global solar radiation increased especially due to solar activity.

4. 3. Runs Test

Another way to test if there is a trend or an oscillation in the data is represented by the non-parametric test named Runs test. This test is an alternative to the linear and nonlinear trend models, because it does not assume that the data follow a specific distribution and it is less sensitive to extreme values. The Runs test, also called Wald–Wolfowitz test after Abraham Wald (1902 –1950) and Jacob Wolfowitz (1910 – 1981) and recommended by the World Meteorological Organization (1983), is considered to be one of the easiest to apply procedure for testing randomness (M. V. Koutras and V.A. Alexandrou, 1997) or when you want to determine if the order of responses above or below a specified value is random.

The Runs test shows if the time series are influenced by some special causes. The test is based on the idea that the variation which can occur in a process can be common or special. The common variation is a natural part of all processes in the environment. The special variation is unavoidable in most every process and is due to additional factors which came from outside the system and can cause recognizable patterns, shifts or trends in the data. As R. Hobai (2009) said, it can be difficult to detect the signal of the special variation because it is hidden in the common variation. Based on the number of runs (above or below the mean), Minitab program performs a test to determine if there are variations in the data due to trends or oscillations.

The test compares the observed number of runs with the expected number of runs above and below the mean. When the observed number of runs is statistically greater than the expected number of runs, then oscillation is suggested; when it is statistically less than the expected number of runs, then a trend is suggested.

In a standard normal distribution, the formula of the *p-value* for trends, noted here p'-value, is next:

$$p' - value = cdf\,(Z)$$

where *cdf* is the cumulative probability to *Z* which is calculated with the formula:

$$Z = [O(runs) - E(runs)] / \sqrt{\sigma^2}$$

where: *O* (*runs*) is the observed number of runs above and below the mean, *E* (*runs*) is the expected number of runs above and below the mean and σ^2 is the variance of the expected number of runs distribution. *E* (*runs*) is calculated with the formula:

$$E(runs) = 1 + [(2 \times A \times B) / N]$$

where: *A* is the number of observations above the comparison criteria (k), *B* is the number of observations below or equal to *k*, and *N* is the total number of observations (sum of *A* and *B*). The variance σ^2 is given by the formula:

$$\sigma^2 = [2 \times A \times B(2 \times A \times B - N)]/[N^2(N-1)]$$

The *p-value* for oscillation, noted here p''-value, in a standard normal distribution is:

$$p'' - value = 1 - cdf\,(Z)$$

where *cdf (Z)* has the same significances as above.

At Cluj-Napoca station, for annual global solar radiation (GSR), the observed number of runs above and below the mean (44) is less than the expected number of runs (45.5), so we can say that is suggested a trend but the difference between them is very small. The *p-values* for trends (0.750) and oscillation (0.250) are greater than the *α-level* of 0.05, so the results of the Runs test are not significant. Therefore, we can conclude that the data does not strongly indicate a trend or oscillation, but as the *p-value* for oscillation is smaller than the *p-value* for trend then it would be more appropriate to say that an oscillation has a bigger probability than a trend.

Concerning to the seasons, Runs test shows no special variation, although it would indicate a trend for summer and winter, because the *p-values* for trend are smaller than the *p-values* for oscillation, and an oscillation for spring and autumn, as the *p-values* for oscillation are smaller than the *p-values* for trend.

The only month which Runs test shows a special variation is April. As the observed number of runs above and below the mean (34) is statistically less than the expected number of runs (45.5), we can say that is suggested a trend. The *p-value* for trend (0.014) is smaller than the *α-level* of 0.05 and we can say the data strongly indicate a trend.

The results of this test show that though there is no *p-value* obtained for annual and seasonal global solar radiation below *α-level*, most of these *p-values* are closer to this level. Hence, we can consider this is a sign for a possible oscillation in evolution of GSR.

5. CONCLUSIONS

The present analysis shows that, in Cluj-Napoca, global solar radiation presents increasing trends on an annual and seasonal time-scale. Most of these trends are statistically significant for the period 1921-2009, according to the Mann-Kendall and *t*-tests. G. Stanhill and S. Cohen (2001) speculated that the two most probable causes of long-term trends in radiation are changes in aerosol loading and cloud cover. However, the relationship between aerosol concentration and solar radiation needs to be examined further because it is difficult to interpret the above results in terms of cause and effect.

The results of the Runs Test based on the number of runs above and below the mean indicated no special variation in the global solar radiation data at Cluj-Napoca station, except April which indicated a trend. Some oscillations were more probably than the trends. Because Runs Test showed only a special variation, we think these oscillations, which we may call them microcycles, are caused principally by solar activity. Hence, we can conclude that these microcycles are periodical because the time series of 89-years record at these stations are long and help us to determine accurately the long-term periodicities and to make a generalization.

However, one of the most important causes of increases or decreases in global solar radiation is attributed to solar variations, which means this is due to the changing in the amount of radiation emitted by the Sun and in its spectral distribution over years to millennia. These variations have periodic components, the main one being the approximately 11-year solar cycle. Further studies in the future could help us to understand better the effects of variations in the total and spectral solar irradiance on Earth.

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GLOBAL WARMING, SPATIAL AND TEMPORAL PATTERNS IN EUROPE

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ABSTRACT. – Global Warming, Spatial and Temporal Patterns in Europe. Using the mean annual temperatures measured in 69 European weather stations in a linear trend analysis, a comparison was made between the results thus obtained and those generated by modelling. The study aimed to outline both spatial features by mapping the trend slopes calculated for the century 1891-1990 and temporal ones resulted from decadal trend analysis. The identification of a single cooling area in central position was thus possible, along with the 3 synthetic temporal models specific to Europe, different from those inferred from the global values or those of Northern Hemisphere only. The results of linear trend analysis correspond to those of modelling, confirming the increasing values of temperatures measured in Europe during the last century.

Keywords: *global warming, linear trend, statistical significance, trend slope.*

1. INTRODUCTION

The complexity of the phenomenon defined as global warming results both from coupling the diversity of genetic factors and effects and from the various analysis methods. Therefore, an international body established by WMO[2] and UNEP[3], Intergovernmental Panel on Climate Change, to release every 6 years a report after assessing and reviewing the most recent research in scientific, technical and socio-economic fields that may have relevant information for understanding climate change. This paper presents a series of conclusions drawn from the first part of the fourth report (Solomon S. et al. 2007) and a comparison made between the results of the linear trend analysis performed on the annual mean temperature measured at 69 European stations during the last century, and the results obtained by modelling.

IPCC defines global warming as a climatic change, referring to a "modification in the state of climate that can be identified (for example through statistical tests) by changes in the mean and/or the variability of its properties that persists for a long period of time, typically decades or longer" (Baede A. P. M. 2007).

The report does not exclude the linear trend analysis, it warns on its reduced suitability for the identification of climatic changes[4], and offers the slopes calculated for the mean annual temperature, calculated both on global scale and for the Northern Hemisphere for the century 1906-2005 (the report being published in 2007, it contains data only up to 2005). Some of its most relevant results regarding last century's modifications indicate:

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[2] World Meteorological Organization.
[3] United Nations Environment Programme.
[4] Chapter 3 of First Working Group, Appendix 3.A: Low-Pass Filters and Linear Trends.

- the increase of average temperature by 0.74°C ± 0.18° C for the period 1906-2005 (HadCRUTS[1] data set); the maximum difference between two consecutive years in global average, starting with 1901, being of 0.29°C between 1976 and 1977, proves the relevance of the above mentioned 0.74°C (Trenberth K.E., 2007);

- the temperature increase rate for the last 50 years (0.13°C ± 0.03°C/decade) is almost double than the one for the last century (0.07°C ± 0.02°C/decade) (Trenberth K. E., 2007);

- 2005 was one of the two hottest years since the beginning of comparable measurements (1850), the interval 1995-2006 including 11 of the 12 warmest years (Brohan P. 2006; Smith, T.M., Reynolds R.W., 2005; Hansen J et al. 2001);

- temperatures for the continental regions increase faster than those registered for the oceans; the warming had two stage (1915-1945 and after 1975), the average temperature for land stations being exceeded by 0.7°-0.8°C, while those for the oceans only by 0.4°C after 1975; (Brohan P. 2006; Smith T. M., and Reynolds R. W. 2005; Hansen J et al. 2001; Lugina K. M. et al. 2005; UKMO Rayner N. A. et al 2006);

- changes in extreme temperatures coincide with global warming (Trenberth K. E., 2007);

- the increasing rate of temperatures in arctic area is about twice higher than the global average of the last 100 years (Trenberth K. E., 2007);

-changes in cryosphere and oceans level are according to the changes in temperatures (Trenberth K. E., 2007).

The connection between temperatures evolution along the XXth century and its influence factors is often estimated as: „little change prior to about 1915, a substantial fraction of the early 20th-century change was contributed by naturally occurring influences including solar radiation changes, volcanism and natural variability; from about 1940 to 1970 the increasing industrialisation following World War II increased pollution in the Northern Hemisphere, contributing to cooling, and increases in carbon dioxide and other greenhouse gases dominate the observed warming after the mid-1970s" (Trenberth K.E., 2007). Therefore, emphasizing the human factor's importance, the third assessment report (2001) concluded that warming of the XXth century is „very unlikely (< 10%) to be due to internal variability alone as estimated by current models" (Hegerl G. C. 2007).

Some researches, (IDAG[2] 2005, Stott P. A., 2003) indicate global warming as identifiable at a regional scale. Accordingly, this study wants to highlight the local manifestations of the phenomenon in Europe.

2. METHODS AND DATA

The linear trend analysis for the mean annual temperatures (obtained from the archive of NCDC[3]) was performed for 69 European stations (fig.1). Since for the majority of them the time series ended in 1991, in order to establish a common period of minimum 100 years, included to the XX th century if possible, the best option was the interval 1891-1990.

Furthermore, for each time series the possibility of describing a linear trend was checked by using the non-parametric test of Mann-Kendall. The test is applied when there is the probability that x_i values respect the model $x_i = f(t_i) + \varepsilon_i$, where: f(t) is a monotonic increasing or decreasing function and the residuals ε_i are supposed to pertain to the same distribution of zero mean. It is a hypothesis test, verifying the null hypothesis of non-existing trend H_0, indicating thus that the values are randomly distributed in time, compared to the alternative hypothesis H_1 when a monotonous increasing or decreasing trend is confirmed (Salmi T et al., 2002).

[1] Hadley Centre/Climate Research Unit gridded surface temperature data set.
[2] International Ad Hoc Detection and Attribution Group.
[3] National Climatic Data Center.

1	Friedrichshafen	5	Debrecen	9	Stonyhurst	12	Bidston	15	Constanța
2	Hohenpeissenberg	6	Tg Jiu	10	Southampton	13	Cluj-Napoca	16	Durham
3	Klagenfurt	7	Roman	11	Braemar	14	Odesa	17	Saentis
4	Dr.T. Severin	8	Berlin-Dahlem						

Fig. 1. Stations included to the study.

The existence of a linear trend is confirmed by the value of the normal approximation Z. A positive one indicated an increasing trend, while a negative one a decreasing trend. The significance levels confirming them, used by Makesens application are 0.001, 0.01, 0.5 and 0.1. To estimate a real slope of an existing trend, the non-parametric method of Sen is used, when assuming the slope is linear according to the formula $f(t) = Q + B$, Q being the slope and B the constant.

3. RESULTS AND DISCUSSIONS

The results thus obtained, where used for graphic representations and compared to those identified for the global land and land of the Northern Hemisphere. Out of the 69 stations, 66% describe a positive trend, 12% a stationary one defined by the slope interval of -0.2-0.2°C/century, while 11% a negative trend. Considering the statistical significance, 58% of trend values are considered significant by exceeding the 0.5 threshold, 7% are confirmed by the 0.1 value, while for 24 stations the significance does not reach that value. Slopes' values define a medium variation interval of about 3°C/century, generated by the minimum of -1.09°C/century (Milan) and the maximum of 1.87°C/century (Moscow).

Considering the slope values identified for the period 1891-1990 for mean annual temperatures measured at land stations at a global scale or only for the Northern Hemisphere, values of 0.42°C/century and -0.4°C/century, we must mention that both were exceeded in 42 cases (for 38 stations a positive trend being defined, while a negative one appears only for 8 of them).

Fig. 2. Linear trend slope and their corresponding statistical significance, defined for the period 1891 – 1990 at the 69 stations (°C/century).

Maxima, Minima and variation interval of linear trend slopes for land temperature anomalies at global scale, for the Northern Hemisphere and Europe. The maximum value of each series is bolded while the minimum is in italic (°C/decade).

Table 1

Decade	1891-1900	1901-1910	1911-1920	1921-1930	1931-1940	1941-1950	1951-1960	1961-1970	1971-1980	1981-1990
Global land	**0.41**	-0.15	0.10	0.02	0.23	**-.27**	0.00	-0.16	0.28	0.39
Northern Hemisphere land	**0.41**	0.12	-0.09	0.01	-.19	0.27	0.05	0.26	-.19	**-.53**
Land and ocean globally	**0.24**	-0.30	0.17	0.15	0.20	**-.32**	0.02	0.01	0.22	0.16
Land and ocean Northern Hemisphere	0.28	-0.25	0.18	0.22	0.14	**-.26**	-.01	-0.12	0.26	**0.30**
Variation interval- global values	**0.65**	-0.45	0.27	0.17	0.43	-.59	***0.02***	0.17	0.50	0.54
Variation interval - N. Hemisphere	0.70	0.36	0.26	0.22	0.33	0.53	***0.06***	0.38	0.45	**0.84**
Maximum Europe	1.63	1.29	2.06	1.74	2.46	**3.56**	1.58	1.04	0.97	2.03
Minimum Europe	-2.00	-1.12	-.39	-.22	-.56	-.20	-.11	***-3.47***	-.29	-.03
Variation interval - Europe	3.63	***2.41***	3.44	3.96	3.01	**4.76**	2.69	4.51	3.25	3.07

3. 1. Temporal patterns

In order to observe the temporal evolution of the mean annual temperature, the data was divided on decades, and the linear trend slope was calculated for each of them. A series of important differences between the decadal slope values for the European stations and those calculated at a global and hemisphere scale were highlighted, both as value and location in time of maximum and minimum.

The graphic representation (fig. 3) of the results lead to the identification of similar variation patterns between stations of same area and between those for the European stations and those for the global and Northern Hemisphere values.

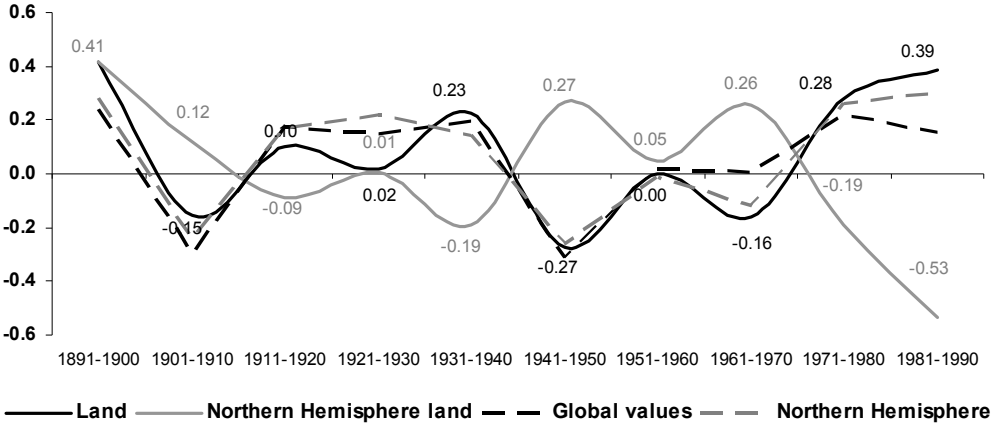

Fig. 3. Decadal evolution of trend slopes of global land and Northern Hemisphere land anomalies (°C/decade).

Anomaly[1] values calculated for the global land, synthesize a three maximum curve, peaks being registered for the first and the last decade and for 1911-1940. In contrast, Northern Hemisphere land anomalies follow a two maxima curve, one at the beginning of the century and the second in 1941-1970

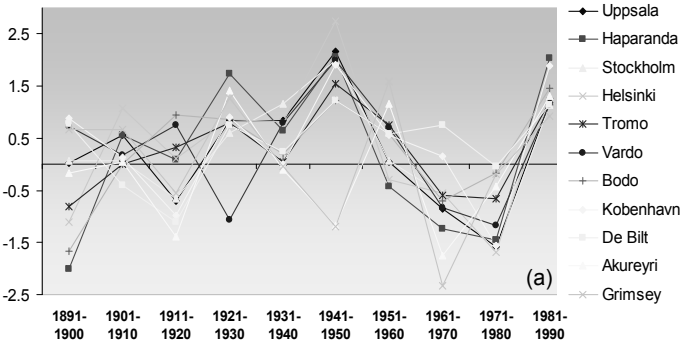

Fig. 4. Decadal evolution of linear trend slopes for stations of Northern Europe (°C/decade).

[1] The temperature anomalies where calculated because they where the only values available for the hemispheres, distinction being made between those calculated only for the land and those resulted from cumulating the land and ocean.

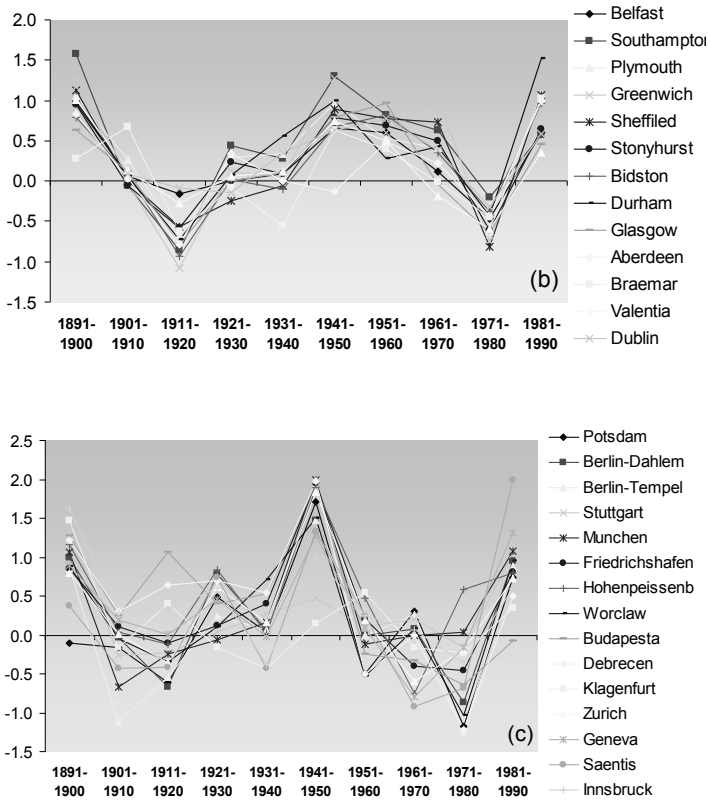

Fig. 4. Decadal evolution of linear trend slopes for stations of British Isles (b) and Central Europe (c) (°C/decade).

contrasted by an important decrease in 1900s and 1970-1980.

In the case of the European values, those calculated for the stations of the northern countries indicate positive trends, of important slope and significance (fig. 4a). Their graphic representation is similar to that of the Northern Hemisphere land anomalies in the two-maximum structures, but the periods differ, here the high values of 1940s and 1980 being separated by an important drop in 1970. This minimum indicates differences of about 3-3,5 ºC/decade between 1940 and 1970 and of 2,5-3ºC/decade for the last two decades. The British Isles have a particular evolution, fairly uniform, described by small values, comprised in a variation interval of about 1ºC (fig. 4b).

Except for the beginning and end of century when values decrease in 1910s and increase in 1970s, the curve is a simple one, having only one maximum in 1940, resembling thus the evolution of global land. The structures representative for Central Europe use the same maximum of 1940s to build symmetry around it with minimum values of 1901-1920 and 1971-1980 closed by the maximum of beginning and end of century. The three-peak graphic representation makes it similar to the pattern of global land, the differences lying in the decades they appear. The variation interval is of 2.3 ºC (fig. 4c).

Therefore, three evolution patterns specific to Europe can be identified: Northern Europe's, a pattern of important variations, the British one with reduced inflections, and that of Central Europe, with symmetrical distribution around the maximum of 1940s. (fig. 5) The common elements are: the maximum of 1940s, although for the British model it is flattened, and the important increase for the 1980s, of minimum 1 ºC compared to the previous decade.

Fig. 5. European patterns of temporal evolution for the century 1891 – 1990 (°C/decade).

3. 2. Spatial patters

The interpolation of linear trend slopes calculated for the century 1891-1990 at the 69 stations, facilitated the identification of regional manifestations of global warming. An increase in annual mean temperature is observed for the eastern, northern and western parts of the continent; it is confirmed by high slope values, emphasized by important significance levels (0.01 and 0.001) (fig. 6): 1,86ºC/century for Moscow, 1,11ºC/century for Sankt Petersburg, 1,01ºC/century for Tromo, 1,17ºC/century for Copenhagen, 1,37ºC/secol for Lisbon and 1,12ºC/century for Madrid.

Fig. 6. Distribution of linear trend slopes calculated for the century 1891-1990 (°C/century).

The lack of observation data makes it impossible to state any hypothesis for the Southern part of the continent, the only available stations, Milan (-1.09 ºC / century) and Athens (0,12ºC /century), indicating a stationary or rather negative trend.

The location of areas with increasing mean annual temperatures highlight the central area of decreasing mean annual temperatures, that is confirmed by the statistically significant linear trend slopes calculated for the stations occupying the central and western parts of Romania, Ukraine and south of Poland: -0.99ºC /century at Sibiu, -0.78ºC/century at Bistriţa, -0.42ºC/century at Timişoara, -0.9ºC/century at Lvov and -0.62ºC/century at Worclaw.

For Europe's major islands, The British Isles and Iceland, the values indicate an average warming of about 0.5ºC/century, similar to the value attributed to oceans' warming (Smith and Reynolds, 2005), though in Scotland they drop under 0.2ºC/century, proving more of a stationary trend, while in the southern parts and Iceland, values reaching 1.08ºC/ century at Dublin, 0.71ºC century at Greenwich, or 0.74ºC/ century at Akureyri, mark an increasing trend.

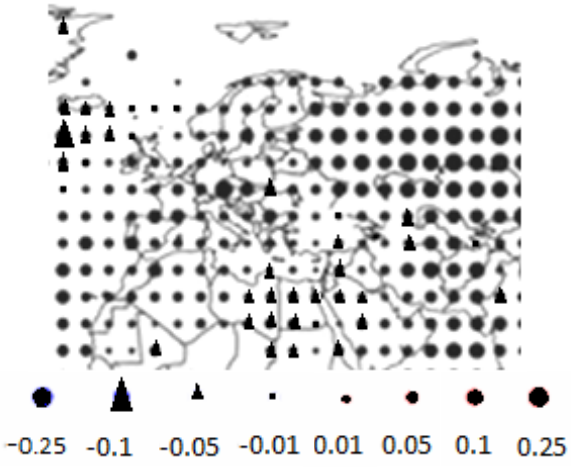

Fig. 7. Grid map of slope distribution for linear trend calculated for mean annual temperatures of 1891-1990 century.
Source: http://www.ncdc.noaa.gov/gcag/ accessed in January 2008) (°C/century).

The results of the interpolation, confirm those extracted from the grid map (created in NCDC's Climate at a Glance application, accessed January 2008, fig. 7), where the central area of decreasing mean annual temperatures is indicated by a slope of -0.05ºC / century. The average slope value calculated for the station included to the cooling area indicated a decrease of 0.74ºC/century. The difference between the two values can be partially explained by the fact that on composing the grid, values are leveled and they include also the measurements performed in ocean areas. Schönwiese's map also (Schönwiese, Rapp 1997) confirms the increasing mean annual temperatures for the western, northern and southern parts of the continent and for the cooling area overlapping on Romania, Poland and Ukraine it indicates a stationary trend, by including it to the 0 ºC isotherm.

The results of linear trend analysis can be influenced by two important factors: the time span and the location of weathers stations used, that must be relevant for the study area. There is also always the probability that the phenomenon does not have a linear evolution. The comparison of the three study periods 1891-1990, 1901-2000 and 1906 – 2005 in table 2 reflects the relevance of a correct time span. Including the decade 1991-2000 and the 5 years following it, that comprise the first 11 of the hottest years, implies a trend change, from a decreasing one to an increasing trend and a reduction of the slope by 0.13 ºC/century, 0.1 ºC/ century, respectively 0.62 ºC/ century for the stations Iaşi, Timişoara and Bistriţa, and by 0.27 ºC/century for the cumulated values of continental stations of Northern Hemisphere. An important augmentation of slope was registered for Constanţa (by 0.69 ºC), while at Sibiu, the slope is reduced by 0.86 ºC, thus Sibiu adopting a stationary trend, compared to the attribute of highest drop in temperatures it had for the first period.

The recent warming IPCC refers to is attributed to the period 1979-2005. The above mentioned differenced are justified, if the slope values calculated for this period in 10 Romanian stations are considered (the time series of Târgu Jiu ends in 2000, while for Bacău data being available only for the interval 1961-2005) (table 3). In 9 cases the trend is positive, Bucureşti being the only exception, describing a stationary one. The trend slope values range from 0.25°C to 0.44°C, exceeding that of the Northern Hemisphere but not the one of the Northern Hemisphere's land. Sibiu is again an exception, mean annual temperatures seem to have increased by 0.56 ºC during 1979-2005, value confirmed by an important statistical signification of 0.001.

Slope values (°C) for linear trend calculated for the mean annual temperatures of Northern Hemisphere, the land of Northern Hemisphere and for the Romanian stations in three distinct periods. Bolded values represent stations with important changes in slope, underlining marks also change in trend type.

Table 2

Station	1891-1990		1901-2000		1906 - 2005	
	Signif	Slope	Signif	Slope	Signif	Slope
Northern Hemisphere land	**0.001**	**-0.40**		**-0.08**		**0.13**
Northern Hemisphere	0.001	0.38	0.001	0.52	0.001	0.62
Iaşi		**-0.31**		**-0.02**		**0.18**
Constanța		**0.21**	**0.5**	**0.65**	**0.01**	**0.90**
Timişoara	**0.1**	**-0.43**	**0.1**	**-0.42**		**0.33**
Bucureşti -Filaret	0.01	0.63	0.01	0.66		0.28
Bistrița	**0.5**	**-0.78**		**0.06**		**0.16**
Sibiu	**0.001**	**-0.99**	**0.1**	**-0.39**		**-0.13**
Cluj-Napoca		0.16		0.10		0.25
Roman	0.01	0.78	0.5	0.76	0.01	0.80
DrobetaTurnu Severin		0.39		0.14	0.01	0.68
Târgu Jiu		0.39		-0.02	-	-

Slope values (°C) for linear trend calculated for the mean annual temperatures of Northern Hemisphere, the land of Northern Hemisphere and for the Romanian stations for 1979-2005

Table 3

Station	Signif	Slope	Station	Signif	Slope
Northern Hemisphere	0.001	0.25	Drobeta Turnu Severin	0.5	0.33
Northern Hemisphere Land	0.001	0.48	Bistrița	0.5	0.31
Iaşi	0.1	0.4	Sibiu	0.001	0.56
Constanța	0.1	0.37	Cluj-Napoca		0.22
Timişoara	0.1	0.25	Roman	0.5	0.45
Bucureşti		-0.18	Bacau	0.5	0.4

Slopes calculated for the values of temperatures measured only in continental stations of the Northern Hemisphere, or for cumulating land and ocean, confirms the phenomenon of global warming for that period, by the statistical significance of 0.001, while in the case of Romanian stations the significance does not exceed 0.5. A 50 years cycle created by the maxima of 1940s and 1980s is confirmed for the Romanian stations and especially for the Intra-Carpathian ones (Holobâcă I. H. et al 2007). The two peaks also indicate the moment when significant increasing trend appear in summer and winter mean maximum temperatures, while the most important decrease in mean maximum temperatures for Romanian stations appears in autumn around 1969 (Tomozeiu Rodica et al. 2002), highlighting thus the increase in 1970s and 1980s.

4. CONCLUSIONS

The analysis of global warming at a large scale includes Europe in the general trend of increasing mean annual temperatures for the last century, while, reducing the study only at continental level, different features of linear trend distribution appear. The analysis performed for the period 1891-1990 stated the existence of a central area with an average decrease of mean annual temperatures of 0.74°C/century, in contrast to the increase of about 1°C/century calculated for the Eastern, Northern and Southern parts of the continent.

In what the temporal evolution is concerned, the indirect correlation between maxima and minima of global models is emphasized, along with the common maximum of 1940s for the continental patterns. The other inflections are disposed around the maximum both symmetrically (as is the case of Central Europe model, and to a lesser extend that of the British model) or asymmetrically (case of Northern Europe model).

Therefore, the analysis confirms that the obtained results from measured data are according to those resulted from modeling. However, acceptance of estimated properties variations for the meteorological parameters in a certain area for a certain period of time must be preceded by an evaluation of influence factors: the database used and the type of data it contains, the study period and area, the method used and the relation with the other elements of possible disturbing influence.

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GEOMORPHOLOGIC AGGRADATION, EXPRESSION OF THE CLIMATIC CHANGES - SITUATIONS AND STRUCTURES SPECIFIC FOR ROMANIA - TRANSYLVANIA

I. MAC[1], V. SOROCOVSCHI[1], MARIA HOSU[1]

ABSTRACT. – Geomorphologic Aggradation, Expression of the Climatic Changes -Situations and Structures Specific for Romania – Transylvania. The geomorphostructures, when defined as formations of accumulation with dynamic and grading organisation, are considered to be the expression of the factors involved in the dislocation, transport and redepositing processes. Geomorphologic sensitivity plays, in this case, an essential role. The formation, the increase or decrease of the morphostructures set up through aggradation or degradation phenomena, give hints about the changes of the factors responsible with the dislocation, transport and depositing. At the same time, the changes in grading, as well as those in the mineralogical composition and configuration of the morphostructures, illustrate the differentiation in time and space of the control variables actions. The study of some geomorphostructures in the Transylvanian Basin, such as alluvial beds, deposit fan structures (gullies, torrents), basal glacisses, lake sediments, evidentiated the role of the climate as a relief factor. As regarding the slopes, due to an accelerate erosion, an increase of the alluvial fans and of the basal glacises was noticed. The lake basins in the Transylvanian Plain are also characterized by an increase in the sedimentary deposits as a result of the inputs from the surrounding areas. On the whole, the morphostructures dimension, referring both to their volumes and geometry (configuration), is influenced by the various material inputs and by differences in the dynamic (transport) process (slopes and river beds), all these in the context of a general increase of the "dryness" (aridity) phenomenon. The rhythmgrams of the various sediments (lake, fluvial) clearly illustrate the sequence of the climatic manifestations, as well as the general trend towards heating and dryness (aridization).

Keywords: *agradation, climatic changes, Romania, Transylvania*

1. INTRODUCTION

The geomorphologic researches which took into analysis the climatic factor, determined the specialist to admit that the various geomorphic ensembles are associated to some climatic conditions. This fact was fully accepted when the correlation referred to macro scale relations, while in the case of micro scale approaches, the opinions were rather contradictory. With all these, the investigations relevate, especially for the aggradation geomorphic structures, strong relations (direct, indirect) with the short time climatic changes.

The literature in the field (for example J. Tricart, T. Cailleux, 1972, J. Büdel, 1982) offers detailed information about the correspondence situations for Pleistocene and Holocene, but also for the historical period (for example R. J. Chorley and all, 1985). In this respect, as regarding Europe it is worth mentioning the Medieval Climatic Optimum (1000 – 1200),

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when the temperature was 0.4^0C higher, and the Little Glaciation (1600 – 1900), when the annual average temperature decreased with 1^0C. During the latest period, a rapid temperature raise was registered, the twentieth century being the warmest of the last six hundred ones. Geomorphodynamic responses to this kind of changes were immediately registered in the fluvial systems of the slopes, as well as in the lacustrine and periglaciar ones. The data regarding the lacustrine volumes of the alpine-type lakes in the postglacial epoch also in other regions of the Northern Hemisphere as in Canada are already semnificative. The aggradation fluvial structures and the cryostructures suffered relevant metamorphoses.

Our observations (direct, indirect) on the modification of some fluvial channels in the Transylvanian Depression, on the silting of the lake basins and on the evolution of the glacises in the same study area, allowed us to conclude that the aggradation process and its correspondent forms are related to the latest obvious warming (in the last 100 years).

2. METHODOLOGY AND STUDY PHASES

The methodological background of the researches consists of the following facts: the thermodynamic interpretation of the transformations having place in the geomorphologic systems; the admittance of a dissipative behaviour in the case of the fluvial geomorphic systems; the considering that the unstable landforms (for ex. the river channels, the slopes) are rapidly affected even by slight geomorphoclimatic perturbances, being characterized by a reduced resistance to change; the level of geomorphologic sensitivity and the systems responses are influenced by the externalities related especially to the geologic substratum and to the climatic changes.

At the same time, it is to be noticed the difference in opinion as regarding the genesis of the braided channels: they form when the rivers have steep slopes and abundant solid discharge (S. A. Schumm, 1977, L. B. Leopold at all. 1982); they develop in the case of a flow incompetence and of an uplift of the alluvial bed due to the alluvial discharge (J. C., Brice,1966, S. A. Schumm, 1985).

No matter how we classify the channels into straight, sinuous or braided (L. B. Leopold at all. 1964 or C. Brice, 1966, S. A. Schumm, 1977), there still remains a major problem to be taken into consideration which is the appearing and development of the alluvial beds and its generating factor.

We consider that, in the genesis of the alluvial beds, beside the bedrock, the climate and related to it, the river hydraulic regime with the lateral and vertical accretion, has a major role.

*The main used concepts (evaluated and applied):*the concepts of the river channels formation and evolution; the concept of the synergic relations existing in a geosystem (river, rock, climate, relief etc.); the concept of landscape sensitivity and the response of the fluvial, lake or slope systems; the concept of the sequential and sectorial development of the fluvial channels; the aggradation concept as a form of the geostructures mass growing through vertical accretion (upbuilding).

The study was elaborated according to the following investigation phases:(i) bibliographical research; (ii) the morphological, climatical and hydrological analyses based on various data sources; (iii) land survey; (iv) phenomenological geophysical correlations; (v) assessment of the geomorphostructures (form, granulometry, volume etc.) from the point of view of the fluvial, lacustrine and slope aggradation. In the end, we comment on the genesis of the forms and on the climatic context they occur.

3. SPECIFIC AGGRADATION FORMS AND SITUATIONS

The aggradation concept we applied in our paper reffers to the structures growing through accretion (lateral, vertical). The concrete growing forms were differently assessed because of the various systems the analysed geographical components belong to: fluvial system, lake system, slope system.

3. 1. River Channels Case

The observations and interpretations focused on the channels of the main rivers in the Transylvanian Basin: Mureş, Someş and Olt .

General assertions and examples: the channels are characterized by restrictions in the transversal section, the major channels missing or being extremely reduced; the sectorial character of the channels manifests through the reduction of the straight and unitary segments to the advantage of the braided ones; the channel beds are undoubted agradated; tThe dominant tendency is that of aggradation through vertical accretion; the aggradation rhythm increased in the last two decades and, in our opinion, it is related to the tendency of the climatic aridization. In this way the alluvia in suspension were deposited over the bad-load, determining an uplift of the alluvial bed; the Arieşului Valley (with a basin of 2.970 km^2, multiannual Q = 24.7 m^3/s, sediment load of 3.84 kg/s – Turda station), belonging to the Mureş River Basin, represents a very representative case, especially because of its inferior corridor.

Fig. 1. Unitary and sinuous channel (The Aries River at Luncani).

The straight sectors are very restricted, while the sinuous and the braided ones become dominant (fig. 1, 2, 3). The channel braiding and the alluvial bed uplifting (fig. 4) increased as a result of the discharge lessening which is due to the warming registered in the last 100 years.

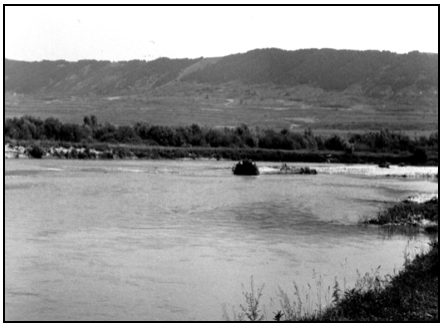

Fig. 2. Channel with incipient alluvionary bars.

Fig. 3. Braided channel and heightener alluvial bed.

3. 2. Lake Basins Case

The sediments of the lakes in the Transylvanian Plain, a territory ecosystemiccaly fragile, should be the subject of paleoecologic, paleoclimatic and geomorphologic studies, because they offer direct information about an area in which the climate interacts in a very special way with the human civilization, locally and regionally.

We focused on those lakes in the Transylvanian Plain, which got a pond character being located in the low sections of the channels (minor channels, major channels). The spatial distribution of these thirty ponds is rather unequal: 55.5 % in the Mureş River Basin, 35.1 % in the Someşul Mic one and 9.4 % in the basin of the Someşul Mare River. Usually the lakes appear in complexes and only rarely singularly.

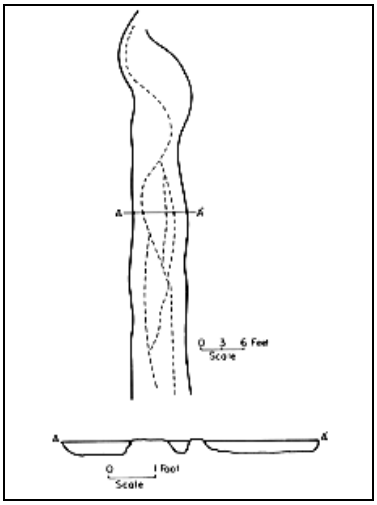

Fig. 4. Braided channel (the dashed line indicates the position of the thalwegs) (after Schumm and Khan).

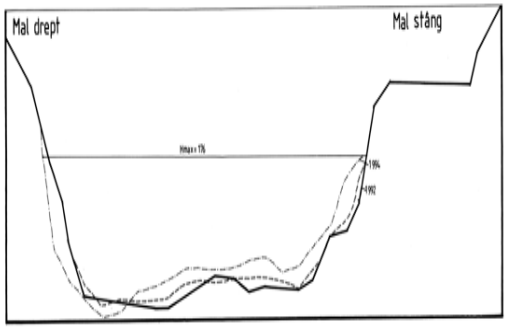

Fig. 5. The heightening of the alluvial bed (location-Turda).

The study on the silting of the lakes was worked out through: topobathymetric surveys; discharge measurements for the tributary rivers; meteorological measurements (precipitations, evaporation); comparative temporal analyses: the data between 1957 – 2002 were used; comparative cartographical analyses: the spatial characteristics of the cuvettes in 1855, but also on the 2000 actual maps.

The limnic aggradation (silting) is explained through: the decreasing in the discharge for the brooks in the Transylvanian Plain, fact which affected their transport capacity and determined a sediment evacuation when crossing limnic thresholds. For example, the specific average discharge here, of 2.6 l/s/km^2, is much under the country average value which is of 4,7 l/s/ km^2.

The considerable sedimentary inputs coming from the slopes: in the case of short and intense rains, the slopes provide with important mass material the low sections of the valleys. That is why the maximum aggradation areas in the lake basins correspond to the places where the tributaries, the torrents and the gullies discharge. Here, at the entrance into the cuvette, alluvial cones forms, reducing the depth of the lakes on rather important sections; the material resulted from the decay of the biogen elements and the accumulation of sapropelic mud.

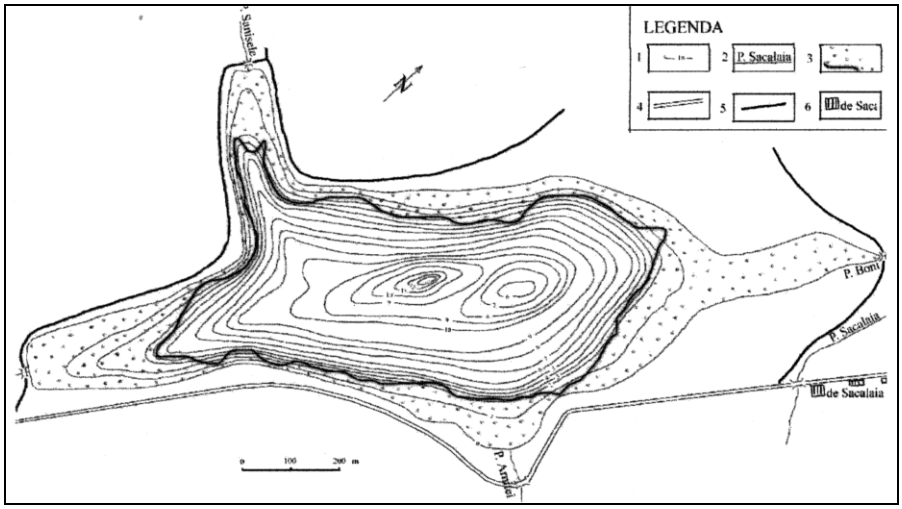

Fig. 6. Bathymetrical maps of the Ştiucii Lake (1957-8 A, 2000-8 B).
1: isobath; 2: water courses; 3: the extension limit of the hydrophyl vegetation;
4: county road; 5: communal road; 6: household, hut.

The phenomenon has increased lately because of the hydrophilic vegetation extension, came as a result of the modification in the morphometric elements of the lake.

In order to illustrate the silting phenomenon, we chose the Ştiucii Lake, situated at 274.5 m height in the basin of the Bonţului Valley, Transylvanian Plain. In 45 years, the

morphometric elements of the lake significantly changed (fig. 6 A şi B). The silting (aggradation) evaluation was made through comparing the characteristic volumes obtained from the interpretation of the 1957 and 2000 topobathymetrical surveys. The decreasing of the characteristic volumes (absolute, relative) proves the intense silting level. In 43 years, the total volume decreased with 52% with an annual average rhythm of 1.22%.

The reducing of the lake volume can be noticed also on the graph of the capacity line, for both the topobathymetrical surveys (fig.7). Although the silting level of the lakes in the Transylvanian Plain varies from place to place because of the physical-geographical differentiations of the control variables, the phenomenon can be generalised, an increase in the silting rhythm being noticed in the last 50 years.

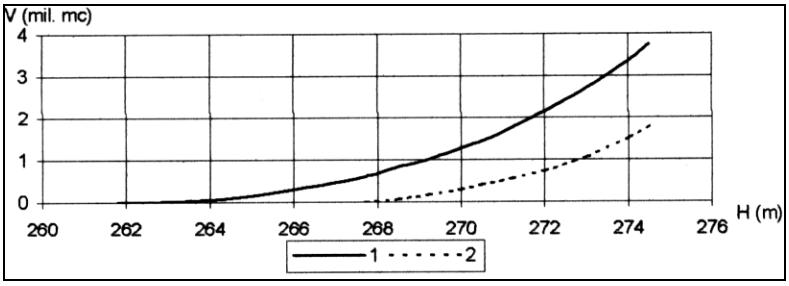

Fig. 7. The capacity line of the Stiucii Lake.

3. 3. The Case of the proluvial-coluvial structures

Fig. 8. Basal glacis and older slide body.

Strong related to the slope dynamics, the proluvial-coluvial structures (alluvial fans, glacisses etc.) in the Transylvanian Depression were characterized by lenghtenings in double direction as well as by new sediments superposition. The control variables showing the level of the aggradations of these kind are: the friabil litology in the Transylvanian Basin – pelitic and psaphitic tertiary formations, rarely psamithic; the missing of a continuous vegetation layer and a high level of deforestation; high agricultural land-use; the latest (1980-2004) extreme climatic manifestations (heavy rainfalls, high temperatures); pluvialdenudation, landslides, sheet denudation; the accelerated sheet and incipient talwegs erosion.

Without getting into detailes as concerning the data operated for the identification of the phenomenon, it is worth mentioning the basal glacisses which characterize all the slopes getting in contact with the river flats.

Beside their interposition between the river flats and the slopes, attenuating the morphological contacts, these glacisses also „burry", through their material load, other older slope landforms formed in the more humid climatic conditions of the Holocene, as landslides for example (fig.8).

4. CONCLUSIONS

Even if the morphoclimatic researches on the Holocene and on the hystorical period for the Romanian territory are rather modest, they should be sustained and amplified.

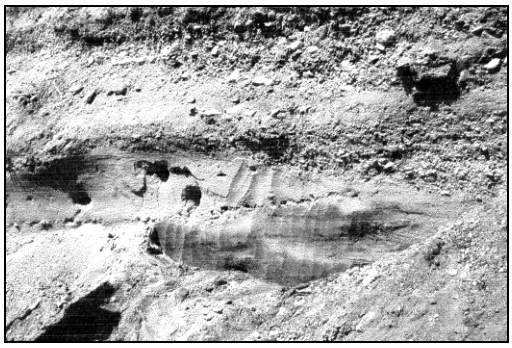

Fig. 9. The aggradation of the Olt river valley-flat during its evolution (Şercaia profile).

The aggradation forms in the fluvial, lake or slope systems can offer, as we proved in this paper, real succesfully investigation opportunities. The researches made at both the level of the river channels and of the river flats indicates overpositions of various lluvial formations as a result of the climatic factor which control the rivers hydraulic regime. In the juxtaposed profile, corresponding to the Oltului Valley (Şercaia settlement), (fig. 9) the aggradation and the way it is structured, can be easily noticed. This kind of analyses should imply joint research teams (geographers, geologists, climatologists, archaeologists etc.) which to assure an integral assessmentof the real land situations. In this paper, we tried to operate selectively and to choose entities (fluvial, lake or slope) which to reflect the best the influence of the climate on the development of accumulation landforms. We asses that the described aggradation structures can become useful instruments in the paleoclimatic chronology of the central part of Romania, which is the Transylvanian Depression.

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THE INDUSTRIAL PARKS LOCATED WITHIN SOMEŞUL MIC RIVER CORRIDOR

GR. P. POP[1], ADELA MÎRZA[2]

ABSTRACT. – The Industrial Parks located within Someşul Mic River Corridor. The necessity of rising on upper levels of industrial activities from Romania reached the conclusion of edifying new forms of organization within the mentioned field, respectively the one of **Industrial Parks**, a situation that starts to take shape as a consequence of a government ordinance from the year of 2001, establishing the whole set of facilities offered to the investors willing to proceed in favor of the implementation of industrial units with the purpose to develop high technicality products. After performing all the preparatory actions, the construction works of **TETAROM I Industrial Park** (**T**ransylvania **E**quipments and **A**dvanced **T**echnologies manufactured in **Rom**ania), officially began on February 22, 2003, and lasted until November 17, 2005, when the official opening was held. The park is located in the western part of Cluj-Napoca County, on the northern slope of Hoia Hill, between the Ethnographic Museum of Transylvania (the Outdoors Section) and Cluj-Napoca-Oradea railway, where it occupies a surface of 32 ha, the constructions being represented by a Multifunctional Hall, with space destined for offices and production facilities, as well as a Business Incubator, where there are offices, the headquarters of TETAROM S.A., a conference room, an exhibition space, multipurpose rooms and outbuilding areas, predominant activities integrated in fields such as software, electronics, telecommunications, industrial automation, IT, general services and so forth. The month of December of the year 2005 corresponded with the approval of the government investment for the purpose of accomplishing the infrastructure (of the access roads and of the utilities of operating) at a new industrial park in the municipality of Cluj-Napoca, respectively **TETAROM II**, located in the vicinity of the tram Depot at the eastern end of Muncii Boulevard, on an area of 12 ha surface, of which 11 ha have been granted, by the Cluj County Council, in January 2006, to the American Society EMERSON (found among the top 50 companies in the world) for the building of constructions destined for production (for bays), research (with 200 - 250 researchers) and of different units. As part of this activity of production, the unit produces (with approximately 1500 - 2000 employees): gas regulators, electric motors of small dimensions, appliances for the construction industry, wind turbine electric generators, and so forth. The third Industrial Park from the Somesul Mic river corridor – **TETAROM III** (with a surface of 154,526 ha) – whose building was possible, after a series of steps as far as the place of location is concerned, **Nokia Company** has chosen a space within the territory of Jucu Village (figure.1), the given situation allowing the beginning of the contract negotiations (February 1, 2007), then the signing of the contract of building a unit among the suitable parts (March 26, 2007), the opening ceremony for the site organization at TETAROM III (June 1, 2007), all these approaches allowing the official opening of **Nokia Factory**, within TETAROM III Industrial Park (February 11, 2008), the objective of the activity consisting in the production of mobile devices, equipments, solutions and services for the networks of communication. In the lower part of Someşului Mic river corridor, the **Arc Industrial Park Dej** (figure 5) is running, in which the first user – SC Trelleborg Automotive SRL–completed the investment regarding the production of anti-vibration automotive components in December 2006.

Keywords: *industrial parks,TETAROM, Arc Park, high technology,Cluj-Napoca, Jucu, Dej*

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1. INTRODUCTION

The requirements of settling the economy of Romania on new foundations, beginning even with the year of 1990, compelled the apparition of modern forms of unfolding activities in the field of industrial technology, in this matter reaching the conclusion of the necessity, in different administrative and territorial units of the country, of the **Industrial Parks**. As a consequence of the above mentioned fact, the year of 2001 corresponded with the elaboration of a *Government Ordinance*, which established the entire set of facilities offered to the investors willing to carry out the implementation of the industrial unit with the purpose of manufacturing high technology products.

Progressively, based on the above mentioned ordinance, preparations were made for the establishing of the suitable societies, able to conduct the full range of actions, to reach the final stage of the anticipated objectives, meaning the settling in place of the Industrial Parks, each with its own territorial specificity and with its own production.

In a condition of maximum generalization, must be mentioned the fact that, by the fall of the year of 2006, is reached, on the territory of Romania, to the existence of 37 industrial parks, of which a total of 23 are operational, and the remaining 14 were in various stages of achievement. The activity of building industrial parks continued in the following period as well, so that in July 2010, there were 50 industrial parks (45 operational and 5 in the process of building) all over the surface of the country.

Of the total of 50 units, 42% (21 parks) were present in Transylvania and 40% in Muntenia (20 units, of which two were in Bucharest), these geographic and historical provinces enrolling with 82% (9 industrial parks), respectively 6% (3 parks) in Moldavia, Banat and Oltenia each with 4% and Crişana and Dobrudja with 2%. The administrative- territorial division of the industrial parks on the level of the counties of Romania is quite interesting, the highest concentration, in this matter, being in Braşov Counties, with 20% (10 units) of all the 50 industrial parks and Prahova, with 18% (9 parks), these being followed by Dâmbovița with 10% (5 parks), Cluj with 8% (4), Sibiu with 6% (3) and then Bucharest Municipality and Giurgiu County, each with 4%, and the remaining counties accounting for 2% each one of them.

The Industrial Parks from Romania, at the level of the Geographical-Historical Provinces and of the Counties, on July 30, 2010 (Source: *14.07.2010 – DCLZAASPSA – The Department for Assisted Areas and State Aid)*

TRANSYLVANIA[1]

Alba County: Cugir (11,17 ha).

Braşov County: 1. Zărneşti (46,156 ha), 2. Pro-Roman (104,5 ha), 3. Euro Land Vlădeni (47,19 ha, Green field), 4. Prejmer (82,36 ha), 5. Braşov (29 ha), 6. Metrom (6,37 ha), 7. Carfil (1,87 ha), 8. Făgăraş (10,017 ha), 9. Victoria (5,50 ha, in process of building), 10. Braşov (34 ha, spreading).

Cluj County: 1. Tetarom 1, Cluj-Napoca (31,93 ha), 2. Tetarom 2, Cluj-Napoca (12 ha), 3. Tetarom 3, Jucu (154,526 ha), 4. Arc Parc, Dej (40,185 ha).

Hunedoara County: Hunedoara (20,35 ha).

Mureş County: Mureş (40,9 ha).

Sălaj County: Jibou (22 ha).

Sibiu County: 1**.** Şura Mică (98,045 ha), 2. Sibiu (95,4 ha), 3. Mediaş (14,356 ha).

BANAT[2]

Arad County: UTA 2 (14, 58 ha).

Timiş County: Anton 1 Sânandrei (42,9 ha, in process of building).

[1] *The industrial parks are lacking from Bistrița-Năsăud, Covasna and Harghita Counties.*

[2] *Lacking from Caraş-Severin County*.

CRIŞANA

Bihor County: Oradea (121,29 ha).

MARAMUREŞ[1]

MOLDOVA[2]

Botoşani County: Botoşani (12,95 ha).

Galaţi County: Galaţi (21,8 ha, in process of building).

Neamţ County: Ceahlău (10,43 ha).

DOBROGEA[3]

Constanţa County: Mangalia (13,1 ha).

MUNTENIA[4]

Argeş County: Piteşti-Bradu (14,0771 ha, in process of building).

Dâmboviţa County: 1. Moreni (24,7115 ha), 2. Mija (82,62 ha), 3. Răcari (23,686 ha), 4. Corbii Mari (22,22 ha, Green field), 5. Priboiu (31,92 ha, in process of building).

Giurgiu County: 1. Bucureşti (143 ha), 2. Giurgiu Nord (13,4 ha).

Ialomiţa County: Feteşti (20 ha, Green field).

Prahova County: 1. Prahova (23,47 ha), 2. Ploieşti (146,27 ha), 3. Brazi (64, 114 ha), 4. Mizil (30 ha, Green field), 5. Urlaţi (35,06 ha), 6. Allianso Business Park-Ariceşti (219 ha, in process of building), 7. VDP Ariceştii Rahtivani (25 ha, Green field), 8. Ciorani (45 ha, Green field), 9. Plopeni (36,47 ha).

Bucureşti Municipality: 1. Metav (16,576 ha), 2. Sema (16,268 ha).

OLTENIA[5]

Dolj County: Craiova (10,03 ha).

Gorj County: Gorj (13,91 ha).

The synthesis is known on a national level, and among the following, the fundamental geographical and economic aspects of the Industrial Parks located in **Someşul Mic River Corridor** are taken into consideration, that correspond with the territory that starts from Gilău (at an altitude of approximately 400 m) and ends at the confluence of Someşul Mare and Someşul Mic Rivers, at the altitude of 232 m, between the mentioned limits, recording a length of 75 km, where the Corridor is accompanied by the Plain of Transylvania (South), Feleac Massif (South) and the Hills of Cluj and Dej (West).

2. THE INDUSTRIAL PARKS THROUGHOUT THE RIVER CORRIDOR

Throughout the corridor that is taken into consideration, between the year of 2000 – present time, four industrial parks were built, respectively *TETAROM I, TETAROM II*, located within the inner-urban territory of Cluj-Napoca and *TETAROM III* at Jucu, and in Dej the *Arc Industrial Parc* was established, the first three being part of TETAROM S.A. Company, and the forth, positioned in the inferior side of the Someşului Mic River Corridor, represents a self-contained entity.

2. 1. TETAROM S. A. Company

The beginning of achieving the first three industial parks located within Someşului Mic River corridor (TETAROM I, TETAROM II and TETAROM III) had at their origin the action of the Cluj County Council, who, in the year of 2000, submitted to the Agency of North- West Regional Development, the project "The Development of the Western Economic Area – Industrial

[1] *Lacking from the two counties of this Geographical-Historical Province (Maramureş and Satu Mare).*
[2] *Lacking from the counties of Suceava, Iaşi, Bacău, Vaslui and Vrancea.*
[3] *Do not exist in Tulcea County.*
[4] *Lacking in Buzău, Brăila, Ilfov, Călăraşi and Teleorman Counties.*
[5] *Lacking from Mehedinţi, Olt and Vâlcea Counties.*

Park for Advanced Technologies" (PHARE Project, this allowing the accomplishing of the infrastructure of the analyzed objective), then, in November 2011, **S.C. TETAROM S.A.**, was founded in Cluj-Napoca. The name stands for the abbreviation of ***T**ransylvania **E**quipments and **A**dvanced **T**echnologies manufactured in **Rom**ania*, the main role of the company being the administration of TETAROM Industrial Parks, in accordance with CAEN Code no. 6832 – "The administration of the real estate based on a fee or on a contract", the stockholder consists of Cluj County Council and of the local councils of Cluj-Napoca, Turda, Câmpia Turzii, Dej and Gherla Municipalities and of Huedin City.

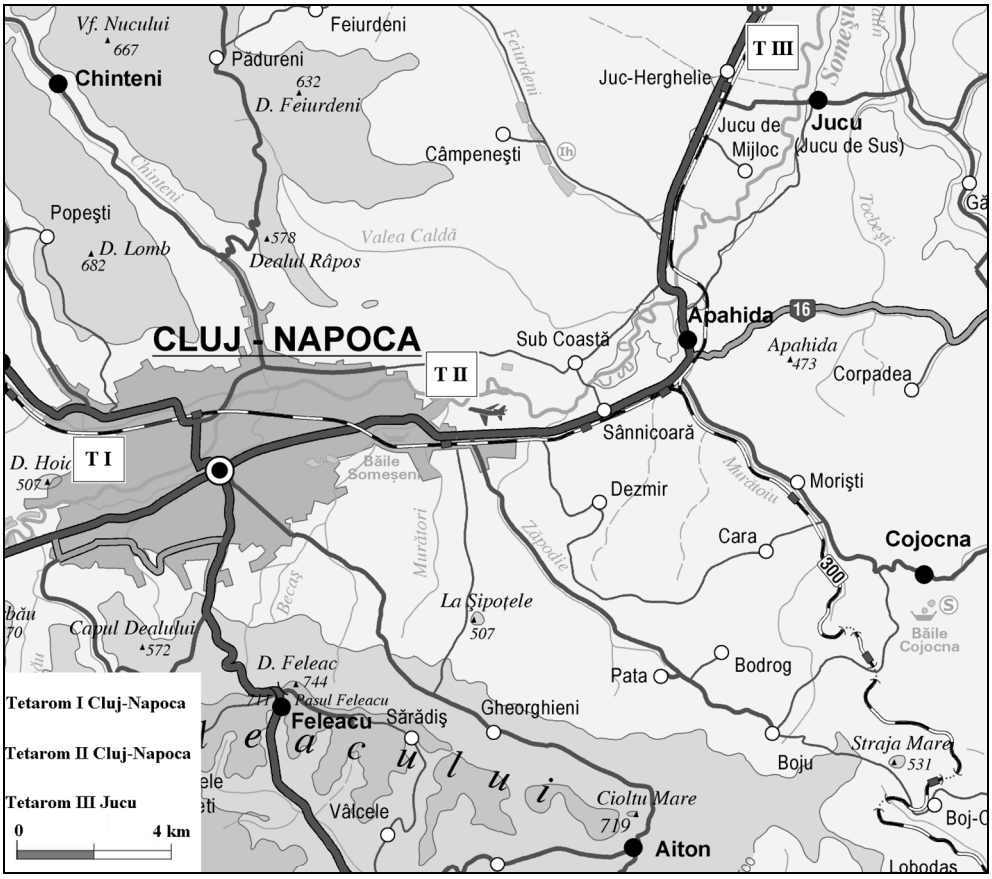

Fig. 1. Geographical position of the Industrial Parks within Someşului Mic River Corridor, Cluj-Napoca - Jucu sector .

The necessity of this approach proved to be fully justified by *"...the fact that the territory of the park was obtained by the settling of contracts of cession even before the final reception of the infrastructure"*[1]

[1] *http:cjcluj.ro/sc-tetarom-prezentare/*

It is also worth to be emphasized the fact that the objectives pursued by TETAROM S.A., from the very beginning, were:

-"To create and to develop high-technology industries, that require qualified labor force, respectively the technology of information, electronics & the industry of telecommunications, automatics, robotics;

- The stimulation of the activities of research within the field of advanced technology;

- To create new qualified jobs, in an accelerated rhythm;

-To introduce certain nonpolluting technologies in accordance with the legislation concerning the protection of the environment;

- To create infrastructures that are specific to industrial parks, local and regional engines of development."[1]

2. 1. 1. TETAROM I Industrial Park

Certainly, the action began, in the year of 2002, with the development of several preparatory operations, amongst which there are: the attribution by the County Council of the land for the future industrial park; the elaboration of the project for the achievement of the infrastructure of the park; the Ministry of Development and of Prognosis conducted, in Bucharest, the international auction for the selection of the firm that will build the park, the winner being the Austrian group from ALPINE MAYREDER BAU GMBH, the total value of the project being of 5.188.679 EUROS, of which 64,8% was provided by the European Union, 21,6% by the Government of Romania and 13,6% by the Cluj County Council; the obtaining of the first Title of **"Industrial Park"**; the increase of the social capital, and so forth.

The year of 2003 corresponded with a series of preparatory actions: the transfer of the land to the constructor of the park; respectively ALPINE MAYERDER GMBH firm, Austria, the consultant being Louis Berger Company from USA; the elaboration of the details of execution of the project; the establishing of the general designer (the firm INTERPROIECT from Cluj City) and so on, so that on February 23, 2003 took place the official inauguration of the construction works at TETAROM I Industrial Park.

As a result of solving the entire set of problems: the increase of the social capital (March 23, 2003), the expansion of the geotechnical study, due to the apparition of certain situations of instability of the land (May 2003), the proposition of ALPINE SA of other subcontractors, the request for extensions of time regarding the achieving of the construction works (April-August 2004), the signing of the first contracts of cession with several firms (December 2004), the preliminary reception of the Multifunctional Hall and of the plots belonging to profiles 0-12 (April 2005), the reception at the completion of the works and the establishing of the necessary rectifications that need to be solved (October 1-14, 2005), the signing of the final contracts of cession of the land from TETAROM I Industrial Park, the park being entirely occupied and the Multifunctional Hall fully rented (November 2005), and so forth, and on November 17, 2005, *TETAROM I Industrial Park was officially inaugurated.*

The park is located in the western part of Cluj-Napoca Municipality, on the northern slope of Hoia Hill, between the Ethnographic Museum of Transylvania (Outdoor Section) and Cluj-Napoca-Oradea railway, Taietura Tucului Street, no.47, where it covers an area of 32 ha, the infrastructure being represented through *35 plots of land*, with surfaces from 1.100 m² - 48.868 m², a *Multifunctional Hall* (P+1, with a surface of 4.900 m², of which 3.200 m², spaces

[1] *http:cjcluj.ro/sc-tetarom-prezentare/*

destined for production and 1.700 m² offices) and a *Business Incubator* (1.120 m² modern spaces destined for offices, 378 m² multifunctional space and 288 m² Tetarom SA headquarters), the entire surface of 32 ha of the park being operational, and the degree of occupation is of 100%. Regarding the geographical location of the park, should also be noted the fact that, this is located, as far as the main roads of access are concerned, the following way: 3,7 km until E60 Bucharest – Budapest – Vienna, 13,6 km to A3 Highway, then 3 km to Cluj Napoca Railway Station and 11 km from Cluj-Napoca International Airport (Someşeni).

Fig. 2. Overview of TETAROM I Industrial Park, Cluj-Napoca, Tăietura Cucului Street, no. 47.

The highly modern constructions of the infrastructure of the park are accompanied, in the most natural way, by all the utilities necessary for the conducting of a top activity, including operations of maintenance, sanitations, telephony, internet, health, customs, and banking, of logistics, public alimentation, water supply, sewerage, transportation, hotelier, sports and recreation. The park, administrated by TETAROM Society from Cluj-Napoca, where the number of employees is approximately of 1000 individuals, has as its main objectives, the supporting of the development and manufacturing of goods belonging to advanced technologies, which are nonpolluting, the main activities enrolling in fields such as: the implementation of complex software, electrical engineering, telecommunications, industrial automatization, basic chemical industry, general purpose services (trade and storage of various products, development and leasing of real estate, banks, consulting regarding technology of information, architectural and construction works, various prints, photographic activities and so forth), and so on.

With respect to the industrial activities, companies such as EnergoBit and PlantExtrakt are to be remarked. The first one entered within TETAROM I Park on December 16, 2004, and the second only on March 15, 2010.

EnergoBit SRL, located in one of the plots belonging to TETAROM I Park, is a successful and innovative business *"... which nowadays offers the complete solution regarding electricity: energy audit, consulting in programs of energetic efficiency and renewable energies, design and specialized services of origin, entrepreneurship regarding complex electrical installations, production of equipments of average and low voltage, lighting appliances, operating of power installations"* (Fl. Pop, 2011, page 37).

EnergoBit Company, with its headquarters in Cluj-Napoca, disposes of representation on a national level, with correspondent offices in Bucharest, Bacău, Braşov, Constanţa, Craiova and with units of production in Cluj-Napoca and Jibou, had, in its first phase of activity, at the unit from TETAROM I Park, the development of few *complex works of power installations*, at different units located on the territory of Romania, some of the necessary equipments being manufactured at Jibou (Sălaj County). For the increase of the degree of assurance of several of the products necessary for the works regarding installations, was already in progress in the year of 2011, at Cluj-Napoca, the building of a new hall destined for the production of electrical equipments *"that will enrich the portfolio of products manufactured and currently offered by the Group"* (idem page 38).

In order to increase the degree of independence regarding the works performed, is also noted, the following fact: *"The recent purchase by EnergoBit of the majority package of stock of ELM Electomontaj Cluj, completes the portfolio of services within the electrical-energetic field. With over 50 years of experience on the market of its profile, Electromontaj has achieved important projects, both domestically and on the international level. The company disposes of a factory of metallic confections, which provides support in the works that are performed* (ibidem, page 39).

PlantExtrakt SRL, in the process of being materialized within the Multifunctional Hall of TETAROM I Industrial Park, where it will occupy a surface of 4.000m², of which 1.200 m² will be destined for space of production, in the activity profiled on the manufacturing of certain fitopharmaceutic products where there will be working around 100 individuals. This unit represents an investment of *PlantExtrakt Factory from Rădaia* (Baciu Commune), at 14 km west from Cluj, on Nadăş Valley, DN 1F, E 81 and on Cluj-Napoca – Oradea railway)[1].

2. 1. 2. TETAROM II Industrial Park

The month of December of the year 2005 coincided with the approval of the governmental investment for the implementation of the roads of access and of the utilities of functioning of a new industrial park within the radius of Cluj-Napoca Municipality, respectively **TETAROM II,** located in the north-eastern part of this important urban centre, in the vicinity of the tram Depot from the eastern end of Muncii Boulevard (Emerson Street, No. 4), on the road found on the left side of Someşul Mic River, the mentioned geographical position registering 11,7 km up the **E60** highway (Bucharest – Cluj-Napoca – Oradea – Budapest – Vienna), 26,1 km to the segment of **A3** highway (Câmpia Turzii-Gilău), 7 km to the main railway line **300** (CFR Cluj-Napoca train station) and 4,6 km to the International Airport (Someşeni – Cluj-Napoca) (figure 1).

The park, operational and with a degree of occupancy of 100%, spreads across an area of 12 ha, of which 11 ha were granted by the Cluj County Council, in January 2006, to the EMERSON Company, the American corporate representative in Romania EMERSON ELECTRIC (amongst the first 150 industrial units in the world), who built, on the mentioned surface: *3 units of production*, where gas regulators are manufactured, tools for the industry of

[1] *http://www.plantextrakt.ro/compania.php*

constructions, professional and electrical equipments and electrical generators for wind turbines and so forth; *a research centre and an office building*, TETAROM II unit offering to the people living in Cluj, over 1.000 jobs. (Adela Mîrza, 2011, page 6).

Fig. 3. TETAROM II Industrial Park, located in the northwestern side of Cluj-Napoca Municipality, in the vicinity of the tram Depot, on Muncii Boulevard, Emerson Street, no.4 (see figure 1).

2. 1. 3. TETAROM III Industrial Park, NOKIA

The approaches, in terms of determining the location for this industrial park began since the year of 2006, in this matter, the offer and then the negotiations (December 21, 2006), taking into consideration one location from each one of the localities of Floreşti, Baciu, TETAROM I and TETAROM II and two from the territory of Jucu Commune, the given situation leading to the election, by NOKIA Company, of the field of Jucu (from the left side of Someşul Mic River Corridor), the date corresponding with the beginning of the negotiations for the contracting of the respective location (February 1, 2007).

The date of March 26, 2007, represents the moment when, in Bucharest, in the presence of the Prime-Minister of the Romanian Government, Mr. Călin Popescu-Tăriceanu, the contract with NOKIA Company was signed, contract regarding the location and building in Jucu, of the factory taken into consideration, by the following persons: Raimo Puntala, Vice President of NOKIA; Esa Matti Puputti, Vice President of NOKIA, Marius Nicoară, President of Cluj County Council and Viorel Găvrea, General Director of TETAROM SA, after which, in June 1, 2007, the opening ceremony for the site organization at TETAROM III Industrial Park, respectively NOKIA, was held.

The action of achieving TETAROM III Industrial Park continued, then, with: the opening ceremony for the organization of the site at TETAROM III (June 1, 2007); the issuing of the construction permit for NOKIA by Jucu Local Council and by Cluj County Council, and the beginning of the construction works of the park (August 1, 2007); the obtaining of TETAROM trademark registration (November 2007) and the implementation of the System of quality management, according to ISO 9001:2000 Standard, in SC TETAROM SA (January 15, 2008), and then in February 11, 2008, took place the official opening of **NOKIA** factory, within **TETAROM III Industrial Park** from Jucu, Cluj County.

Fig. 4. Overview of NOKIA Factory from Jucu, Cluj County (in the background, Someşului Mic Valley, and also a well emphasised segment of the western side of the Transylvanian Plain).

As results of the above mentioned information, the factory from Jucu began to take shape in the year of 2007, within the public-private condition of investment (Cluj County Council and various companies or societies willing to make investments for industrial activities of advanced technology), the unit being located in **Jucu** locality (Someşul Mic River Corridor, at 21 km downstream of Cluj-Napoca, on DN 1C, E 576 and railway 401 Cluj-Napoca-Dej), on a land with a surface of 154 ha, which was passed (through an Emergency Ordinance of the Romanian Government, approved by the Chamber of Deputies on June 12, 2007) from the management of the *Research and Agricultural Development Station* of the University of Agricultural Science and Veterinary Medicine of Cluj-Napoca into the administration of the *Council of Cluj County.*

As a consequence of the mentioned situation, **Nokia Corporation** (one of the largest manufacturers of mobile phones in the world), with the desire to build a specialized unit in Eastern Europe and after extensive investigations in several countries from this part of the continent, including different cities of Romania, concluded the location within TETAROM III Industrial Park, of two important units of activity of high technology, respectively *Nokia Mobile Phone Factory* and a *Research Center.*

In order to achieve both objectives, with an investment of 60 million EUROS from Nokia Corporation (in the first phase), Cluj County Council contributing, on one hand, with a land with an area of 90 ha from within the Industrial Park of Jucu (the total surface of this park

being of 154 ha), and on the other hand, with particular and governmental investments, solved the problems regarding the infrastructure of traffic and of utilities necessary to a proper functioning of the entire complex of activities. Moreover, as far as the utilities are concerned (the existence of water networks, methane gas and electricity in Someşul Mic River Corridor) is worth mentioning that these, together with the large possibilities of superior qualifications of the labor force by two of the prestigious universities from Cluj-Napoca (The Technical University and "Babeş-Bolyai" University), represented one of the determining key factors for the positioning of these two objectives at Jucu.

2. 2. Arc Industrial Park Dej

Next to the units presented above, administrated by TETAROM SA Company from Cluj-Napoca, "the fashion" of building industrial parks began to gain contours, lately, in other localities of the county as well. Amongst them, there is **Arc Industrial Park Dej (fully private property),** its first user was SC TRELLBORG AUTOMOTIVE SRL (Swedish Company), which completed the investment in December 2006, and on June 22, 2007 began its activity for the manufacturing of *anti-vibration automotive*[1] (around 70% of the products are supplied for exportation, the main clients being BMW, VW, Ford, Nissan, Dacia, Renault, and so forth).

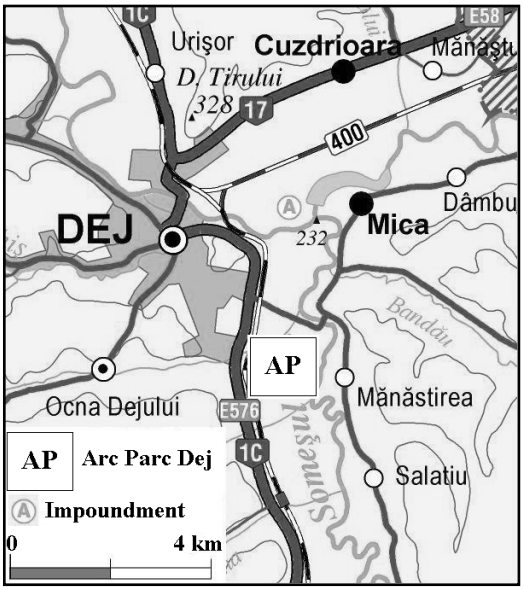

Fig. 5. Geographic position of Arc Park Dej Industrial Park (**AP**).

The unit is located in the extremity of the downstream side of Someşul Mic River Corridor (the southeast edge of the municipality, Henri Coandă Street, nr.3), on DN 1C, E 576 (towards Cluj-Napoca) and approximately 1 km from Dej train station. (Figure 5).

Disposing of a relatively large surface (40 ha, of which 2,5 ha is occupied by Trelleborg Automotive), the park offers conditions for multifunctional activities, potential investors having the possibility, of course by keeping of the requirements regarding the use of certain advanced and nonpolluting technologies, to rent or to buy plots of various dimensions in order to achieve the building of proper constructions. It is expected, the achievement, within the park, of certain products from the fields of food industry (canned fruits and vegetables, fruit juices), metallurgy (objects made out of metal), wood processing (furniture), medicinal herbs processing and so forth, as well as the creation of facilities for certain companies, in order to open working places with financial activities, postal and courier services, customs services, consulting and training, and so on. For the proper operation of the park, which disposes of a traffic infrastructure and of appropriate utilities, an administrative headquarters with offices and modern means of communication was built.

[1] *http://www.arcparc.ro/ro/despre_noi/*

3. CONCLUSIONS

Further analysis of the four industrial parks located within Someşul Mic River Corridor requires, in comparison to the ones mentioned above, few more of the issues that are specific in the case of these types of units: the evolution of the number of employees from Tetarom I, II, III parks and Arc Park Dej, the enclosing of the analyzed parks within the system of presence of the fims within the industrial parks and so forth.

Number of employees in Tetarom I, II and III Industrial Parks, during the years of 2004-2010 (figure 6)

Table 1

Parks	2004	2005	2006	2007	2008	2009	2010
Tetarom I	173	364	361	443	421	440	302
Tetarom II	0	0	4	65	238	345	700
Tetarom III	0	0	0	0	1255	1670	1495
Total	**173**	**364**	**365**	**508**	**1914**	**2455**	**2497**

As far as the evolution of the **number of employees** (table 1 and figure 6) is concerned, some more special aspects, in relation to the date when the parks became operational and to their complexity, are emphasized:

- TETAROM I Park had, in the year of 2004, a total of 173 employees, and in the following years running up to 450 and then decreasing to 302 in the year of 2010;

- The second park, TETAROM II, where one single company is unfolding its activity, respectively Emerson, which started with only 4 employees (in the year of 2006), after which their number increased rapidly up till 700 in the year of 2010;

- The third park was registered within the same unique condition of activity, meaning TETAROM III, Nokia, which began with 1255 employees (2008), reaching then to 1670 (2009) and to 1495 in the year of 2010. Tracking the frequency of the number of employees, within these three parks, in the year of 2010, highlight, by far, the position held by TETAROM III (59% of the 2.497 employees), the next place being occupied by TETAROM II (28,0%), and the third by TETAROM I (12,1%);

- The sources had close at hand[1] indicates, for Trelleborg Automotive Company (Arc Park Dej), in the year of 2010, an average number of employees of 204 individuals.

Concerning the **legality of operation and of including of the parks analyzed within the system of national and international organizations**, in a synthesis of maximum generalization, the following are to be noted:

- Depending on the period of construction and entry into service, TETAROM S.A obtained the ***Title of "Industrial Park"*** on the dates of October 11, 2002 (Tetarom I), January 20, 2006 (Tetarom II, Emerson) and April 29, 2008 (Tetarom III, Nokia);

- The date of April 14, corresponded with the unfolding of the audit for the certification of TETAROM organization according to ISO 9001:2000 Standard, after which, in April 2010, the conversion took place under the new standards, respectively ISO 9001:2008, which resulted a new certificate;

- The increasing number of industrial parks in Romania led to the necessity of the existence of a body of general coordination, on a national level, and as a result, on May 22, 2005, the *Association of Industrial Parks, Technological, Scientific and of the Bussiness Incubators from Romania (APTISIAR)* was established, and **Viorel Găvrea,** the General Director of SC. TETAROM SA, was elected as Executive Chairman.

[1] *Cotu Laurenţiu:www.zf,ro*

The pursuing of the situation of **attendance of the firms within the industrial parks** located within Someşul Mic River Corridor points out an evolution of stability in the case of TETAROM I, TETAROM II (Cluj-Napoca) and Arc Park (Dej) units, while TETAROM III, Nokia, after approximately three years of operation, reached (in the fall of the year of 2011) the conclusion of relocation from Jucu, Cluj County, to another destination, presumably and Asian one.

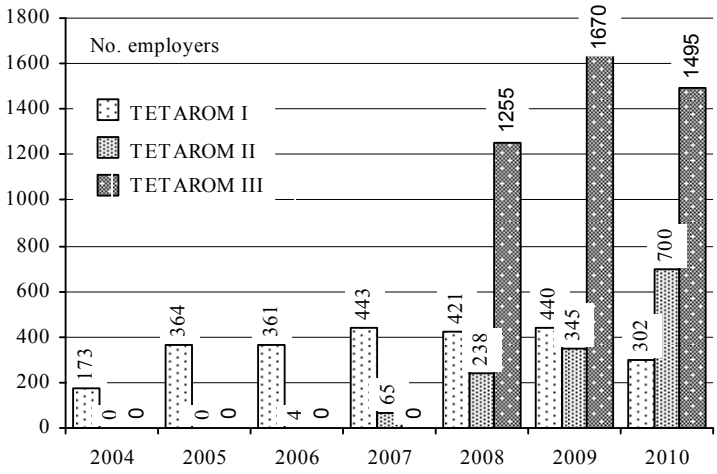

Fig. 6. The evolution of the number of employees in Tetarom I, II and III Industrial Parks, during the period of 2004-2010.

Regarding the NOKIA issue, the current situation allows to remark the fact that, it has reached to the situation when, in January 2012, Nokia Factory from Jucu was bought by the Italian Company **De'Longhi**, which will proceed, in the near future, to the proper equipping of the former Nokia halls, then to the employment of 600-1000 people and to start the manufacturing of *household appliances*, using for this purpose, components produced in Romania. Also, it should be mentioned that the board of TETAROM and Cluj County Council signed on February 17, 2012, the contract with the German company **Bosch**. In TETAROM III Industrial Park, the German company will build the necessary constructions for a unit that will produce car electrical components, covering an area of 21 ha. In order for these activities to develop, 2,000 jobs will be created during the first two years of functioning.

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STUDIA UBB GEOGRAPHIA, LVII, 1, 2012, pp. 65-70

INFLUENCE OF HUMAN ACTIVITIES UPON THE MORPHOLOGY OF "GLIMEE" DEEP-SEATED LANDSLIDES FROM TRANSYLVANIA BASIN

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ABSTRACT. – Influence of Human Activities upon the Morphology of "Glimee" Deep-seated Landslides from Transylvania Basin. "Glimee" deep-seated landslides present a specific morphology that defines them in the category of landslides. Their frequency in the Transylvanian Basin's landscape determinate the inclusion of those forms in the agricultural use, especially where the morphological characteristics of the "glimee" landslides allow it. The shape of the mounds - flattened or rounded – with a slow angle of the slopes ensure the possibility of the agricultural use for vineyards, cereals, vegetables etc. and the land is also suitable for constructions (Dâmburile, Tritenii-Hotar, Corunca etc). The influence of the human activities has not only positive effects, but also negative ones.

Keywords: *Deep-seated landslide, glimee, human activities, effect upon morphology.*

1. INTRODUCTION

"Glimee" deep-seated landslides represent a morphological characteristic of the Transylvanian Basin, especially through their morphology and dimensions. Special morphology of these landforms is an attraction for researchers interested in their genesis, their dynamics and the conditions necessary for activation or their production in the current time.

Their distribution in the Transylvanian basin in all regional units, regardless of the structural or morphological characteristics of the units, combined with the development of agriculture, led to the inclusion of the areas with glimee sliding type in the agricultural system. This has as consequence a number of positive and negative effects on the morphology of these slides.

Agricultural use of the land of the mounds and depressions (longitudinal and transversal), which are part of the landslides body, has as consequences the following: flattening the slopes mounds, determined the activation and/or reactivation of geomorphological processes and contributed to the stabilization of some of the geomorphological processes.

2. GENERAL CONTEXT

Sliding type morphology is the result of collaboration between geology, geomorphological process, climate and human activities. Natural processes tend to restore equilibrium slope towards the morphology of the slope before the actual production of the sliding process, while human intervention on the morphology of landslides is to stabilize the slope so that it is suitable for agriculture and housing location.

Affected areas with "glimee" sliding type can achieve from 1.6 ha up to 1654 ha (Zagra – 2.4, Dâmburile – 208 ha, Biia – 1136 ha, Şaeş - 1654 ha), and according to the literature "*their total area, in Romania, is more than 10 000 ha*" (Gârbacea, V, Grecu, Florina, 1981).

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The development of these phenomena on the formation of alternating permeable and impermeable layers with beds made of clay slip or marl requires careful scientific research when comes to include them in the agricultural system.

Numerous previous studies have aimed morphological analysis of areas with glimee landslides type, determination of their age and less the applied part regarding the economical potential, namely agricultural land use or location of suitable housing.

In this paper we present briefly the "glimee" sliding type morphology in order to sketch the typology of those areas lands, without going into detail, considering that specific morphology of these landforms is well known and there are several papers regarding this topic. The specific morphology of the "glimee" landslides is given by the mounds that achieve a high up 30 meters or even more, with lengths and widths of tens of meters with different forms, from elongated and flattened (Corunca, Triteni-Hotar) to the rounded ones or with a conic shape (Şoimeni, fig.1). The mounds have slopes that fall into an offset with values that go from 10-15^0 (Corunca, Dâmburile, Avrămeşti, Roşiori) up to 45^0 or even more (Şoimeni).

Fig. 1. Mounds of the glimee deep-seated landslide from Şoimeni (Cluj County).

Mounds and depressions of the "glimee" deep-seated landslides are affected by mass movement processes (landslides, creep), rainfall erosion, torrential erosion, that are leading to a sharp dynamic of the areas with "glimee". Where the geomorphologic processes actions is controlled by anthropogenic intervention, the dynamic of the glimee landslides is slow or barely noticeable (Corunca, Ranta, Saschiz etc.).

Current climate conditions provide an environment suitable for the development or reactivation of such "glimee" sliding type. This is reflected in human activities through a series of effects such as destruction of homes, closing roads, elimination of fallow land, etc.

3. RESULTS AND DISCUSSIONS

Following the analysis of cartographic documents, topographic maps (series 1962, 1980), and aerial images (2002 - 2005), we have identified several areas where the development of settlements (villages in particular) has also included areas affected by "glimee" landslides type. Although our study does not aim to achieve risk maps for places that have extended over these surfaces, we focused the analysis on the changes to morphology of the "glimee" deep-seated landslides by human activities and of those slides upon humans.

According to information extracted from literature, documents and field mapping showed that a rate of about 25% of the glimee identified by us are partly or wholly contained within the confines of settlements. We mention here that we considered for our study only the "glimee" landslides identified by us, although in the literature is given a much higher number for those landslides (over 1000 glimee for the Transylvanian Basin – Gârbacea, V., 1992).

Analyzing CORINE data from 1996 and 2000 we see a significant increase in rates for pasture, so that in 1996 they stood by a rate of only 2.1% of total area of "glimee"

landslides and in 2000 it reached 18.4%. Those differences are explained by the decline of farming in Romania and the intensifying geomorphological processes on the slopes that transformed the lands, in most cases, in badlands.

The influence of human activities upon the morphology of the "glimee" deep-seated landslides has the following consequences:

- **Accelerating the elimination of the scarp**. Slope processes are acting on the mounds and scarp with different intensities, there for in the present on the field there are "glimee" landslides whose mounds are well preserved and the scarp is strongly affected by processes of erosion, landslides, falling rocks, etc. By anthropogenic intervention, particularly through deforestation and agricultural crops along the slope, geomorphological processes are intensified. A prime example is the "glimee" landslide type from Dâmburile (Cluj County) where new landslides and the crops along the slope have eliminated the scarp of this landslide (fig.2.) so that now there is a slight slope affected by at least two successive landslides, that have affected not only the scarp of the landslide, but also the depression that was between the scarp and the mounds. This landslide's dynamic is no longer acting in favor on development, of increase in area, but tends to destroy the mounds in order to get to the shape of the hill before the slide have taken place.

Fig. 2. Scarp of the glimee deep-seated landslide from Dâmburile (Cluj County).

- **Effects upon the mounds.** This manifests itself in two opposite directions, stabilization and degradation. Mounds slopes stabilization is achieved by cultivating vineyards, orchards of fruit trees or crops made parallel to the contour of the slopes (Tritenii-Hotar, Roşiori, Avrămeşti, Şăulia-Leorinţa etc.).

By degradation of the mounds means damage or irrational land use, thereby increasing slope processes (Cornăţel - overgrazing) or by leveling them to raise construction or exploitation of material - sand, gravel, clay, marls – for various construction (Şoimeni, Corunca). An example of such degradation is the case of Corunca deep-seated landslide, where the materials from the mounds (sand, sandstone, gravel) were exploited

Fig. 3. Effects upon the mounds affected by landslide and expand of the Corunca village (Mureş County).

and afterwards the mounds were leveled and opened for constructions. Now there are several houses build on the mounds and there development continuous towards the scarp (fig.3). Human activities have positive effect upon the mounds of the landslides as long as it does not get to the stage of abandonment of the land or to over exploitation. Such case it happened with the area of Cheia deep-seated landslide where several years ago the land was used for fruit plantations and after the 90s those lands were abandoned, deforested and used for pastures. Now overgrazing of land has contributed to the intensification of the erosion process and development of new landslides that are damaging the mound and eventually the area will be a "badland" type.

- **Activation/reactivation of the "glimee" deep-seated landslides.** The necessity for more agricultural land in the 70s and 80s when this sector was well developed determined led to cultivation of land including those who were on the "glimee" slide type. Cultivation of these lands irrationally by arable crops along the slope or overgrazing, combined with periods of extreme temperatures and precipitation (1970, 1975, 2008) have resulted in activation of areas with new glimee slides type. The case of the Tăureni deep-seated landslide is an example regarding this issue. According to the cartographic documents and to the information from the field this landslide have triggered in the beginning of the 70s, with a development up to present day. In the year 2008 there were new detachments, so that new this "glimee" landslide has more mound that it had about twenty years ago (fig.4).

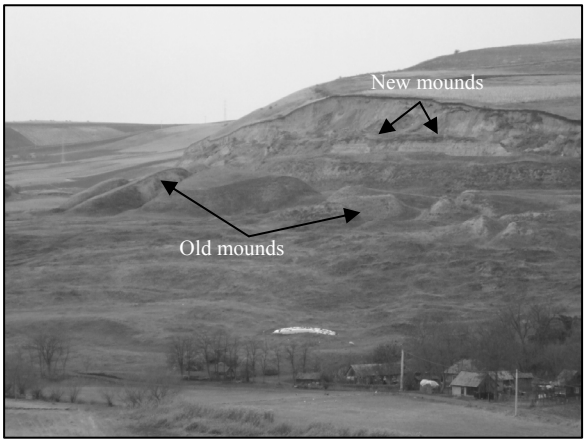

Fig. 4. The Deep-seated Landslide from Tăureni (Mureş County).

Regarding the agricultural use of the land, nowadays the arable crops are made along the slope up to the new mounds and the houses there were near the landslide area were moved to the center and eastern part of the village Tăureni. In this case there were not taken any measurements in order to stabilize the slide, maybe because it is easier to abandon "some parts" of the land, than to do something in order to stop the process development.

It is very important to highlight here the role that "glimee" deep-seated landslides play in the anthropic system. This type of landslides is less known when comes to genesis or natural conditions that favors the development of them. Thus, there are cases when the slide is still active and the infrastructure, the houses and the crops are affected. In the case of Cheia deep-seated landslide where a road was build six years ago, on the west part of the slide area, and after only four years there are craks on the it.

In other cases the geomorphological proceses that affect the mounds have negative influence upon the infrastructure. Such case is the international road E60, that near Luduş locality was in such a way affected by new landslides that is was necessary to move it from the glimee's area, over the Mures river.

This had an indirect consequence upon the river, whose course had to be change (fig.5).

In the figure 5 is seen the new road that is no longer on the hill, but in the major chanel of the Mureş river. The course of the river has sufferd the most damage, because there are some meanders that have been "cut off" fro the river.

Fig. 5. Changes done to the E60 road and Mureş River near the Luduş locality.

On the other hand, there are cases where due to the landslide characteristics thoase areas are used as a "retreat land". This happens because there are some natural factors that constrein peope to move. For example, at the Bogata locality, Mureş County, the village migrates towards the slope where the Ranta glimee is because of the river Mureş that has negative effects on the settlement especially by floods, but olso because of the river dynamic.

4. CONCLUSIONS

If we see the "glimee" deep-seated landslides as an inherited phenomena from the interglacial periods (with a Pleistocene age or from the beginning of the Holocene according to Morariu, T., Diaconeasa, B., Gârbacea, V., 1964, or even from the Eemian time, after Pendea F., 2005) we can say that the human activities that have influence upon this landslides have a negative sense because by this the morphology of the "glimee" is damaged.

Equally we can say that human influence has positive effects, one of which contribute to the triggering of new "glimee" landslides type (such as the Tăureni landslide), but this conclusion is "positive" only in a purely educational and scientific research, seen as an opportunity to study those processes from the beginning of their triggering.

From an economic perspective, the intervention of anthropogenic activities upon the morphology of "glimee" sliding type contributes to the development of agriculture and expansion of built space.

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THE NEED FOR RESERVOIR IMPROVEMENT IN VIŞEU RIVER BASIN IN ORDER TO PREVENT FLOODING, WITH MINIMAL IMPACT ON PROTECTED AREAS

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ABSTRACT. – The Need for Reservoir Improvement in Vişeu River Basin in Order to Prevent Flooding, with Minimal Impact on Protected Areas. With one of the most asymmetrical drainage basins in Romania, Vişeu represents the birth place of numerous and violent flood waves which not only cause damage for the local population but are also the root cause of numerous other similar events along the way to Tisa collector river. The total exposure of the basin has to the air masses coming in from the West side of the European continent makes it possible for large quantities of precipitation to drain off the steep side of Marmureş Mountains towards the Vişeu River, either directly or through several powerful tributaries (Ruscova, Vaser, Ţâşla, Repedea, Dragoşul). The lack of any sizeable hydrotechnical installation (permanent installations) makes limiting the damage caused by flood waves almost impossible, leading to huge damage caused annually not only along the tributaries but along Vişeu as well. Any human intervention on the basin is extremely delicate due to the fact that both Marmureş Moutains Natural Park and Rodna Moutains National Park overlap with the basin almost entirely. Both natural parks are protected areas according to the Romanian legislation. After a study, it was concluded that a hydrotechnical intervention in the basin is possible with minimal effects on the habitat but with considerable financial gains both for local and county authorities due to flood damage limitation. The overlapping of protected area layers of different restriction levels with the proposed reservoirs shows a minimal impact on the environment and outstanding hydrotechnical advantages.

Keywords*: Vişeu, flood wave, floods, protected areas, hydrotechnical instalations.*

1. INTRODUCTION

Having traumatizing effects, flood waves have been, are and will always be a menace to society. This being said, an integrated hydrotechnical installation along the rivers, with dams and reservoirs sized accordingly, offer almost total protection for the lowlands downstream, for example Someşul Mic valley (*Şerban, 2007, Şerban et al., 2010a*.).

Flooding is the result of the worst of the flood surges. Over the years there have been numerous studies, evaluations and statistics regarding how these phenomena occur but the toll floods have on humans has remained constant. The human and material cost is proving more and more difficult to bear by society, especially by the local and departmental communities which, instead of investing in development projects that would prevent flooding, have to remediate and alleviate the yearly effects these phenomena have.Vişeu basin, currently in a state of socio-economic development, is frequently affected by flood waves which cause significant damage every year, due in part to the unique geographical conditions and particularly to the asymmetry of the drainage basin (fig 1).

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The only solution for preventing and limiting damage is the hydrotechnical development of the right tributaries, Ruscova, Vaser, Ţâşla and the left ones, Repedea and Dragoşul. Due to the overlapping between Vişeu and Marmureş Mountains Natural Park and Rodna Mountains National Park this development is extremely delicate due to both Romanian and European legal environments (*Şerban et al., 2010b)*.

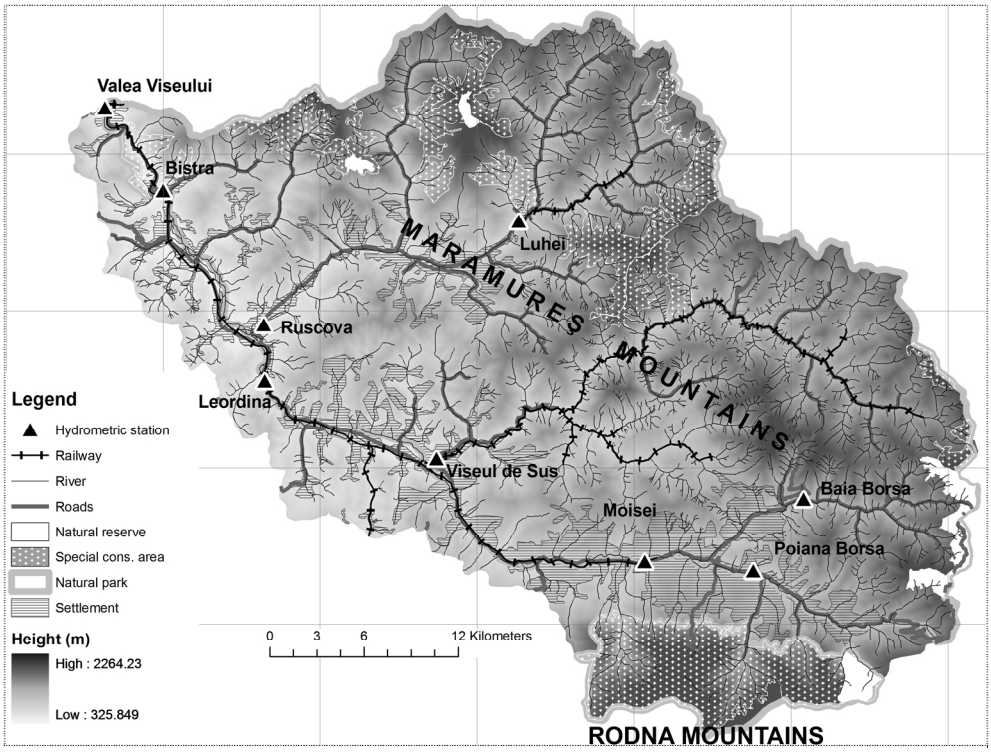

Fig. 1. Vişeu drainage basin.

This study will try to present both for and against arguments, in an effort to harmonize the human and natural habitats according to the need for protection of the human habitat and the need for conservation of the natural habitat.

2. ANALYSIS FRAMEWORK OF THE RESERVOIR OPPORTUNITY

The information used in the analysis of the main flood waves and their corresponding effects have been collected from reports created by the Someş-Tisa Water Basin Administration, including the Water Management System that administers Vişeu basin, as well as from local and county authorities present in the basin. The interval analysed is from 1968 to 2005, as well as some more recent events that caused severe damage in the area.

For cartographic support we use survey maps, plans and also satellite imagery. Any form of legal support has been gathered from the websites of specialized institutions.

2. 1. The characteristic of the main flood waves that occurred in the basin

The main cause of flood waves (61%) in Vişeu drainage basin is rainfall *(Cocuţ, 2008)*. The biggest flood wave to hit Vişeu basin occurred between the **12th and the 15th of May 1970**. The preceding period was characterized by double the rainfall compared to the multiannual average, generated by a warm and wet mass of air of Mediterranean origin that led to the formation of cumulonimbus clouds, high thermodynamic instability and water saturated soil. The amount of rainfall was between 62 mm and 120 mm (table 1).

The characteristics of the 12th and the 15th of May 1970 flood wave in Vişeu basin (according to Someş-Tisa Water Basin Administration)

Table 1

River	Hydrometric station	Flow (mc/s)		Duration (hours)		Volume (mil.m^3/s)			hp (mm)	hs (mm)	α
		maximum	basic	total	rising	total	basic	drained			
Vişeu	Poiana Borşa	62	19.2	82	21	9.098	5.668	3.43	88.1	25.593	0.29
Vişeu	Moisei	124	30.5	82	26	**17.87**	10.199	7.671	85.1	27.011	0.32
Vaser	Vişeu de Sus	257	50.5	82	29	**38.838**	16.162	22.676	115	55.307	0.48
Vişeu	Leordina	684	114	72	16	**83.419**	30.326	53.093	116	56.663	0.49
Ruscova	Luhei	124	30.5	82	26	**17.87**	10.199	7.671	109	41.5	0.38
Ruscova	Ruscova	240	50	82	27	**32.727**	15.513	17.214	110	39.7	0.36
Vişeu	Bistra	1072	182	72	13	**136.798**	54.562	82.237	113.9	53.228	0.47

hp (mm) = precipitate layer; hs (mm) = drained layer; α = draining rate

The maximum flows were between 34 and 1072 cubic meters, with occurrence probabilities that reached 1% at Leordina and Bistra and the flowed volumes had values between 2 mil cubic meters on Cosău at Fereşti and 82 mil cubic meters on Vişeu at Bistra.

Another exceptional flood wave caused by rainfall that had major effects in Vişeu basin happened between the **21st and 26th of July 1974**. The causing rainfall was between 68.8 and 109.2 mm causing a flood wave with maximum flows ranging from 42 to 651 cubic meters with a maximum probability of exceeding of 23% on Ruscova at Luhei and 3% on Vişeu at Leordina. The flowed volumes of the flood wave were between 3.24 mil cubic meters on Ruscova at Luhei and 53.5 mil cubic meters on Vişeu at Bistra.

The characteristics of the 21st and 26th of July 1974 flood wave in Vişeu basin (according to Someş-Tisa Water Basin Administration)

Table 2

River	Hydrometric station	Flow (mc/s)		Duration (hours)		Volume (mil.m^3/s)			hp (mm)	hs (mm)	α
		maximum	basic	total	rising	total	basic	drained			
Vişeu	Poiana Borşa	48.1	6.8	120	21	8.286	3.583	4.702	99.3	35.355	0.36
Ţâşla	Baia Borşa	42	3.78	120	20	**5.982**	2.739	3.243	91.8	36.9	0.4
Vişeu	Moisei	123	11.5	120	18	**12.253**	4.968	7.285	68.8	25.473	0.37
Vaser	Vişeu de Sus	192	14.8	120	23	**25.653**	8.986	16.667	109.2	40.652	0.37
Vişeu	Leordina	508	32.2	120	23	**57.9**	17.453	40.448	104.6	43.167	0.41
Ruscova	Luhei	69.3	7.63	120	18	**11.412**	5.19	6.222	85.2	33.6	0.39
Ruscova	Ruscova	134	19.2	120	23	**24.943**	11.794	13.15	81.6	30.4	0.37
Vişeu	Bistra	651	56.2	120	25	**83.634**	30.11	53.523	90.4	34.643	0.38

Between **December 23rd and December 29th 1995** there was a mixed flood wave of significant size, not only from a flow perspective but also from the perspective of the affected area. December 1995 was characterized by low temperatures and small amounts of precipitation mostly in the form of snow. The depth of the snow cover in Vişeu basin was 18cm with a water equivalent of 36 mm *(Cocuţ, 2008)*.

The rise in temperature that started on December 23rd and the increase in the amount of precipitation, first as rain and snow and then only rain since December 26th, led to the melting of the snow cover. The amount of precipitation that led to the flood wave had values between 50 and 180mm, and the maximum flows were ranging from 5.87 to 355 cubic meters per second in Vişeu basin (table 3).

The month of **November 1998** recorded a strong flood wave in the period between the **3rd and the 9th**, that impressed not only in power but in size as well. The last part of October 1998 was characterized by positive temperatures which, in the last days of the month, dropped below freezing.

The characteristics of the 23rd and 29th of December 1995 flood wave in Vişeu basin (according to Someş-Tisa Water Basin Administration)

Table 3

River	Hydrometric station	Flow (mc/s)		Duration (hours)		Volume (mil.m^3/s)			hp	hs	α
		maximum	basic	total	rising	total	basic	drained	(mm)	(mm)	
Vişeu	Poiana Borşa	20.5	1.93	158	68	5.781	1.945	3.836	72.3	28.624	0.4
Ţâşla	Baia Borşa	5.9	1.12	216	38	**2.965**	1.555	1.41	43.5	16	0.37
Vişeu	Moisei	34	2.82	192	96	**11.746**	3.47	8.277	87.8	29.143	0.33
Vaser	Vişeu de Sus	72.4	3.6	202	24	**25.176**	7.137	18.039	93	43.997	0.47
Vişeu	Leordina	224	12	130	94	**52.665**	9.547	43.118	112.5	46.017	0.41
Ruscova	Luhei	49.8	4.06	154	82	**13.284**	7.002	6.282	87.3	34	0.39
Ruscova	Ruscova	151	9.02	178	24	**42.531**	11.573	30.958	153.1	71.3	0.47
Vişeu	Bistra	355	18.7	168	26	**120.901**	29.212	91.689	127.1	59.345	0.47

At altitudes above 1000 meters, snow started to accumulate, which at Iezer Weather Station reached 22 cm, precipitation values exceeded the normal values for the month and as a result the ground became saturated with water. Starting on the 29th of October there was a significant amount of precipitation occurried which leaded to an initial flood wave and starting with November 8th more precipitation coupled with the snows water, equivalent reached values ranging from 16 to 199 mm. All this precipitation caused maximum flows between 446 cubic meter per second on Vişeu at Bistra and 9.1 on Ţâşla at Baia Borşa in Vişeu basin. The probability of exceeding the maximum flow was 2% on Ruscova at Luhei (*Cocuţ, 2008*).

The characteristics of the 3rd and the 9th of November 1998 flood wave in Vişeu basin (according to Someş-Tisa Water Basin Administration)

Table 4

River	Hydrometric station	Flow (mc/s)		Duration (hours)		Volume (mil.m^3/s)			hp (mm)	hs (mm)	α
		maximum	basic	total	rising	total	basic	drained			
Vişeu	Poiana Borşa	26.4	6.88	154	34	7.454	6.484	0.97	16.3	7.24	0.44
Ţâşla	Baia Borşa	9.1	3.02	168	48	**3.218**	1.826	1.391	52.5	15.8	0.3
Vişeu	Moisei	42.9	10	178	60	**15.479**	10.894	4.585	40.1	16.1	0.4
Vaser	Vişeu de Sus	61.3	8.6	130	24	**12.291**	4.407	7.885	40	19.2	0.48
Vişeu	Leordina	156	45.6	144	48	**44.168**	26.003	18.165	46.7	19.4	0.42
Ruscova	Luhei	250	20	98	34	**33.466**	11.642	21.823	199.2	118	0.59
Ruscova	Ruscova	307	24.1	168	30	**51.076**	19.127	31.949	152.8	73.6	0.48
Vişeu	Bistra	446	89.6	168	34	**113.917**	54.19	59.727	80.5	38.7	0.48

In **the first half of March 2001,** a particularly powerful flood wave was recorded, second only to the one in 1970. The snowfall recorded in Baia Borşa was 34.4 mm. The new layer of snow had an average depth of 20 cm throughout the basin which at the end of the time frame represented a total water value of 91 mil cubic meters stored in Vişeu basin as snow.

The characteristics of the March 2001 flood wave in Vişeu basin (according to Someş-Tisa Water Basin Administration)

Table 5

River	Hydrometric station	Flow (mc/s)		Duration (hours)		Volume (mil.m^3/s)			hp (mm)	hs (iun)	α
		maximum	basic	total	rising	total	basic	drained			
Vişeu	Poiana Borşa	53.6	1.73	103	58	9.131	2.759	6.372	118	48.6	0.41
Ţâşla	Baia Borşa	14	0.525	86	59	**2.61**	1.08	1.53	110	23.8	0.22
Vişeu	Moisei	80	4.42	104	61	**13.86**	4.54	9.32	117	33.3	0.28
Vaser	Vişeu de Sus	280	2.46	103	61	**42.84**	10.44	32.4	169	80	0.47
Vişeu	Leordina	411	8.48	103	62	**68.4**	18	50.4	140	54.2	0.39
Ruscova	Luhei	181	2.45	84	59	**18.071**	1.905	16.166	230	118	0.51
Ruscova	Ruscova	417	7.17	86	61	**53.424**	13.464	39.96	198	92.1	0.47
Vişeu	Bstra	902	21	110	53	**146.644**	30.492	116.152	192	75.2	0.39

On **July 26th 2008**, as a result of heavy rainfall, a powerful flood wave was generated and the narrow gauge railway, that provided the only means of accessing the picturesque Vaser Valley, was destroyed. (fig. 2).

Fig. 2. The effects of flood wave in Vaser Valley, July 2008
(Source: http://www.muntiimaramuresului.ro)

The narrow logging railway was rendered useless after first estimates showed that it was damaged for more than 30% of its length. The bridges at Novăţ, Podul Roşu and Novicior were destroyed along with some other smaller bridges. Some 192 tourists were stranded between Făina and Bardău and had to be rescued by helicopter or they had to walk down the valley.

2. 2. The effects of flood waves in Vişeu basin

The impact of flooding is diverse and extremely harmful for society and the environment: it can lead to water borne diseases, surface water pollution as well as the pollution of underground water, it destroys the fauna and the flora of the rivers, it destroys cultivated land and last but not least it ruins families and causes loss of life.

It is a given that in periods of flood educational and cultural activities grind to a halt, either because the population is involved in the recovery process or because schools and cultural venues have been destroyed. The effects of such interruptions can be long lasting and hard to recover from.

Table 6 shows the damage caused by the floods that occurred between 1995 and 2005. The indirect damage is reflected in the lack of electricity, in the drinking water, as well as in the inability to cultivate damaged land (almost 5000 ha - *Cocuţ, 2008*).

Damages of the great floods between 1995-2005 (according to Someş-Tisa Water Basin Administration)

Table 6

Flood wave	Victims (nr.)	Animals (nr.)	Houses (nr.)		Household annexes (nr.)	Agricultural land (ha)	Street network. (km)	Roads (km)		Bridges (nr.)	Econ. objectives (nr.)	Total Value ($)
			damaged	destroyed				local	county			
1995 December	-	-	91	-	261	1069.85		48.56	0.1	16	5	**180.629**
1995 November	-	-	190	-	209	-	1.12	13	1.3	51	5	**2.795.189**
2000 March	-	-	-	-	1133	-	-	40.1	27	15	2	**374.579**
2000 April	-	-	-	-	-	1723	-	15.97	-	26	3	**779.151**
2001 May	-	90	367	18	475	2181.5	9225	1.5	2245	211	-	**849.317**
Total	**-**	**90**	**648**	**18**	**2078**	**4974.35**	**93.38**	**119.13**	**26.55**	**319**	**15**	**6.633.363**

2. 3. Protected Areas in Vişeu drainage basin

Within the Vişeu basin there are 2 protected areas of national importance: The Marmureş Mountains Natural Park and the Rodna Mountains National Park (fig. 1).

In *Rodna Mountains* there was designated a protected area in 1932, when through The Journal of the Ministry's Council no. 1949/1932, reconfirmed by the Law no. 137/1995, the Pietrosul Rodna Scientific Reservation was created (182 ha). In 1979 this reservation was designated a Biosphere Reservation under the Man and the Biospheres-Paris program sponsored by UNESCO. On this nucleus, through Law no. 5/2000, Rodna Mountains National Park was founded, which is a protected natural area of national and international importance, and which, according to the I.U.C.N. classification, belongs to the second category - National Park - Biosphere Reservation, SIT NATURA 2000 (SCI and SPA).

Rodna National Park is the largest protected area in the northern part of the Eastern Carpathians, covering a total of 46339 ha. The importance of the area is due to its geology and geomorphology, and to the fauna and the flora that are found within.

The Ministry for Environment and Durable Development, which is in charge of safekeeping Romania's protected areas, entrusted the management of the area to ROMSILVA for a period of 10 years. As a result of the management contract no. 732/22.05.2004, the Rodna Mountain National Park management office was set up headquartered in Rodna, Bistriţa-Năsăud County.

Marmureş Mountains Natural Park is situated in the North of Maramureş County, covering the areas surrounding Borşa, Moisei, Vişeu de Sus, Vişeu de Jos, Leordina, Ruscova, Repedea, Poienile de Sub Munte, Petrova and Bistra, including the Marmureş Mountains all the way to the border with Ukraine. The borders of the area were established by governmental decree H.G 2151/2004. It also includes a number of multipurpose areas of land, and it is divided amongst several Forestry Service local offices such as Borşa, Vişeu, Ruscova and Poienile de Sub Munte. As a result, the below references take into consideration markings and infrastructure points from the area.

2. 4. Legislative framework specific to territories that include protected areas

The coexistence of protected areas and hydrotechnical infrastructure is well known and it currently exists in Romania without having major repercussions on the landscape or on the natural environment (for example, Apuseni Natural Park - *Şerban, 2007, Şerban & Touchart, 2008*).

The current legal framework allows, under special conditions, human intervention in natural parks. According to Art. 3, paragraph 5 g) of H.G. 2151/2004, the intervention in natural parks is permitted in order to prevent natural disasters (*Şerban et al., 2010b)*.

We will not particularly insist on this subchapter, since the issue has been analyzed in detail in the above mentioned paper, which was published in the volume of an anniversary national conference for experts in the field.

3. METHODS EMPLOYED

In the analysis of the statistical data we employed both classical and computerized methods, which allowed the classification, centralization and elaboration of some graphical components, as well as some tables that exemplify the dynamic of the phenomena described. (Microsoft Office Excel, SPSS, CurveExpert etc.)

In the building of the digital mapping components, we used specialized software, frequently used in practical hydrology and specialized studies, which were available at the institutions where the authors are currently employed or studying at. (ArcView, ArcGIS/ArcInfo, EMS, SMS & WMS etc.)

4. THE RESULTS OF THE STUDY

4. 1. Technical possibilities for developing the basin

There are some plans used when needed by the County Committee for Emergency Situation and the DESWAT program that prevent and combat flooding. The structural means of protection are comprised of improvements to the river bed and dike building. No hydrotechnical work is being done to diminish the impact of flood wave (permanent or temporary reservoirs), and the reforestation is lacking.

The most effective installations on Vişeu River are the complex hydrotechnical instalations meaning dams and large reservoirs *(Sofronie, 2000)*. The area provides a huge hydro electrical potential because of the steep slopes with numerous water falls *(Haidu, 1993)*.

The best suited would be the right side tributaries Ruscova, vaser and Tasla as well as the left side tributaries from the northern slope of the Rodna Mountains, Repedea and Dragoşul (table 7). The only significant inconveniences would be the fact that the lake's area would partially overlap with protected habitats, and a certain disturbance to the fauna for the duration of the construction (fig. 3).

4. 2. Advantages and disadvantages of the basin development

In table 8 there is a parallel between the advantages and disadvantages of reservoirs to attenuate the flood waves.

Analyzing all the advantages and disadvantages, we can conclude that reservoirs are the preferred solution, and that they should be replaced with other solutions only if local conditions make the construction of such reservoirs impossible either physically or financially.

4. 3. A minimal impact on the natural environment

There is an insignificant change in the *microclimate*. Installations where huge reservoirs have been created have had no major impact on the microclimate.

Surface and volume parameters of the proposed reservoirs

Table 7

Reservoir	Maximum level of retention (m-BS)	Surface area (ha)	Real surface (ha)	Volume (mil. m^3)	Historical flood wave maximum volume (m^3)
Ruscova	732	1925324	2125365	57586124	53424000
Vaser	880	1785605	1919849	48742859	42840000
Ţâşla	950	863715	933452	25245012	5982000
Repedea	952	388172	475488	16623409	-
Dragoşu	892	536521	609828	28530237	-

To alleviate the impact of deforestations, a program of reforestation in the areas surrounding the installation should be put in place. Rare and *endangered plants* that are in the area of the installation should be moved, and special biological areas should be identified and carefully monitored.

To lessen the impact on the *fauna*, poaching must be eradicated. Moreover, loud noises ought to be limited during the deer mating season, and also during birds' nesting season.

Furthermore, animals should be removed from the area that will be covered by the reservoir, paying special attention to the rare species. In order to limit the impact on the fish population, and to protect certain species, special conditions have to be put in place, such as canals around the lake.

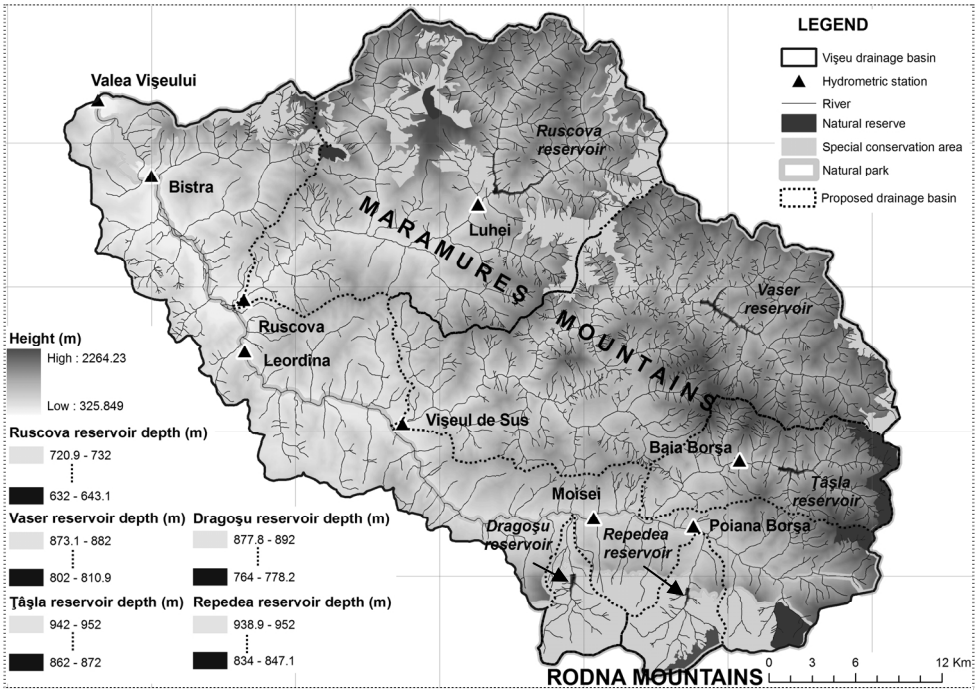

Fig. 3. Location of the proposed reservoirs vs. the protected areas.

As far as the *social acceptance* of the project goes, a special PR campaign would have to be launched, to convince the population to accept the hytechnical installation. This would involve printing posters and leaflets, handing out printed material with details of the projects, and holding conferences that present the advantages and disadvantages of the project.

Advantages and disadvantages of the proposed reservoirs and their characteristics

Table 8

Advantages	Disadvantages
When acting to reduce peaks in flow volume a rebalancing of the water resources is achieved.	Reservoirs and dams include higher costs and require a larger investment.
Reservoirs act on the entire spectrum of flood waves and are just as effective against the frequent ones as they are against the rare ones.	
Reservoirs offer a general solution to flooding and the benefits can be seen far downstream.	Dam building is more complex and more technically challenging than any other flood prevention solution.
On rivers in narrow valleys, like Vişeu, reservoirs are more economical than dikes.	
Reservoirs do not cause larger flooding downstream like dikes do.	
Reservoirs allow a better use of the land surrounding the river eliminating the idle land.	In case of a dam failure the damage is much higher than in the case of any other flood prevention solution.
The risk of an overflowing or a dam breaking is lower than a dike breaking.	
Reservoirs can have other multiple uses, the flood wave stopping one being a secondary	

5. CONCLUSIONS

The coexistence of hydrotechnical installations and protected natural areas is possible as long as the advantages are substantial and the negative impacts are minimal. The people and the local authorities need to be aware of the importance of such installations, especially in high risk areas like the Vişeu basin.

It is obvious that the construction of the hydrotechnical installations would have some negative impact on the two natural parks, but through careful studies and using the latest building techniques, these negative impacts will be greatly reduced. The socio-economic benefits of these installations are considerable, and the local communities and departments would no longer have to spend money on flood cleanups.

A plus to this solution is that the local infrastructure would be brought up to date, which could increase the flow of tourists, and the extra income can be used to fund nature conservation projects and durable development projects.

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STUDIA UBB GEOGRAPHIA, LVII, 1, 2012, pp. 81-88

REMOTE SENSING AND GIS FOR THE FOREST STRUCTURE ASSESSMENT AT THE SMALL BASINS' LEVEL IN THE APUSENI NATURAL PARK

I. HAIDU[1], G. COSTEA[2]

ABSTRACT. – Remote Sensing and GIS for the Forest Structure Assessment at the Small Basins' Level in the Apuseni Natural Park. Land use is an important element when dealing with matters related to solid or liquid flow. The changes registered in the land use can be correlated with the results of balance equations for many small basins. Although these changes are characteristic for the built areas, they are specific to the areas where changes in vegetation structure occurred due to deforestation. Taking into account the environmental factors and other elements that the Apuseni Natural Park promotes (social, landscape, etc.) we were able to highlight, through the use of the new monitoring, analysis and calculation techniques available, the manner in which the forest structure in the park is evolving, at the small watersheds' level. By the use of remote sensing we obtained data for the 1988-2008 land use structure. The resulted data was used as a starting point in the process of developing a GIS model that can deliver data regarding the evolution in the changes at the level of the small watersheds inside the park. This model takes into account both facets of the change process a forest can undergo: afforestation (forest growth over time) and deforestation. Thus, the results obtained have an important significance in establishing the effect of deforestation upon flash-flood formation.

Keywords: *Deforestation, water balance equation, Apuseni Natural Park, Remote sensing, GIS model, small watersheds.*

1. INTRODUCTION

Small basins located in the mountainous area are most likely to have high slopes presenting a high torrential degree. These basins have a high energy of the relief as well as aggressive rainfall patterns that combine and contribute to the run-off formation. Most of these basins are covered by wooden vegetation, which is a part of the forestry fund (O. Iacobescu, 2000).

Forest is one of the shields involved in the interaction process between Earth and water. Deforestation has a negative influence over the runoff. Forests slow down the torrents by diminishing their force, playing therefore an important role in the hydrological cycle. Precipitation water is stored in different manner in the forested areas as compared to dry or almost barren ones. There is no efficient method, mysterious or magical, that allows a total control over the force of water flow (F.A.O., 1967).

The forest, "inadvertently" shares together with the soil, the amount of fallen water storing a part of it in the canopy, another being absorbed by trees and other being eliminated

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through perspiration, etc. Therefore we can infer that in those places where no forest exists, together with certain geomorphological conditions, massive water accumulation is favorable, increasing the flash-flood risk (M. Domnița et al. 2010).

The purpose of the present study, namely the forestry pattern development at the level of small basins, is a topic that can bring reinforcements to the fact that deforestation, most of times practiced at a massive scale, has a large influence over the flash-flood formation.

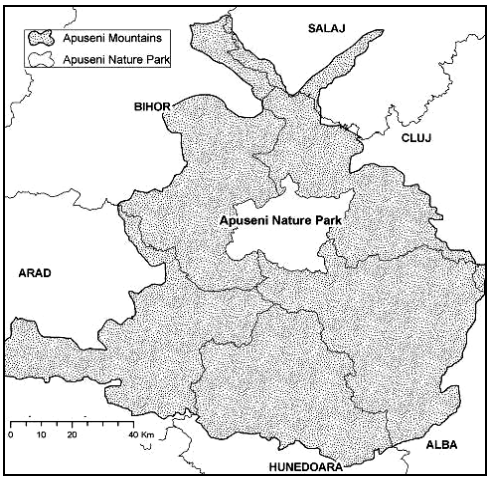

Fig. 1. The localisation of Apuseni Natural Park.

The flash- floods resulted from the water runoff processes reported in the basins of the Apuseni Mountains, led to the choosing of this area for the present study. So that the results of the research topic have a greater importance, the study area was widened in order to match the borders of the Apuseni Natural Park. In this way, the conclusions and results can be given a local character. Located in the heart of Transylvania (Western Romania), at an altitude ranging from 300 to 1800m, the Apuseni Natural Park (approximately 76 000 hectares) constitutes a very interesting subject in what regards the hydrological studies, but also for the social characteristics in the area, its landscape, vegetation and fauna (fig. 1).

2. MATERIALS AND METHODS

To evaluate the changes of the forest patterns at the level of the small basins inside the Apuseni Natural Park, several steps had to be followed, namely: by the means of remote sensing the surfaces covered by forest were delimitated, and by using GIS modeling and statistical calculation the pattern assessment of the forest located in the small watersheds was achieved.

2. 1. The remote sensing algorithm employed for the forest area surface calculation

The Landsat 5 and Landsat 7 images captured by the Landsat TM (Thematic Mapper) and ETM+ (Enhanced Thematic Mapper Plus) sensors were used in the process of establishing the land use in the area and particularly the identification of forest areas.

The Thematic Mapper sensor (TM) is an advanced multispectral scanning sensor designed to produce high resolution images. Data coming from this sensor are given simultaneously and transmitted in 7 spectral bands. Bands 1-5 and 7 are images with spatial resolution of 30 m and band 6 is a band with a resolution of 120m (thermal infrared). The ETM+ sensor produces high resolution images as well, which, in addition to the 7-band of the Landsat TM, produces another panchromatic band, band 8 with a 15 m resolution. The thermal infrared resolution is one improved as well, being one of 60m. Using these image sources, a study was conducted for the period 1988-2008. All the images used were taken between July and August, during the luxuriant vegetation period. The images used are of "Level 1" type, meaning that they undergone radiometric and geometric corrections.

Choosing the best band combination to achieve the best possible interpretation of details in the field was the next step. The best band combination is considered the 4-5-3. Since vegetation reflects a lot of light in the near infrared band (band 4, NIR) and the water absorbs almost the entire quantity of light, the contrast between geographical entities leads to a very good distinction of the land / water interface (biodiversityinformatics.amnh.org). Band 5 (Swire, Mid-IR) is a band sensitive to the changes in water content and those in the deciduous vegetation or soil moisture (www.gdsc.nl).

The 4-5-3 combination results in an image clearer than combination 4-3-2 as the bands belonging to the visible spectrum are less (only band 3 – Red exists), hence the recorded blur effect in the false color mode 4-5-3 compared with true color mode (3-2-1) or false color (4-3-2), is lower. It can be observed that the different types of vegetation are much better defined which represents a great benefit for classification.

This band combination emphasizes the phenomenon of light absorption in the infrared wavelength. As a result of the band combination, vegetation with high capacity of light absorption, like forests for example, isolated stands and water bodies with high content are much more emphasized and their differentiation from small vegetation is easier done. In this combination the vegetation appears under the form of red shades. It is noted that where vegetation is abundant and well developed (the forest areas), the color is darker due to the high water content in these elements. When the water content decreases, the band 5 has a larger contribution in the combination, determining lighter colors in the image (band 5 was placed in green filter). Green will be more visible when the vegetation reflects less in NIR (band 4) and more in SWIR (Band 5), as for example in the case of the several types of crops. Uncultivated land types or barren land as well as the inhabited areas will be identifies in shades of blue turning grey (as the 3-Red band is placed in the blue filter, emphasizing the gap between ground and vegetation, which is more visible due to the presence of chlorophyll in the leaves) (www.gdsc.nl). Water appears as dark blue to black.

As a classification algorithm, and by having an extended knowledge over the studied area, the supervised classification using ENVI software will be run. By the means of supervised classification, the user can establish a number of classes of his/hers choice and generates the areas of interest for the study. Unsupervised classification doesn't offer this type of possibilities.

Thus, four distinct classes have been chosen for the present study: forest; water surface (water); soil with vegetation (herb); soil without vegetation (soil).

Applying the supervised classification algorithm for each set of images three raster files were obtained, where each represented pixel value is corresponding to land use forms previously defined. An example regarding the park land use structure is the situation from fig. 2, which represents park status in 2008.

2. 2. Forest structure Spatial Analysis at the small watersheds level inside the Apuseni Natural Park area - A GIS model

To achieve the intended purpose of this study we went to the next step, and namely integrating into a GIS database of the results previously obtained classifications. Hence, the obtained raster images were exported to ArcGIS were we extracted the park area covered by forest. The result was obtained under the form of three raster files. An example regarding the forest cover over the Apuseni Natural Park it is showed in fig. 3.

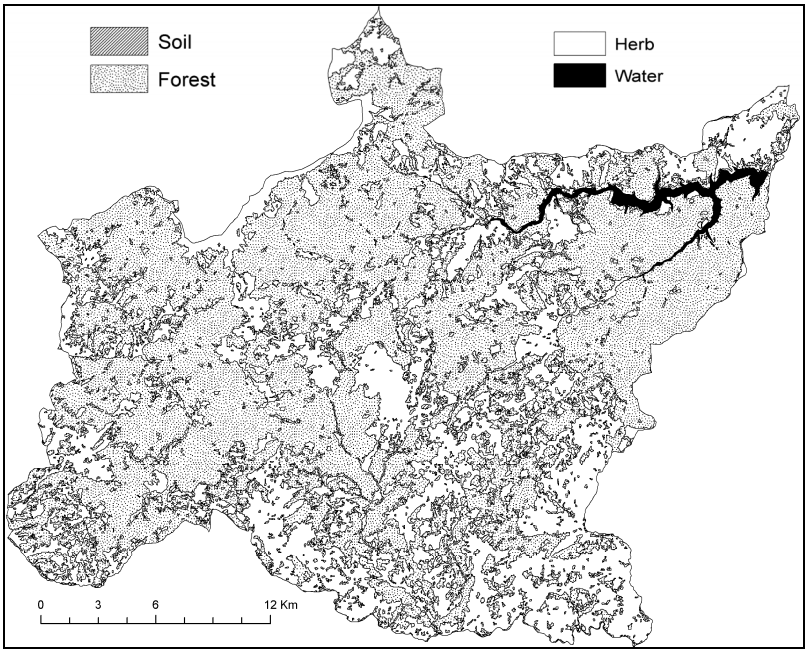

Fig. 2. "Maximum Likelihood" supervised classification method result Land use structure in 2008.

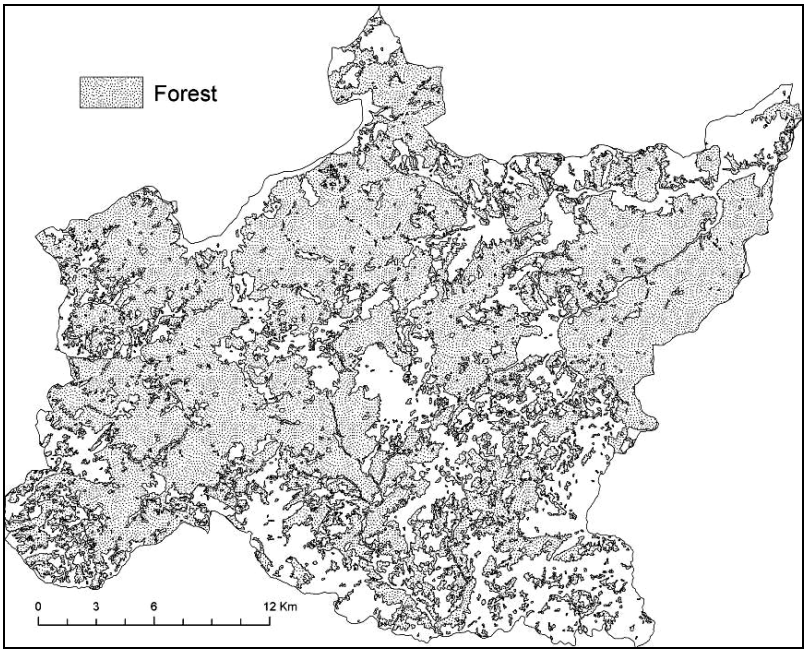

Fig. 3. Forested area in the Apuseni Natural Park in 2008 - raster file.

In order to structure the parks' surface according to the existing small watersheds, ASTER data was used (20m spatial resolution). This type of data led to the processing of the DEM. The use of the ArcHydro extension led to the vector structure (polygon) of the small watersheds (areas under 5 km^2) to be created (fig. 4).

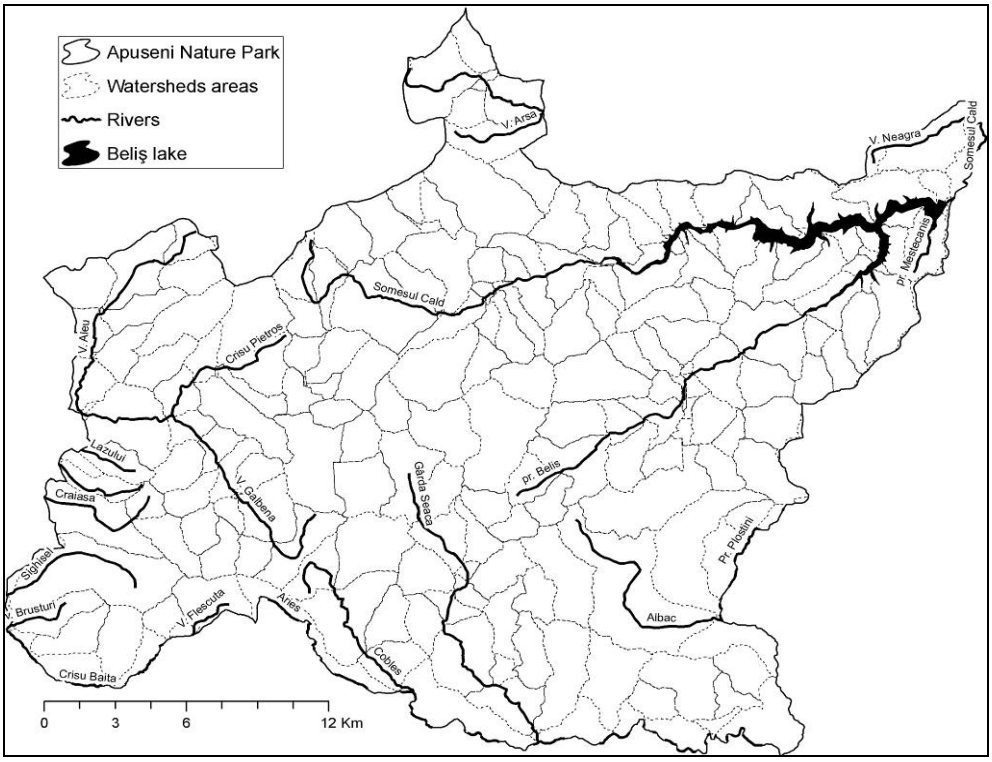

Fig. 4. The small watersheds areas from the Apuseni Natural Park.

A first analysis of forest pattern in the park was made for the a 12 year period (1988-2000). This period should be taken into account when interpreting the data obtained from the classification as there may appear positive results due to the stand existing in 1988 which could have spread in the 12 year period. The stand areas weren't detected unfortunately, as in 1988 the stand vegetation wasn't as lush as to allow its identification on satellite images. Such changes are considered as positive, while those resulting from deforestation are perceived as negative changes. The same principle was applied for the 2000-2008 period as well.

The Raster Calculator tool from the Spatial Analyst extension of the ArcGIS software was used in order to determine the degree of the forest fund evolution between 1988-2008. The result consists in raster data types displaying the values belonging to these changes (fig. 5).

Using this data the structure and evolution of small watershed during 1988-2008 was studied. The study implied the use of the ArcGIS software in order to build a computational model, integrated in ArcToolbox as a standalone tool. This model uses as input the vector layer corresponding to the small watersheds and the raster data previously obtained.

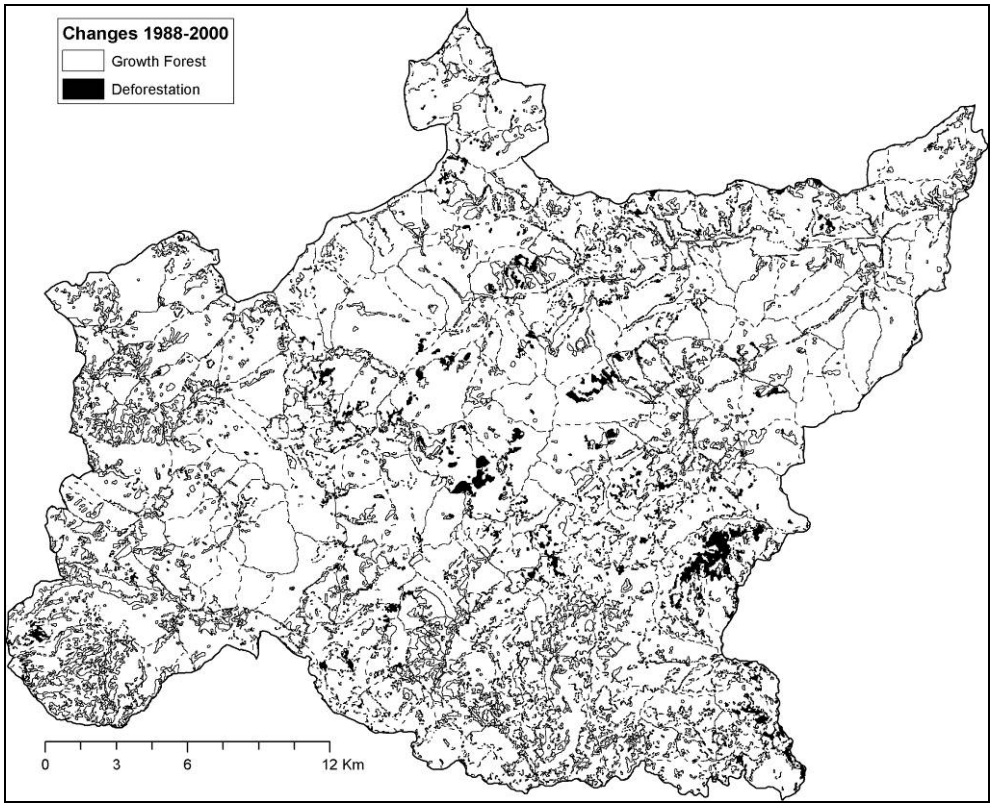

Fig. 5. Spatial changes of the forested structure in the Apuseni Natural Park from 1988 to 2000.

The GIS model, based on the spatial analysis done with Zonal Statistics (an ArcGIS extension) that takes into account simultaneously 2 values of a raster with a single band, which performs joins of data and calculations for each period introduced.

3. RESULTS

The application of all the afore mentioned steps and the use of the GIS integrated calculation model, led to the obtaining of data that facilitate an easier interpretation of the forest structure at the level of each watershed.

Following the interpretation of results we could represent as graphic the structure of forested area coresponding to the small watersheds from the Apuseni Natural Park for the studied period.

Fig. 6 is graphically representing the evolution of the park for the period 1988-2008. Similar maps were made for the periods 1988-2000 and 2000-2008 respectively.

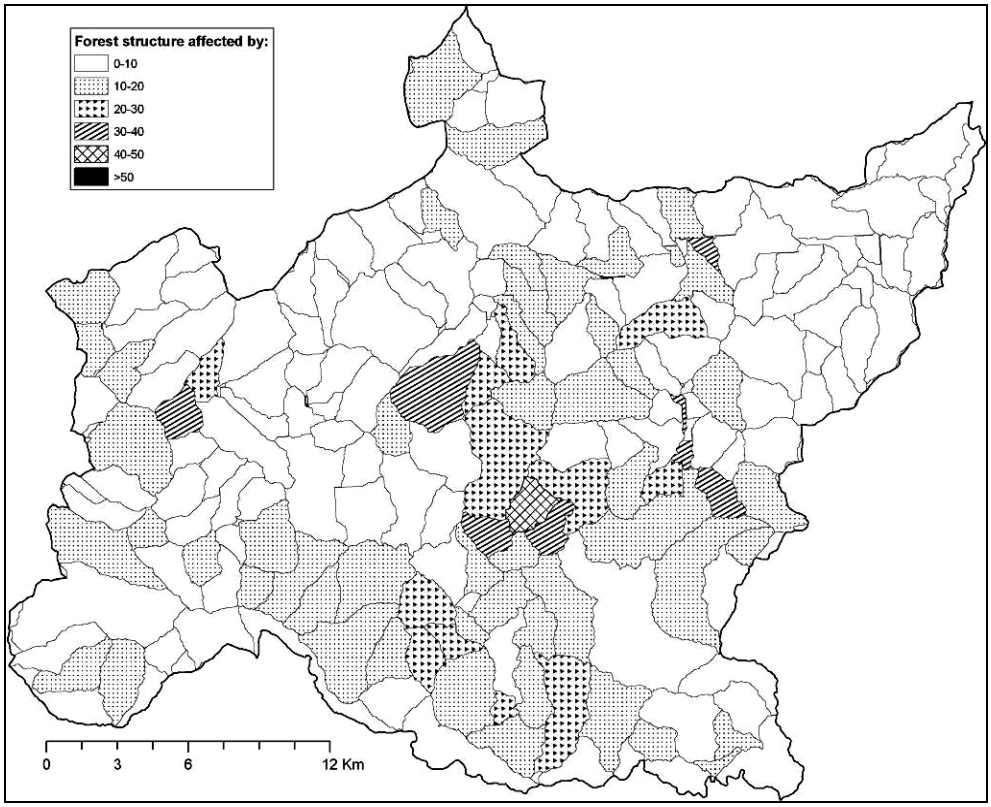

Fig. 6. Evolution of the forest structure coresponding to Apuseni Natural Park small watersheds for the period 1988-2008.

4. CONCLUSIONS

The present study has as purpose the local-scale assessment of the evolution registered in forested areas covering the small watersheds of the Apuseni Natural Park. In addition it tries to highlight the methods that can be used in order to achieve such an assessment.

By interpreting the results, for the 1988-2000 period, the forested cover in the small basins from the Apuseni Natural Park has not changed significantly, and the pattern suggests a cohesive forest structure, with small variations occurring in the highly populated areas, namely on the banks of the Albac and Beliş rivers (the SE of the park area), where deforestation reached here 15-16%.

The 2000-2008 period represented high interest for the authors of the presents study due to several reasons. The main reason was the report of several flash-floods that occurred after the year 2000. The second reason would be the returning of the forestry fund parcels to the presumed rightfully owners, as new laws have been passed regarding this matter. During this

time period, nevertheless, the patterns of the forested areas in the small watersheds have undergone massive deforestation. Hence, on the Beliş River, deforestation registered about 50% and on the other watersheds (the sub watersheds located in the West of the Park area, on the Crişul Pietros River, as well as those in the East and Center of the Park, in between the Albac River and the outlet of the Someşul Cald River at the Beliş Lake) major differences have been registered as compared to the 1988-200 period. This factor led to the apparition of the frequent floods registered since 2000. Furthermore it shows as well that the decision of giving certain rights to "old owners" over the forest stands is not a very good one.

The study over the period of 1988-2008 is justified, as it will reveal more accurately those watersheds that are facing problems in what regards the forested area pattern. It was found that in certain small watersheds, the forest structure was changed up to 50 %, sometimes 80% even (the case of the Beliş river, at the center of the Apuseni Natural Park) (fig. 6). As shown, the data the study based itself, is up to date. Therefore the results regarding the evolution of the forest structure in the small basins from the Apuseni Natural Park, become more useful and of real interest.

Land use changes, especially when dealing with deforestation, are important from the hydrologic perspective when they lead to an increase or to a decrease of the solid and liquid flow (O. Iacobescu, 2000). Although these changes are characteristically to the built areas, they are also specific to the areas affected by deforestation, especially when land use changes in the river basins having a high energy of the relief. The increase of the deforested area has the same resulting effect in this case, less obvious maybe, but very significant for the runoff process.

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THE STRUCTURE OF THE FORESTS FROM BÂRGĂU MOUNTAINS

C. COSTEA[1]

ABSTRACT. – The Structure of the Forests from Bârgău Mountains. The forest, as an exceptional value integrated part of the environment, can be analyzed starting from more than one structural criterion. The present study aims to highlight some aspects connected to the forest vegetation from Bârgău Mountains. Thus, from a structural perspective, we have engaged in an analysis of the forests taking into consideration the species, the age classes, the management and the functional groups. The qualitative analysis of the forest vegetation from Bârgău mountain space was made possible by the statistical data put forward by the Forestry and Forest Products Research Institute. The conclusions drawn at the end of the study focus on the SWOT analysis of the forests of Bârgău Mountains. The purpose of this analysis was the identification of the positive and the negative aspects of this essential component of the landscape and of the economy of the mountain unit. In addition, multiple possibilities of development of the forest economy have been emphasized. They took into account the principles of the long-term development and also the hazards that threaten the forests from this mountain space at the turn of the 3rd millennium.

Keywords: *the structure of the forest, functional classes, production classes, manner of administration, SWOT analysis.*

1. INTRODUCTION

Situated in the central-Northern part of Romania, on the Western façade of the Eastern Carpathians, Bârgău Mountains represent a mountain space of medium and low altitude, flanked by two high altitude mountain ranges, Rodna and Călimani Mountains. Towards the West and East, there are two low depressionary areas, the Transylvanian and Dorna Depression.

According to the features and the territorial distribution of the vegetation, Bârgău Mountains belong to the area of interference of the beech nemoral and mixed forests with the boreal coniferous forests. In what the altitude is concerned, the interference of the two layers of forest vegetation takes place at about 1300 m, in the Western and central part of the mountain space, while in the Eastern part, the coniferous forests go down to the Dorna Depression, while the nemoral layer is absent.

In Bârgău Mountains, the forests cover an area of 60% of the total surface. The relatively low degree of forestation is a consequence of the process of intense anthropisation of the Bârgău's mountain space, since the earliest times. There is an obvious difference in the distribution of forests between the Eastern part of the mountain area, where the afforested surfaces are more compact, and the grasslands which occupy more restricted territories, corresponding to the Western and central areas, where the forests have a discontinued presence and the share of the grasslands is clearly higher.

2. THE STRUCTURE OF THE FORESTS ACCORDING TO THE SPECIES

The forest vegetation from Bârgău Mountains consists mostly of coniferous species which together form almost ¾ of the total surface (74.2%). Of these, the best represented is

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the spruce (*Picea abies)*, which extends on an area of 30.514 ha (65.6%), followed by the fir (*Abies alba)* which covers a zone of 40139 ha (8.6%). The other speciesof conifers (pine and larch) are included in the VR category (various resinous), but their share is reduced to the content of the mountain unit (0.9 %), covering a surface of only 402.2 ha (fig. 1).

Deciduous species represent almost ¼ from the forest vegetation of Bârgău's mountain space, the highest share belonging to the beech *(Fagus sylvatica)* (22.4%) which covers a zone of 10,390.7 ha. It is followed by the mountain maple (*Acer pseudoplatanus*) which extends on an area of 650.3 ha (1.4%), while the arboretum of various hard and soft essences covers only 515.7 ha (1.1%).

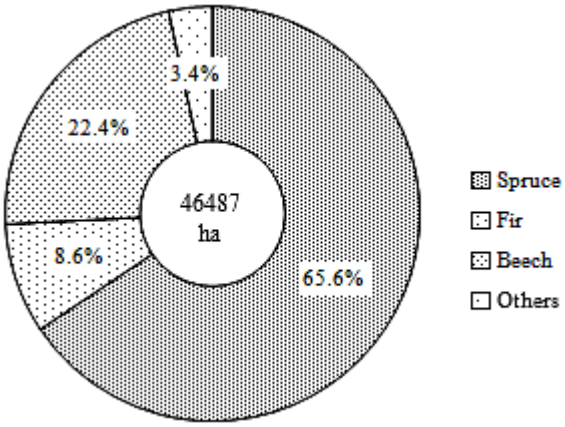

Fig. 1. Bârgău Mountains. The share of the forest species (2010).

In what the distribution of the spruce arboretum is concerned at the level of the forestry commissions and the unities of production, the largest surface belongs to Prundu Bârgăului forestry commission (43.2%), followed by Ilva Mică forestry commission, with a share of 33.6% from the total of the territory covered by spruce in Bârgău Mountains. More confined zones belong to the units of production of Cucureasa, with a surface of 3163.9 ha (9.7%) and Dornişoara with 4401.7 ha (13.5%). The fir is part of the arboretum of all the forestry commissions and the units of production from the compass of Bârgău's mountain space, the highest share belonging to Prundu Bârgăului forestry commission with almost half of the mountain unit's fir arboretums (49.7%).

The share of the forest species in Bârgău Mountains (2010)

Table 1

Species	Surface		Volume			Growth	
	ha	%	m³	%	m³/ha	m³	m³/ha
Spruce	30514	65.6	11270112	75.9	369	301177	9.9
Fir	4013.9	8.6	1427889	9.6	356	32740	8.2
Beech	10,390.7	22.4	1990905	13.4	192	57206	5.5
Maple	650.3	1.4	67731	0.5	104	2327	3.6
VH	283.5	0.6	22557	0.2	80	1410	5
VS	232.2	0.5	21411	0.1	92	660	2.8
VR	402.2	0.9	48433	0.3	120	3044	7.6
Total	**46,486.8**	**100**	**14849038**	**100**	**319**	**398564**	**8.6**

VH = Various Hard; VS = Various Soft; VR= Various Resinous.
Source: The Forestry and Forest Products Research Institute, Bucharest.

Ilva Mică forestry commission has a surface of 1855.3 ha (40.9%), while Dornişoara and Cucureasa units of production encompass restricted areas covered in fir forests of 274.2 ha (6%) and 154.4 ha (3.4%), respectively.

The beech arboretum comes second with respect to its extension in the compass of Bârgău Mountains, covering a total surface of almost 10500 ha. The highest shares are owned by the forestry commissions of Prundu Bârgaăului and Ilva Mica, which form together 94.2% of the territory covered in beech forests of the mountain unit. Domnişoara and Cucureasa units of production encompass confined areas of 116,4 ha and 559.3 ha, respectively (table 1).

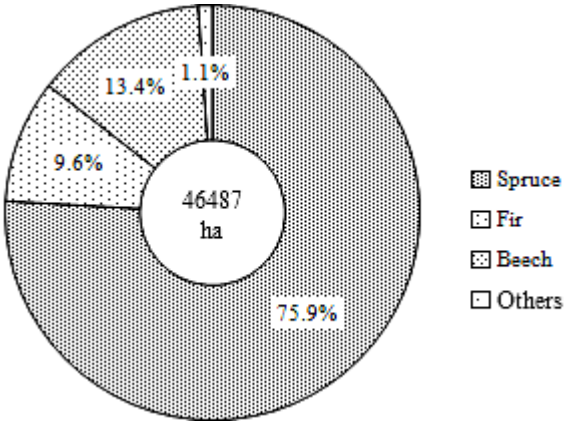

Fig. 2. Bârgău Mountains. The share of the volume of timber the forest species (2010).

In conclusion, the three main species: spruce, beech and fir represent 96.6% of the forest vegetation of Bârgău Mountains. If one takes into account the volume of timber from these essences, the share of the three species is even higher (98.9%) (fig. 2).

This is obvious if one thinks that both softwood and beech grow thick, and that their average age is considerably higher in comparison with that of the other species.

3. THE STRUCTURE OF THE FORESTS ACCORDING TO THE AGE CLASSES

This structure closely mirrors the farming practices from the past and it materializes in imbalances between the age classes. In Bârgău Mountains, the structure of the arboretums according to the age classes is the following: the 1st class - 7099 ha, the 2nd class – 10,123.7 ha, the 3rd class - 9862, 3 ha, the 4th class – 6908.8 ha, the 5th class – 5746.4 ha and the 6th class – 6746.6 ha. One can thus notice an imbalance to the detriment of the 5th age class while the high shares are those of the 2nd and 3rd classes (fig. 3).

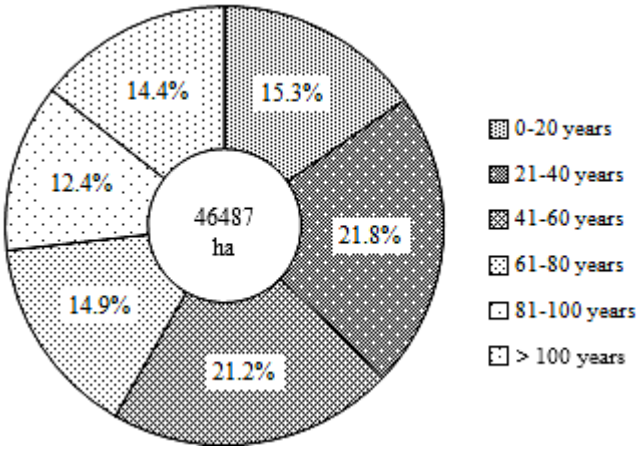

Fig. 3. Bârgău Mountains. The distribution of forests considering the age classes (2010).

Thus, if the 2nd age class (that of the arboretums aged between 21 and 40 years old) and the 3rd one (of the arboretums aged between 41 and 60 years old) cover together 40% of the

forest surface of Bârgău's mountain space, the 5th age class (of the arboretums aged between 81 and 100 years old) is restricted to only 12.4% of the forested territory, that is 5746.4 ha.The other age classes (the 1st, the 4th and the 6th) occupy almost equal surfaces: 7099 ha (the arboretum aged between 0 and 20 years old), 6908.8 ha (the arboretum aged between 61 and 80 years old) and 6746,6 ha (the arboretum that is older than 100 years old).

At the level of species, the spruce (*Picea abies*) has the highest share in the 3rd class (between 41 and 60 years old), while in the 6th class (over 100 years old) the spruce arboretum represents only 51.1% of the total surface of the forests. The fir (*Abies alba*) outranks the other species in the 6th class, covering 828.6 ha which represents the highest share (12.3%). It is worst represented in the 2nd class (arboretum aged between 21 and 40 years old), covering only 6.2 % of the total surface (table 2).

The distribution of forests considering the age classes in Bârgău Mountains (2010)

Table 2

Species	**0-20**		**21-40**		**41-60**		**61-80**		**81-100**		**>100**	
	ha	%	ha	%	ha	%	ha	%	ha	%	ha	%
Spruce	4285	60.4	6459.3	63.8	7371.1	74.7	4883	70.7	4064.6	70.7	3450.6	51.1
Fir	639.1	9	623.9	6.2	770.6	7.8	625,8	9.1	525.9	9.2	828.6	12.3
Beech	1661.5	23.4	2371.8	23.4	1501.8	15.2	1322,4	19.1	1090.7	19	2442.5	36.2
Maple	239.8	3.4	274.6	2.7	81.2	0.8	35,7	0.5	11.6	0.2	7.4	0.1
VH	57.5	0.8	122.9	1.2	63.9	0.6	24,3	0.36	12	0.2	2.9	0.04
VS	63.9	0.9	87.6	0.9	48.8	0.6	15,1	0.2	16.8	0.3	0	0
VR	151.8	2.1	183.6	1.8	24.9	0.3	2,5	0.04	24.8	0.4	14,4	0.26
Total	**7098.6**	**100**	**10123.7**	**100**	**9862.3**	**100**	**6908.8**	**100**	**5746.4**	**100**	**6746.6**	**100**

VH = Various Hard; VS = Various Soft; VR= Various Resinous.
Source: The Forestry and Forest Products Research Institute, Bucharest.

The beech (*Fagus sylvatica*) is best represented in the 6th class (arboretum of over 100 years old) with a share of 36.2% which means a surface of 2442.5 ha. At the opposite end, it has the lowest share in the 3rd class (with arboretum aged between 41 and 60 years old), representing only 15.2% of the forested territory belonging to this age category. The mountain maple (*Acer pseudoplatanus*) occupies bigger surfaces in the first two age classes (over 200 ha in each), while the mountain maple arboretum which exceeds 41 years old covers less than 150 ha (135.9 ha). This demonstrates that in the last half of the century extensive planting operations of this species were undertaken in the compass of Bârgău's mountain space. The same situation can be noticed in the case of the various kinds of softwood. Their share in the age class of over 41 years old does not exceed 0.5%, while, in the case of young arboretums (0-40 years old), the share exceeds 1.5% (2.1% - for those within the age range of 0-20 years old and 1.8% - for the age range between 21-40 years old).

The presence of the aging forests within Bârgău's mountain space is explained by their inclusion in different protected areas such as Transylvania and Bistrita Gorges, Repedea Valley etc. On the other hand, the high shares of the 2nd and 3rd classes are a consequence of the massive deforestation of the areas in question over the last decades and their subsequent massive reforestation with softwood and fast growing species.

Besides its economic importance, a balanced structure of the age classes is absolutely necessary for the health of the forests which, if eqaully distributed, are capable to regenerate more rapidly after hazards like strong winds.

4. THE STRUCTURE OF THE FORESTS ACCORDING TO THE CLASSES OF PRODUCTION

Productivity is a fundamental economic feature of the forests that reflects the natural conditions and the effects of the management of the forest. It determins its capacity of production and depends on pedoclimatic conditions. The establishment of the classes of production is the task of the forestry researchers who work with management plans which take into consideration the species and their age. Thus, the forest vegetation is included in three groups of productivity: superior, medium and inferior. The specialists' main concern is the increase of productivity in more or less favourable ecological conditions.

In Bârgău Mountains, the woods of superior productivity (1st and 2nd class) occupy a surface of 25,379.7 ha (54.6% of the total). They are followed by those of medium productivity (3rd and 4th class) that cover 20,937.9 ha (45.1%) and those of inferior productivity which occupy 169.2 ha (0.3%).

In spite of owning variable shares, the forests of superior productivity make up the majority of the forest areas of forestry commissions. The superior productivity arboretum occupies more restricted surfaces both in lower regions, where beech forests prevail (Josenii Bârgăului, Prundu Bârgăului, Leşu) and in higher regions with spruce forests (situated in the Eastern part of the mountain unit). This situation is explained by the unfavourable environmental conditions characterizing the high altitudes as well as through the inconsistency between the resorts and forest formations which occurred following the reforestation. In Bârgâu's mountain space, the spruce arboretum belonging to the superior classes of production holds the largest surface, of 20,633 ha, representing 44.4% of the forest vegetation of the mountain unit, while the fir and beech arboretums cover together only 4279.8 ha (9.2%).

In Bârgău Mountains, the medium productivity belongs especially to the spruce and beech arboretums. The spruce covers a surface of 9869.7 ha (21.2%), whereas the beech extends over an area of 9029.6 ha (19.4%). The inferior productivity is characteristic to the areas with limiting factors for the arboretum, or where the plantations were performed in an inappropriate manner, as well as in areas where graftings and illegal forest fellings occurred. At the level of the species the largest surfaces belong to the beech arboretums (42.9 ha), followed by various hard essence arboretum (36.7 ha) and various softwood arboretum (36.6 ha). The most confined surfaces included in the inferior class of productivity correspond to the softwood arboretums: fir (14.7 ha), spruce (11.3 ha) and the mountain sycamore arboretum. This last species covers only 2 ha of the total forested surface of Bârgău's mountain space.

5. THE STRUCTURE OF THE FORESTS ACCORDING TO THE TYPE OF MANAGEMENT

The main mission of forestry is the creation of forest formations capable of producing timber and other products indispensable for the fulfillment of the economic needs. Forestry is equally responsible for the protection and the improvement of our natural environment. The management of the forests depends on the goal that is pursued. Its aim is to ensure the continuity of the production and the protection of the forest in order to increase productivity, the role of the forest protection as well as its economic value (Chiriță, C., 1981).

The subunits of production have suffered significant modifications with regard to their extension over the last decades, as a result of the adoption of the new technical norms concerning the arrangement of the forests. Nowadays, in Bârgău Mountains, one can find the following units of production (fig. 4): P.S.U. „A" - regular *codru* with usual assortments (66.8%); P.S.U. „C" - forests destined to retrocession (12.1%); P.S.U. „E" - fully protected forests (1.5%); P.S.U. „G" - gardened *codru* (1%); P.S.U. „K" - seed reservations (1.6%); P.S.U. „M" - especially preserved forests (17%).

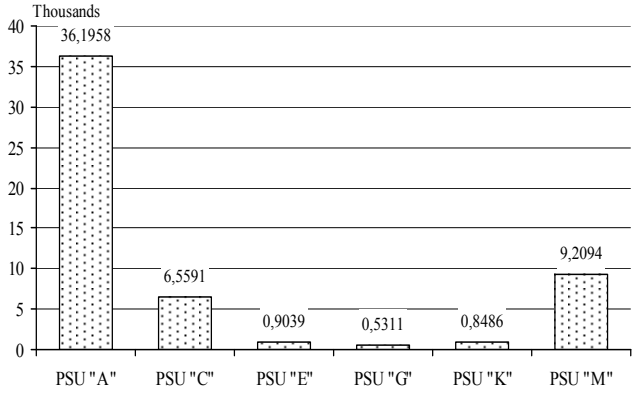

Fig. 4. Bârgău Mountains. The structure of the forests considering the manner of administration (2010).

The most extended production subunit of Bârgău's mountain space is regular *codru* with usual assortments which covers 36,195.8 ha, representing 66.8% of the total surface of the forest. From the economic point of view, it represents the most important subunit of production because it offers significant quantities of timber of various assortments. Presently, in Bârgău Mountains, there are forested surfaces that have not been returned to their former owners. They represent subunit „C" which comprises 6559.1 ha, representing 12.1% of the total forests of the analyzed region.

The fully protected forests (S.U.P. „E") represent only 1.5% of the total surface of Bârgău's forests. They cover areas belonging to the communes of Bistrița Bârgăului, Lunca Ilvei and Tiha Bârgăului. In these areas, the management is limited to treatments and thinning which do not affect the structure of the arboretum. It is also aimed at eliminating potential threats that could cause the degradation of the natural vegetation.

The gardened codru sums up a surface of 531.1 ha, (1.0% of the total of the forests in Bârgău Mountains) illustrating the lesser importance of this subunit of production. Much more extended in the past, the territory occupied by the gardened *codru* has diminished considerably in the last decades. This type of management, quite rudimentary, consists of repeated extractions of trees, so that in two or three decades the vegetation will be thin enough to regenerate naturally through seeds and sprouts.

Although *the seed reservations* (S.U.P. „K") do not feature significant shares (1.6%), they are present in all the forestry commissions. They cover larger surfaces in Ilva Mică (447.2 ha)

and in Prundu Bârgăului (257.1 ha). Their wide distribution is determined by the necessity of supplying the forest administrations with good quality seeds which are obtained through the inclusion of geneticall healthy arboretum in this category.

The especially preserved forests correspond to the production subunits in group "M". They occupy a surface of 9209.4 ha, representing 17% of the total forested area of the mountain unit. They are present in the vicinity of the natural reservations and in the zones where the protective role of the forest is significant. In these areas only treatments and preservation works are performed and the regeneration occurs naturally, in general.

In conclusion, depending on the type of management, in Bârgău's mountain space there are six types of production subunits. Three of them occupy the largest surfaces (regular *codru* with usual assortment, especially preserved forests and the forests destined to retrocession) summing up 95.9% of the overall forested area of Bârgău Mountains. The rest of the categories sum up only 2183.6 ha, which represents 4.1% of the surface of the mountain unit's forests.

6. THE STRUCTURE OF THE FORESTS ACCORDING TO THE FUNCTIONAL GROUPS

The identification and definition of the functional groups of the forest vegetation were determined by the amplification of the society's needs with regard to this essential component of the natural environment. It was also necessary to differentiate between types of management of the forests on the basis of the nature and intensity of the request. The zoning and the planning according to the functional aspect of the forests in Romania were realized for the first time in the 6th decade of the 20th century. Subsequently, they were revised and improved. The circumscription of the forests in one functional group or another, the improvement and revision works and the functional mapping of the entire arboretum are simultaneously performed.

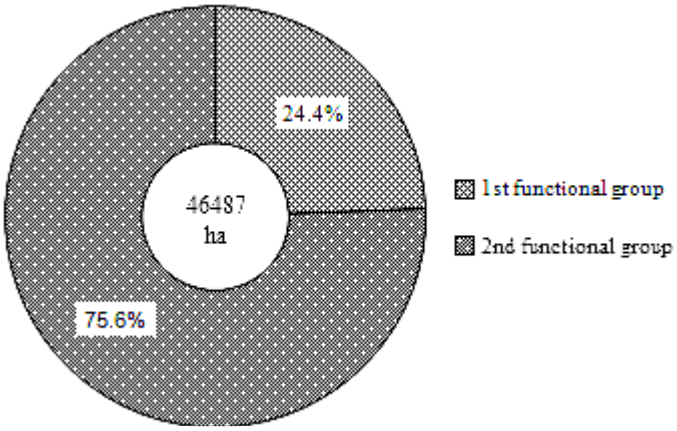

Fig. 5. Bârgău Mountains. The structure of the forests considering the functional groups (2010).

Nowadays, in Bârgău Mountains, the distribution of the forest vegetation considering the two functional groups is the following: the 1st group - forests with exclusively protective role (24.4%); the 2nd group - forests meant for production and protection (75.6%) (fig. 5). The surface covered by the forests in the 1st functional group has increased significantly after the HCM 114/1954 was passed while the surface of the forests in the 2nd functional group was reduced. The cause of the diminishing of the forest vegetation zone in the 2nd functional group is the result of the change of policies regarding the protection of the environment and the increased importance of the forests protection for their economic significance. In Bârgău Mountains, the forests from the 1st functional group (having an exclusively protective role)

cover a surface of 11,363.3 ha. Their role is to protect the environment. With reference to the species, the spruce prevails, occupying an area of 66.8% of the total forested surface in the 1st group (table 3). It is followed by the beech (17.2%) and the fir (10.6%). The other species are confined to smaller zones, of only 606.2 ha (5.4% of the total). In the absence of any information about the subgroups of this category (the protection of the forest waters; the protection of the forests soil and substratum; the protection of the forests against damaging climatic and industrial factors; the protection of the forests for their social interest, their tourism and leisure functions and thier scientific functions; and the protection of the forest species) our analysis is not complete. Instead, we were obliged to limit ourselves to the general presentation of this functional subgroup.

The forests from the 2nd functional group (with production and protection role) represent only 75.6% of the forest's vegetation of Bârgău's mountain space (35,123.5 ha). From the point of view of the species, the highest share belongs to the spruce (65.3%), followed by the beech (24%) and the fir (7.9%). The other forest species cover a more confined surface, of only 961.6 ha, representing 2.8% of the forested zones in the 2nd functional group. The production function has been attributed to those forests which provide different types of natural products. These forest surfaces can display protection features as well. However, these are given secondary importance in comparison with the production function.

The structure of the forests considering the functional groups in Bârgău Mountains (2010)

Table 3

Species	1st functional group		2nd functional group	
	ha	%	ha	%
Spruce	7595.9	66.8	22,918.1	65.3
Fir	1210	10.6	2803.9	7.9
Beech	1951.2	17.2	8439.5	24
Maple	189.9	1.7	460.4	1.3
VH	111.4	1	172.1	0.5
VS	103.9	0.9	128.3	0.4
VR	201	1.8	201.2	0.6
Total	**11,363.3**	**100**	**35,123.5**	**100**

VH = Various Hard; VS = Various Soft; VR=Various Resinous.

Source: The Forestry and Forest Products Research Institute, Bucharest.

In the future, an increase of the share of the forests from the 1st functional group (forests with an exclusively protective role) up to 50% is aimed at. The specialists' calculations take into account the principles of the long-term management of the forests, the preservation of the landscape and of all the natural components of the environment, as well as the development of the tourist activities based on a varied and attractive tourist potential.

6. CONCLUSIONS AND SWOT ANALYSIS

A generous space thanks to its environmental offers, Bârgău Mountains represent, from the perspective of the forest potential, a complex zone, if we consider the variety of the component elements which can be exploited for different purposes. Thus, besides the timber, which remains undoubtedly the main component given its tremendous economic importance, forests of Bârgău Mountains host other assests, too. By exploiting these assets in agreement with the principles of the long-term development, an increase of the material and social welfare of the anthropic component of this territory can be reached.

Unfortunately, nowadays, there is no clear strategy of exploitation of the forests. More often than not, timber is extracted with disregard to the forest's capacity of regeneration. There are not any efficient policies of reforestation and no adequate management of the waste resulted from the primary processing of the wood. An important sector of Bârgău Mountains, corresponding to Leşu River, is known as "The Sawdust Valley". Nineteen sawmills function in the perimeter of Leşu commune. Eight of them have no authorization and damage significantly both the environment and the state budget. According to the specialists, the cutting of the trees from the category of softwood in this area represents a real danger for the environment. The processed timber of softwood origin (spruce and fir) produces sawdust that becomes acidic through decomposition. In time, the acid will affect the edaphic coating, through the change of the pH level and the river waters as well, as many of the sawdust storehouses are placed very close to Leşu River. Similar situations are registered on the upper course of Ilva River, on the territory of Lunca Ilvei commune.

The other components of the forest (herbs and berries, mainly), with high economic potential, if properly exploited, can help improve the material welfare of the local population, especially nowadays, when the organic and bio products are massively promoted. Various projects which are designed to exploit the local resources existing at the level of the forest components can help engage European funds with the purpose of developing small industrial units for the processing of berries and the packing of herbs. Unfortunately, this exceptional natural potential is almost completely overlooked. The inhabitants from Bârgău's mountain space have to exploit these resources of the forest individually and at low prices in the absence of an efficient system of collecting and processing them. Regia Națională a Pădurilor (Romsilva) or private entrepreneurs should develop an efficient system of collecting and processing the resources that do not belong to the wood category of the forest. In this way, important incomes could be obtained, which might be useful for the development of the economy of the local communities and of every family unit, in particular.

The SWOT analysis of the forests of Bârgău Mountains highlights the positive and negative aspects of the studied region, equally emphasising the multiple possibilities of development of the forest economy, and the different obstacles that could appear in the way of the evolution of this component of the local economy (the forest).

Strong points: the specific variety of the forests; the large surface occupied by the forest; the existence of forest roads; the diverse offers of the forests; the superior productivity of the forests etc.

Weak points: the lack of forestry planning rigorously and professionally performed; the decommissioning of the railway road Bistrița Bârgăului-Colibița used for the transport of timber; the lack of specialised units for the superior processing of wood; the closing of the sawmill from Bistrița Bârgăului; the high disruption of the forest properties; the disuse of the wood waste resulted from exploitation to generate electricity and thermal energy; the failure to accomplish the actions of retrocession of the forests.

Opportunities: investments in the field of wood processing; the creation of new jobs; the creation of centres for the collection of berries, herbs and mushrooms; the possibility to engage European funds for investments in the field of the forest products (berries, mushrooms, herbs) processing.

Threats: the felling of trees and landslides; the breaking of the law; erosion processes on the cleared mountainsides; the pollution of the waters with waste resulted from the primary processing of the wood.

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RESOURCES APPROACH AND LAND-USE CHANGES IN GRAN CANARIA. CASE STUDY: MASPALOMAS DUNES

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ABSTRACT. – Resources Approach and Land-use Changes in Gran Canaria. Case Study: Maspalomas Dunes. The last centuries have been marked by a significant increase of human-induced disturbances in the natural environment, as man uses an increasing proportion of the earth's surface, in order to capitalize, one way or the other, the natural resources. The aim of this research was to analyze the land-use and resources approach changes in Gran Canaria, as well as their consequences on the natural environment, focusing on the Maspalomas dunes system. The set of methods used in this research was made of quantitative and qualitative analyses, along with partially structured interviews and direct observation. During the agricultural society, sand has been seen as a potential threat to crops due to its unpredictable mobility. Moving towards the tourism based economy, the importance of sand as a resource increased, resulting in ample land-use changes with consequences both on the natural ecosystem and the human activities. Nowadays, there is an intense preoccupation for preserving the Maspalomas dunes system, not only for environmental reasons, but also for maintaining the main tourist attraction of the island.

Keywords: *resources, land-use changes, preservation, sustainable development.*

1. INTRODUCTION

The last centuries have been marked by a significant increase of human-induced disturbances in the natural environment, as man uses an increasing proportion of the earth's surface, in order to value, one way or the other, the natural resources. The predominance of different types of disturbances, as well as the extent of the modifications, are indubitably related to the land-use features (Mooney, H. A., Hobbs, R. J., 2000).

As the economy and technology have considerably changed across time, so have the development perspectives and therefore the land-uses and resources approach. During the last decades, the concept of sustainable development has challenged governments and administrations to search for means in order to accomplish self-sufficiency and to find a balance between exploitation and conservation of resources.

2. AREA OF INTEREST – LOCATION AND HISTORICAL CONTEXT

Gran Canaria is the third largest island of the Canary Islands, a Spanish Archipelago located in the Atlantic Ocean, on the 28º N parallel, approximately 100 km off the north-western coast of mainland Africa. Canary Archipelago is formed of seven islands: Tenerife, Fuerteventura, Gran Canaria, Lanzarote, La Palma, La Gomera, El Hierro, along with several islets, and represents an autonomous community of Spain.

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Despite being the third largest island of the group, Gran Canaria has a numerous population, 845,676 inhabitants in 2010, representing 40% of the entire archipelago. Location, along with geomorphologic and climatic features, shaped a high diversity environment, especially in Tenerife and Gran Canaria.

Since completing the conquest of the islands in the 15th century until well into the 20th century, the local economy was strictly based on agriculture and trade, as the subtropical climate and fertile soils provided favourable conditions for cultivations. After 1950 and especially during the next three decades, tourism increased progressively, claiming new land-use demands and reshaping the territory. Nowadays, Gran Canaria is a mosaic of landscapes, reflecting the land-use changes undergone in the last five centuries.

3. RESEARCH METHODS

The methods used for the present research were quantitative and qualitative analyses of land-use, based on the regional statistic data and available on the Government of Canary Islands official internet page, in order to establish the land-use types and disturbances associated.

In order to have a comprehensive view over the Maspalomas Dunes system, its processes and relations, it was necessary to talk to the geographers who have been studying the phenomenon in the last decade. This was facilitated by the use of partially structured interviews, applied during a two-week Intensive Program in Canary Islands, in April – May 2011. Thus the interviews were applied to PhD researchers from the Las Palmas de Gran Canaria University and the University of Seville. The ensemble of methods was completed by the direct observation of the dunes, emphasizing the main characteristics of the system, the land-use changes in the area as well as their consequences.

4. NATURAL VEGETATION IN CANARY ISLANDS

As mentioned above, a high diversity environment has been formed, resulting from the interaction of geographical factors such as: land shape, soils and climate. The vegetation distribution is a consequence of altitude, orientation, wind exposure, temperature and precipitation.

Vegetation can be described according to the following elevation zones:

- at the lowest elevation the **coastal vegetation** grows. Endemic palm trees (*Phoenix canariensis*) and semiarid vegetation can be found. This vegetation type occurs up to 500 m in the northern slopes of the islands and to much bigger extent in the southern slopes (ca. 1,000 m). Species found here include *Euphorbia canariensis, Euphorbia balsamifera* and *Euphorbia aphylla*. Coastal vegetation consists of halophyte association as well, which form a narrow belt just above sea level, where plants need to be adapted to high degree of salinity in the soil. Stems and leaves of the plants are morphologically modified (succulent and fleshy), where saline water is stored to establish a balance with external conditions and avoid dehydration;

- along the transition zone from 50 to 500 m, between the sea level coastal vegetation and laurel forest, **thermophilous vegetation** can be found. The species found here are common to lower and higher vegetation zones as well. These areas were agriculturally developed in the past, so the natural vegetation is mostly damaged. Among others *Phoenix canariensis, Dracaena draco, Pistacia lenstiscus, Olea europaea, Rumex lunaria* can be found;

- climate parameters on the island provide favourable conditions for subtropical **laurel forest** to grow (high degree of humidity, precipitations). These conditions are fulfilled in the northern and north-eastern slopes of the islands on the altitude of 500 – 1,500 m in areas where

the Trade winds blow and form a sea of clouds. On the southern slopes of the islands the different conditions (low humidity) make it impossible to grow. From the ecological point of view it has a special importance, since it provides vast biodiversity (and high degree of endemic species. Representative species of laurel forest are *Laurus azorica, Apollonias barbujana, Persea indica, Arbutus canariensis, Erica arborea, Myrica faya;*

- above the laurel forest the air is drier, the insolation is more intense and daily/seasonal temperature amplitudes are higher with a possibility of frosts and even snow. In these climatic conditions the **pine forest** evolved, ranging from 1,200 to 2,400 m, depending on the local conditions. Two types of pine forest can be distinguished, more humid one on the northern slopes and drier one on the southern slopes, reaching lower altitudes. It consists of endemic *Pinus canariensis* with several other endemic species;

- reaching an altitude of 2,000 m and above vegetation increasingly adapts to the special environmental conditions like strong winds, very low humidity level, scarce rainfall, high insolation, cold winters with hot summers and high daily/seasonal amplitudes.

5. LAND-USE CATEGORIES AND HUMAN DISTURBANCES IN GRAN CANARIA

5. 1. Agriculture – exploitation of natural ecosystem and natural vegetation replacement

Since the conquest of the archipelago, the exploitation of the native ecosystem together with the agricultural practice has been the main economical activities developed. From the late 15th century until the first half of the 20th, agriculture and commerce dominated categorically the economy of Gran Canaria.

Considering the main primary sector practices, two types of agriculture can be distinguished.

5. 1. 1. Commercial agriculture

The Canary Islands agriculture has been very unstable, due to competition and commercial market fluctuations. Since the 15th century, there has been a continuous reinvention of cultivations.

The sugar cane period started at the end of the 15th century. The crops covered large coastal areas of Gran Canaria. It was the first product exported from the Canary Islands. The lower price of the sugar coming from Morocco and Central America led to the abandonment of this crop in Canary Islands.

The vineyard period started right after the fall of sugar cane cultivation. Gran Canaria wines were well received by the American and English markets, so that the economy of Gran Canaria was based on wine production until the end of the 17th century, when former markets went down and depression emerged.

Once with the trading liberalization, the *cochineal production* developed on the island. The cochineal is a scale insect growing into the fruits of cacti, and it is used as a colorant substance in food industry, textile industry and cosmetics.

Since the 19th century the agriculture was orientated towards *banana and tomato cultivation*, activities still found, at a much lower scale, on the island. Agricultural activities have been the most important income source of the island until mid 20th century.

At the beginning of the 1950s, tourism activities emerged, therefore land-use has become more orientated towards constructions. Agricultural land-use has decreased considerably since then, instead has become more diverse (fig. 1), by introducing new types of cultivations. One of the last introduced commercial agriculture cultivations is represented by ecological orchards.

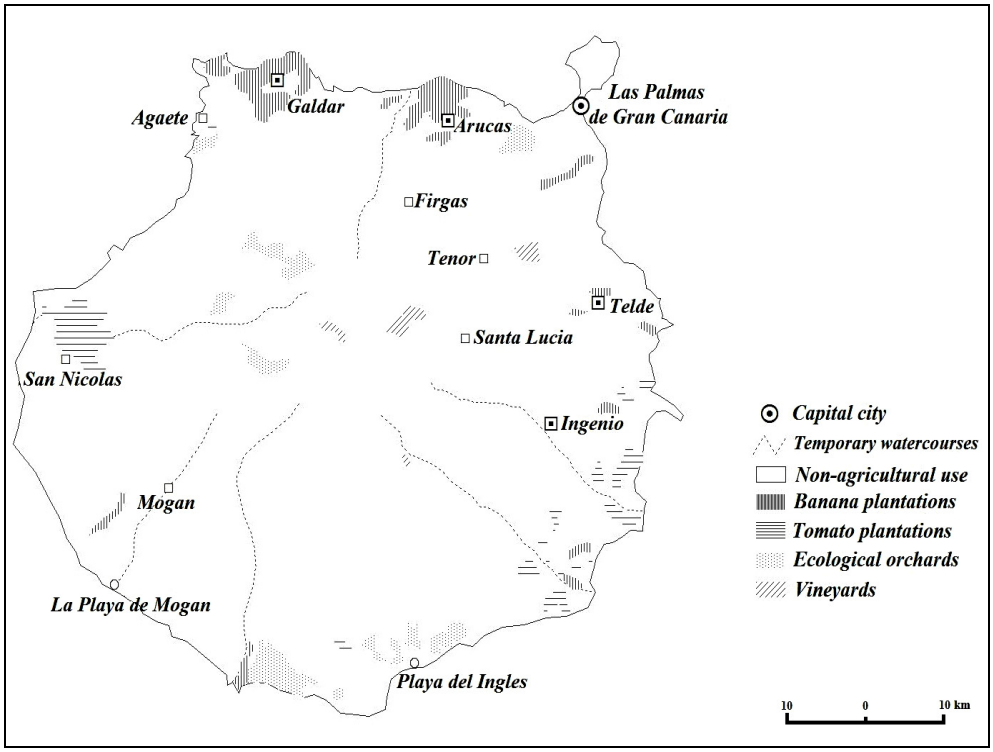

Fig. 1. Types of cultivations in Gran Canaria.

Ecological orchards have gained interest during the last decades, especially in the centre and south of the island. As ecological product demand is more and more increased on the European market, this type of cultivation might re-launch Gran Canaria agriculture.

Nowadays, commercial agriculture occupies smaller areas, but more concentrated ones. Significant agricultural land surfaces have been transformed into golf courses or other leisure facilities, so that traditional rural areas are being urbanized. One of the exceptions is however, the area surrounding San Nicolás, with an extended tomato plantation, the largest most compact tomato cultivation area of the island.

On the other hand, banana cultivation faces a barrier, as the product cannot be placed onto European market due to its smaller size compared to South American products. Therefore, Spain is the main market for the Canary Islands bananas.

5. 1. 2. Subsistence agriculture

Opposite to commercial agriculture, subsistence agriculture has been relatively constant regarding the cultivations. Most of the times, cereals, potatoes, fruits and vegetables are cultivated in small family owned plots. The land is often cultivated with rudimentary techniques although more efficient means like machines are gradually introduced. Due to the high fragmentation of the plots, irregular landforms and low degree of technical input, this type of agriculture is a low outcome.

Fig. 2. Tomato cultivation in San Nicolás de Tolentino.
Source: http://www.justgrancanaria.com/images/places/la_aldea/

5. 2. Urbanization – removal of natural vegetation

Starting with the 1950s, Canary Islands have gained more and more importance as a tourist destination, therefore the entire archipelago suffered an intense process of urbanization.

During the sixth, seventh and eighth decades of the last century, large coastal territories have been covered with accommodation facilities such as hotels and renting apartments (Playa del Inglés, Puerto de Mogán). As tourist demand continued to increase, the process of urbanization has intensified: Playa del Inglés has become the most urbanized area of the island (fig. 3), the majority of the buildings serving as accommodation facilities. The image below illustrates the distribution of urban and rural areas on the territory of Gran Canaria.

There is an obvious concentration of urbanized developments in the coastal areas, the only exception being the western coast. The reason why this part of the island has not been strongly urbanized is represented by the high altitude shore line and the irregular terrain, which did not allow massive constructions.

Rural areas are concentrated in the centre of the island. Part of the rural areas, especially those which are situated closer to the urbanized coast are abandoned farms. As a result of urbanization, coastal vegetation has been reduced, most of it being removed as constructed areas expanded.

However, palm trees and other coastal vegetation species have been artificially introduced in parks, squares and gardens, or along the urban infrastructure arteries.

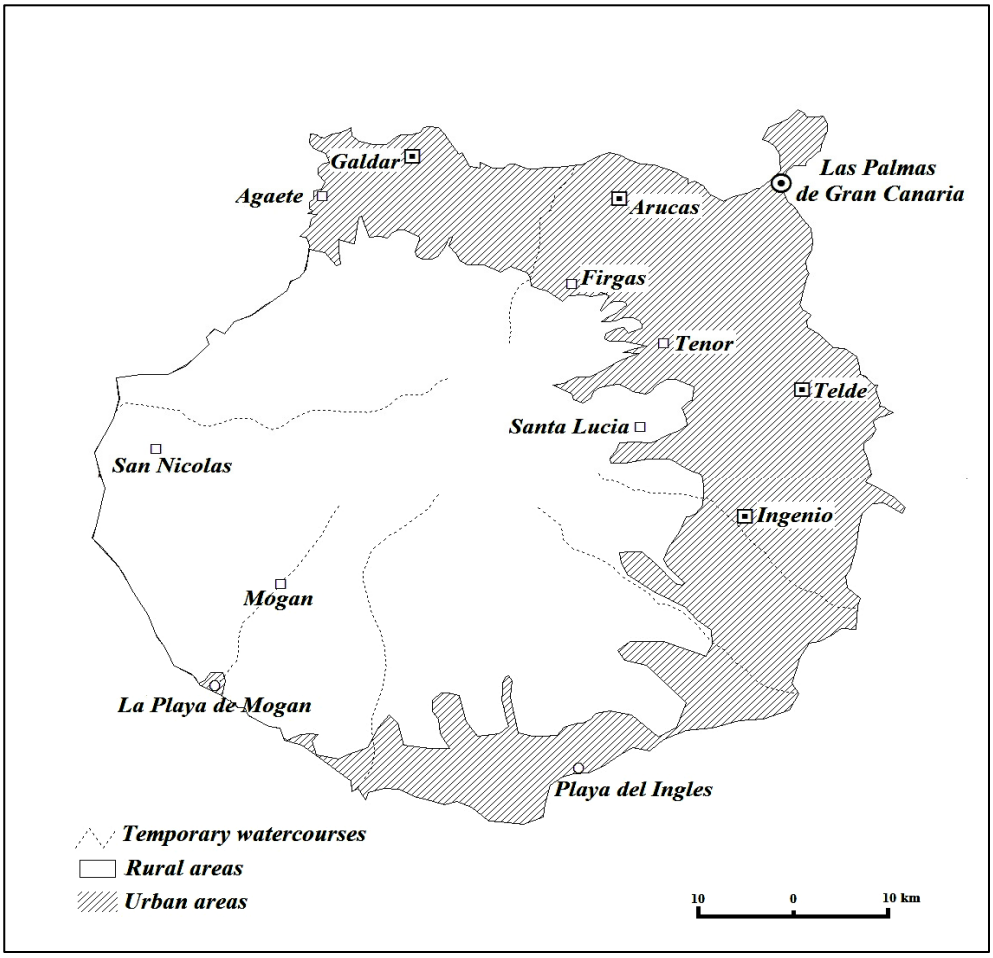

Fig. 3. Urban and rural areas in Gran Canaria.

6. MASPALOMAS DUNES – ECONOMIC IMPORTANCE, LAND-USE AND PERSPECTIVES

Maspalomas Dunes are a mobile sand dunes system located at the far south of Gran Canaria. Although the origin of the dunes has been a controversially debated subject, research developed in the last decades offered answers regarding the main factors that determine a cycle of events.

The physical configuration of the dunes seems to be a result of variable parameters as wind speed, oceanic currents direction, urbanization gradient, etc. Recent studies revealed that the dunes cycle suffers average losses of 42,000 m³ per year. As the dunes are a very important tourist resource (2.5 million tourists per year visiting Maspalomas, out of 3.2 million visiting

the entire island), measures to limit the losses have been taken into consideration. One of these measures refers to supplying the system with large quantities of sand brought from the bottom of the sea. The main disadvantage of this proposal consists in the sand size of the submarine deposits, with very different dynamic characteristics that interfere with the natural movement rhythm of the dunes.

Fig. 4. Maspalomas Dunes, april 2011.

Another possible solution is related to relocation of sand masses within the system, in order to balance the quantity level. This refers to extracting the excessive mass of sand out of the accumulation areas and relocating it at the beginning of the process, so that sand is recycled and therefore losses are avoided.

Considering the complexity of the cycle and its informational gaps, it is extremely difficult to identify optimal solutions and to forecast scenarios about the system dynamics after external interferences. However, the growing tourism market associated with the increase of human pressure demand an integrated management of the area.

7. CONCLUSIONS

The Maspalomas Dunes represent the best example to emphasize the changes regarding resource approach. During the agricultural society, sand was not seen as a resource, but as a threat. As tourism grew, the sand dunes have become one of the most important natural resource of the island. Even though the resource itself did not change, the economic context after the 1950s became different.

Fig. 5. Playa del Inglés urbanization and Maspalomas Dunes.
Source: http://2.bp.blogspot.com/

Historical and economic contexts can radically change the resources approach. Tourism has reshaped development perspectives, precisely because the tourism product has, most of the times, an inexhaustible potential. Research proved that Maspalomas Dunes are an exception, considering that the volume of sand, which is the main tourism product, is constantly decreasing.

At the beginning of the 21st century, when concepts like sustainable development and self-sufficiency constantly challenge the society, finding a balance between exploitation and environmental resilience is very important.

Preservation measures concerning Maspalomas Dunes are nowadays a desideratum both for the protection of the natural ecosystem and the tourism activity. In other words, holistically considered environmental issues can contribute to finding sustainable development paths in the future.

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DRĂGOIASA-TULGHEŞ DEPRESSIONARY ALIGNMENT. THE NUMERICAL EVOLUTION OF POPULATION BETWEEN 1850 AND 2010

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ABSTRACT. – Drăgoiasa-Tulgheş Depressionary Alignment. The Numerical Evolution of Population between 1850 and 2010. The numerical evolution of population in Drăgoiasa-Tulgheş alignment and its spatial distribution among localities is the result of a long evolutionary process. The existing natural framework forms a harmonious territorial unit on the whole, with a well knit structure, in which the steady existence of the inhabitants reverberates. The settlement of this space was auspicious due to the general aspect of orographic barrier, a shelter within the Eastern Carpathians in the past, with few spectacular events. The increase was slow, but constant, and then, in more recent times, this territory has become favorable due to a geographic environment propitious for settlement.

Keywords: *Drăgoiasa-Tulgheş Depressionary Alignment, census, the annual average growth rate, demographic erosion.*

1. INTRODUCTION

For a better individualization of Drăgoiasa-Tulgheş alignment, a detailed analysis of the geodemographic evolution is needed, because it, alongside other types of structures, represents the index of the human potential of the microregion.

On the basis of such a analysis one can also make a prognosis regarding the evolution of the population of this territorial microsystem. In this study, the numerical evolution of the population will be analysed starting from 1850, year from which we have concrete data on the population of Bilbor, Borsec, Corbu and Tulgheş localities.

We also have a series of information even from the year 1785, on Bilbor locality, of a first nominal conscription of men heads of families or just single young men, a list that indicates a number of 16 people, plus another three, that have been mentioned at „Observations". For Tulgheş village, in an archived document, which is actually a complaint of the inhabitants to the authorities in 1795, one can see that there were 24 households. From the pages of the files regarding the "răzeşi" trials with the nobility of Balş (1812-1835), one can see that there were 62 households in Păltiniş, but the exact number of inhabitants is unknown.

2. THE NUMERICAL EVOLUTION OF POPULATION

The community that exists here has evolved almost like a closed system for a long time. The numerical increase of the population took place almost entirely on the slightly positive natural birth rate. With the appearance of the first settlements, we can speak of an intensification of the systematic and organised exploitation of natural resources, with positive effects on the settlements demographic growth, such as Borsec locality, where German and Czech populations were „imported", as qualified work force in mining and glass making, in the second half of the 19th century.

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The proof for the above mentioned statements are the family names that still exist today, like: *Eigel*, *Fokt*, *Kolbert*, *Paller*, *Patka*, *Schiller*, *Straff*, *Thalmayer*, *Vild*, *Kramer*, etc.

Taking into consideration a series of social, economic and political events, the numerical evolution of the population in the Drăgoiasa-Tulgheş area has not been steady.

Thus, depending on the characteristic demographic processes, we distinguish within the 1850-2002 period, 12 demographic evolution phases: 1850-1857, 1857-1869, 1869-1880, 1880-1900, 1900-1910, 1910-1930, 1930-1941, 1941-1956, 1956-1966, 1966-1977, 1977-1992, 1992-2002. After this final step, at the moment, based on statistics, we can make a partial analysis for the 2002-2010 interval, only at territorial-administrative unit level, and then make an analysis for the entire teritory, on the basis of the data of the 2011 census.

2. 1. The positive demographic evolution between 1850-1977

The first *phase 1850-1857* has a relatively uniform positive evolution, with considerable increases in all the localities within the analysed space. After the 1848 Revolution, which engulfed most of Europe, the economic and political life returns to normal, and economic progresses are also being being felt in the Drăgoiasa-Tulgheş alignment, especially in the primary exploitation of timber and mineral waters.

The numerical increase of population happened mainly due to the high population growth and due to the colonisation of a significant number of glass makers and miners from Germany and the Czech lands in Borsec.

During this time, the number of inhabitants increased significantly from 2 890 inhabitants in 1850 to 3 645, which maens that in a short period of just seven years the population went up by 755 persons, which maens an increase of 26,1% and an average annual increase of 59.3 (107 inhabitants/year). In terms of administrative units, the growth rate for the entire period is spectacular in all cases, the most significant population increases being registered in Borsec 52.8%, then Tulgheş cu 27.3% and Corbu cu 25%, while Bilbor only had 11,3%.

The growth rate for the entire period is the result of comparing the population growth ot the number of inhabitants at the start of the period in percentages, according to the relation:

$$R_c = \frac{\Delta P}{P1} \cdot 100 = \frac{P2 - P1}{P1} \cdot 100 = \left(\frac{P2}{P1} - 1 \right) \cdot 100,$$

in which: R_c= the growth rate for the entire period; P_1= number of inhabitants at the start of the period; P_2 = number of inhabitants at the end of the period; Δ_P = the absolute growth for the entire period.

By calculating this index, one can observe by how much has the community increased, from a numerical point of view, correlated to 100 inhabitants.

As for the *annual average growth rate*, it presents the population dynamics form the analysed space for several periods, calculated as a geometric average of the annual growth rate. This index emerges from extracting the n order root from the growth rate for the entire period, expressed in percentages, according to the following formula:

$$R_{mac} = \left(\sqrt[n]{Rc - 1} \right) \cdot 100,$$

in which: R_{mac} = the population annual average growth rate; R_c= the growth rate for the entire period; n = number of yeras that make up the period.

In the *1857-1869 phase* the population from the analysed area Drăgoiasa-Tulgheş continued to grow due to high birth rates. During this 12 year interval, the number of inhabitants increased from 3 645 in 1857 to 4 862 inhabitants in 1869, which means that the territorial ensemble received a demographic surplus of 1 217 inhabitants, with a growth rate of 33,3%, and with annual average growth rate of 33.9% (101 inhabitants/year).

Again at locality level, Borsec is in the lead with a growth of 71.1%, followed by Tulgheş, that keeps its increasing trend of 37.3%, then Bilbor, which stands out from the previous period with a significant growth of 26.1%, and Corbu with 11%, in regress.

The 1869-1880 phase is a year shorter than the previous one (11 years), and it is characterised by a population increase from 4 862 inhabitants in 1869 to 5 987 inhabitants, therefore gaining 1 125 inhabitants, which is a surplus of 23,1% and an annual average rate of 33% (102 inhabitants/year). Borsec continues its ascending trend with an increase of 33.3%, followed by a progress of Corbu locality with 17.5%, then Tulgheş with only 15.3% and a decrease of Bilbor with 13%.

During *the 1880-1900 phase* there was a positive demographic evolution from 5 987 inhabitants in 1880 to 7 338 inhabitants in 1900, with a surplus of 1 351 persons (22.5%) with an annual average growth rate of 36.5%, which proves that during this 10 year interval the highest value of the annual average growth of 135 inhabitants/year was registered.

At the level of depressions, the population of Borsec went up by 553 inhabitants, which means a surplus of 49.5% and an annual average rate of 47.7% (55 inhabitants/year), followed by Tulgheş, with 552 inhabitants (22%), an annual average rate of 36.2% (55 inhabitants/ year), Bilbor with 287 inhabitants, meaning 28.8% and an annual average rate of 40% (27 inhabitants/year), and Corbu with 187 inhabitants (16.3%), an annual average rate of 32.2% (18 inhabitants/year) and an annual average growth of 22,8 inhabitants in Păltiniş.

Even though we do not have data regarding the population of Glodu village, according to the elders, one can observe an old cemetery, where prior to 1900 people were burried following a cholera outbreak.

The 1900-1910 phase is also defined by a population growth from 7 338 inhabitants in 1900 to 8 487 in 1910, also in a 10 year interval, this space receiving a demographic surplus of only 1 149 persons, which shows a decrease in comparison to the previous period, the growth rate for the entire period being 15.6%, with an annual average rate of 31.6% (114 inhabitants/year). In the case of Tulgheş locality we have an annual average growth of 82 inhabitants, a growth rate for the entire period of 27% and an annual average growth rate of 39%; Borsec, with an annual average growth of 19 inhabitants, a growth rate of 11.5% and an annual average growth rate of 27.7%; for Corbu a very low annual average growth rate of 6 inhabitants, with an growth rate for the entire period of 4.7% and an annual average growth rate of 16.7%; Bilbor (6 inhabitants) and a low growth rate of only 5.3%, as well as an annual average growth rate of 18.1%.

During *1910-1930* the population from the Drăgoiasa-Tulgheş Alignment registered a slight decrease, only in the first part of the interval due to human losses in the First World War. The effects of this event encompasses the drastic decrease of the birth rate due to many fertile age men leaving for war. During 1910-1920 the greatest took place in Borsec, 382 inhabitants and in Bilbor with 151 inhabitants.

In the second part of the period, 1920-1930, the population begins to grow again, in Borsec with 686 persons, due to the development of the resort by captalizing the existent mineral waters and the lignite deposits, and the same ascending trend could be observed for the population of Bilbor with 670 persons. For the Glodu and Păltiniş localities from Suceava County there was a special situation, due to the fact that we only we have clear data from the 1912 census.

Therefore, Glodu village had 285 inhabitants together with the encompassing hamlets of Catrinari and Drăgoiasa, while Păltiniş had 268 inhabitants.

If we refer to the entire period, in these 20 years, we onserve a population growth from 8 487 inhabitants in 1910 to 9 827 inhabitants in 1930, meaning a demographic surplus of 1 340 inhabitants (15.7%), resulting an annual average growth of 67 inhabitants and an annual average rate of 14.7%. This time Tulgheş registered the lowest growth rate creşterii for the entire period of only 0.1%, an annual growth rate of 0.2 inhabitants and an annual average rate of -10.8%.

These low values are probably due to the great human losses registered during the war, due to disease and due to a great number of inhabitants leaving, especially the former local authorities, after 1918, once Transilvania reunited with Romania, Tulgheş being a border area; the growth rate for the entire period at Corbu reached 12.5%, an annual growth rate of 8 inhabitants and an annual average rate of 13.4%; for Borsec the growth rate for the entire period was 16.3%, an annual average growth of 15 inhabitants and an annual average rate of 15%, while for Bilbor there was the highest growth rate for the entire period 23.6%, an annual average growth of 15 inhabitants and an annual average growth rate of 17.1%.

At the 1912 census, the village of Glodu was part of Moldova, more exactly part of Suceava County, also encompassing the population of Drăgoiasa and Catrinari hamlets.

There was an annual average growth of 12 inhabitants for Păltiniş commune and 13 inhabitants for the village of Glodu.

The 1930-1941 period, even though it is a 11 year interval, is chracterised by a significant growth in population from 9 827 inhabitants in 1930 to 11 252 inhabitants in 1941, which means that the territorial ensemble receives a demographic surplus un of 1 425 inhabitants (14.5%), with annual average rate of 27.5% (129 inhabitants/year).

At locality level, the growth rate for the entire period has the highest values in Glodu (53%), followed by Bilbor (28%), Tulgheş (16.5%), Corbu (5.5%), Păltiniş (4.5%) and Borsec (3.7%). The annual average growth is 58 inhabitants in Tulgheş, 42 inhabitants in Bilbor, 12 inhabitants in Glodu, 7 inhabitants in Corbu, 7 inhabitants in Borsec and 1 inhabitant in Păltiniş. The annual average rate is 43.4% (Glodu), 35.4% (Bilbor), 29% (Tulgheş) 16.8% (Corbu), 14.6% (Păltiniş), 12.7% (Borsec). One can state that the unprecedented population explosion during this phase took place based on a very high growth rate, and a positive migrating rate. These demographic factors have been stimulated by a steady economic development during the interwar period.

The 1941-1956 phase was influenced by the Second World War plus a series of restrictive factors in the following period (drought, famine, the communist regime, the beginning of the colectivisation). This interval is characterised from a demographic point of view by alternating periods of growths or slight population declines, for the entire period the population of the alignment growing by 724 persons, with an insignificant annual average growth rate of 13.2%. The more significant population growths or declines at administrative level were due to administrative-territorial reorganisations.

Until January 1st 1956, Drăgoiasa and Catrinari were hamlets of the village of Glodu, Păltiniş commune, and after this date, being declared as villages, they were separately reviewed. Therefore, Păltiniş commune had the following villages: Catrinari, Drăgoiasa, Glodu and Păltiniş. Păltiniş commnune also included the village of Dârmoxa (152 inhabitants), which is not part of this study.

So, in 1956, due to heavy investments in the modernisation of the tourism infrastructure as well as due to diversification of the functional profile, Borsec is declared a town. Due to the fact that Toplița became a town in the same year, a series of neighbouring rural settlements are included, like Călimănel, Luncani, Măgheruş, Moglăneşti, Vale, Vâgani, Zencani and Secu, the last one having been a part of Bilbor until 1956.

Starting on 1st January 1956, the hamlet of Răchitiş (Rocoteaş) is declared a village, with a population of 457 inhabitants, and Bilbor with 1 796 inhabitants. At Corbu we also have two villages: Capu Corbului (270 inhabitants) and Corbu (1 638 inhabitants).

In Tulgheş, no less than 10 villages were reviewed at the 1956 census: Hagota (340 inhabitants), Naghirez (312 inhabitants), Pintic (117 inhabitants), Pârâul Asodului (31 inhabitants), Poiana Nouă (316 inhabitants), Poiana Veche (211 inhabitants), Putna Mare (381 inhabitants), Recea (241 inhabitants), Sângeroasa (961 inhabitants) and Tulgheş (1 809 inhabitants).

The 1956-1966 phase is characterised by a slight demographic growth due to natural growth and a positive migrating rate. Starting with this period, we can better observe the demographic evolution of the villages of Păltiniş, Drăgoiasa, Catrinari and Glodu.

At the level of the analysed space, the popualtion grew during this 10 year period by 840 persons, so by 116 persons more than during 1941-1956, resulting in a growth rate for the entire period of 7%, an annual average rate of 84 inhabitants and an annual average growth rate of 21.4%. At the depression level, the population of the village of Catrinari registered an annual average growth of 2 inhabitants (32.1%), Glodu with an annual average growth of 7 inhabitants (20.1%), Bilbor with an annual average growth of 48 inhabitants (21.3%), Borsec with an annual average growth of 43 locuitori (18.6%), Corbu with 21.7 locuitori (11.3%) and Tulgheş an annual average decline of -6 locuitori (-1.2%).

The annual average growth rate was 41.4% (Catrinari), 35% (Glodu), 35.8% (Bilbor), 34% (Borsec), 27.5% (Corbu) and -2.4% (Tulgheş).

During the *1966-1977 phase*, after the establishment of communism, a series of political and economic laws were promulgated, which proved highly damaging for the entire geographic space of the alignment, with effects that can be felt even today in multiple domains.

This period started with the infamous Abortion Law, which caused the birth rate to skyrocket. At the same time, there was an unprecedented development of industry, the following period being known as „*the phase of forced industrialisation*", the neighbouring towns of Vatra Dornei, Toplița, Borsec and Gheorgheni attracting a significant part of the population from rural areas, and some communes went on to become towns, the best example being Tulgheş.

In this 11 year period, we observe the last demographic growth, this time insignificant (49 inhabitants, meaning 0.3%, with an annual average growth of 5 inhabitants and an annual average rate of -10.3%). Regarding the 9 settlements, the situation was as follows: an annual average growth of 2 inhabitants (Catrinari), 1 inhabitant (Glodu), 17 inhabitants (Bilbor), 22 inhabitants (Borsec). In Corbu an annual average population decline of -33 inhabitants was registered after 1970 due to the industrial development of neighbouring towns (Toplița, Borsec, Gheorgheni), as well as due to the operation of the Tulgheş uranium mine.

During 1956-1977, at the level of the villages of Glodu, Catrinari, Drăgoiasa and Păltiniş, there was a demographic growth, followed by a decline due to an decrease in the natural surplus and an increase in permanent territorial exomobility.

Therefore, mostly young people left and settled in other localities, since the employment opportunities were very low or nonexistent in the places they left behind.

The numerical evolution of the population within Drăgoiasa-Tulgheş alignment between 1850 and 1956

Table 1

Crt. no.	Locality	Year								
		1850	**1857**	**1869**	**1880**	**1900**	**1910**	**1930**	**1941**	**1956**
1	Păltiniş	-	-	-	228	-	-	288	301	131
2	Drăgoiasa	-	-	-	-	-	-	-	-	200
3	Catrinari	-	-	-	-	-	-	-	-	84
4	Glodu	-	-	-	-	-	-	249*	381*	363
5	Bilbor**	628	699	882	996	1283	1351	1670	2139	2253
6	Secu	-	-	-	-	-	-	-	-	-
7	Borsec	320	489	837	1116	1669	1862	2166	2247	2318
8	Corbu	702	878	975	1146	1333	1396	1571	1658	1908
9	Tulgheş	1240	1579	2168	2501	3053	3878	3883	4526	4719
Total		**2890**	**3645**	**4862**	**5987**	**7338**	**8487**	**9827**	**11252**	**11976**

Source: 1850, 1857, 1869, 1880, 1900, 1910, 1930, 1941, 1956 censuses. * Including Catrinari and Drăgoiasa hamlets; ** Including Secu hamlet, until 1956; - No data.

The numerical evolution of population in the Drăgoiasa-Tulgheş alignment between 1966-2002

Table 2

Crt. no.	Locality	Year			
		1966	**1977**	**1992**	**2002**
1	Păltiniş	-	131	108	100
2	Drăgoiasa	-	258	227	212
3	Catrinari	111	138	61	73
4	Glodu	436	447	317	318
5	Bilbor	2735	2930	2930	2859
6	Secu	-	-	82	84
7	Borsec	2750	2999	3074	2864
8	Corbu	2125	1755	1622	1601
9	Tulgheş	4659	4207	3780	3596
Total		**12816**	**12865**	**12201**	**11707**

Source: 1966, 1977, 1992, 2002 censuses, - No data.

This lead to a "*demographic ageing*", which in turn had negative effects on the natural population dynamics.

2. 2. The negative demographic trend during 1977-2010

The 1977-1992 phase registered the first demographic involution from 12 865 inhabitants in 1977 to 12 201 inhabitants in 1992, which means that in this 15 year interval the population of the space in question declined by 664 persons, with a decline rate for the entire period of -5.1% and an annual average decline rate of of - of some rural settlements (Păltiniş, Drăgoiasa, Catrinari, Glodu, Corbu and Tulgheş) or stagnation (Bilbor), due to lack of jobs, which caused the establishment in four neighbouring 11.4%, due to the depopulation urban settlements, during the early 70`s, of industrial facilities too large to be sustained with local work force.

Blocks of flats were built in the cities of Borsec (Borsecul de Jos) and Tulgheş without proper technical infrastructure. The signs of a crisis begin to appear at the beginning of the 80`s, and in 1990 the system collapses in these places, just like everywhere in Romania. Starting with the second half of the 80`s, the demographic behaviour of the population changes, very little at first, then more profound. After the 1989 Revolution, the evolution of the Drăgoiasa-Tulgheş population had a descending curve, due a low birth rate and due to emmigration, which can be clearly seen in the evolution of the following phased (1992-2002).

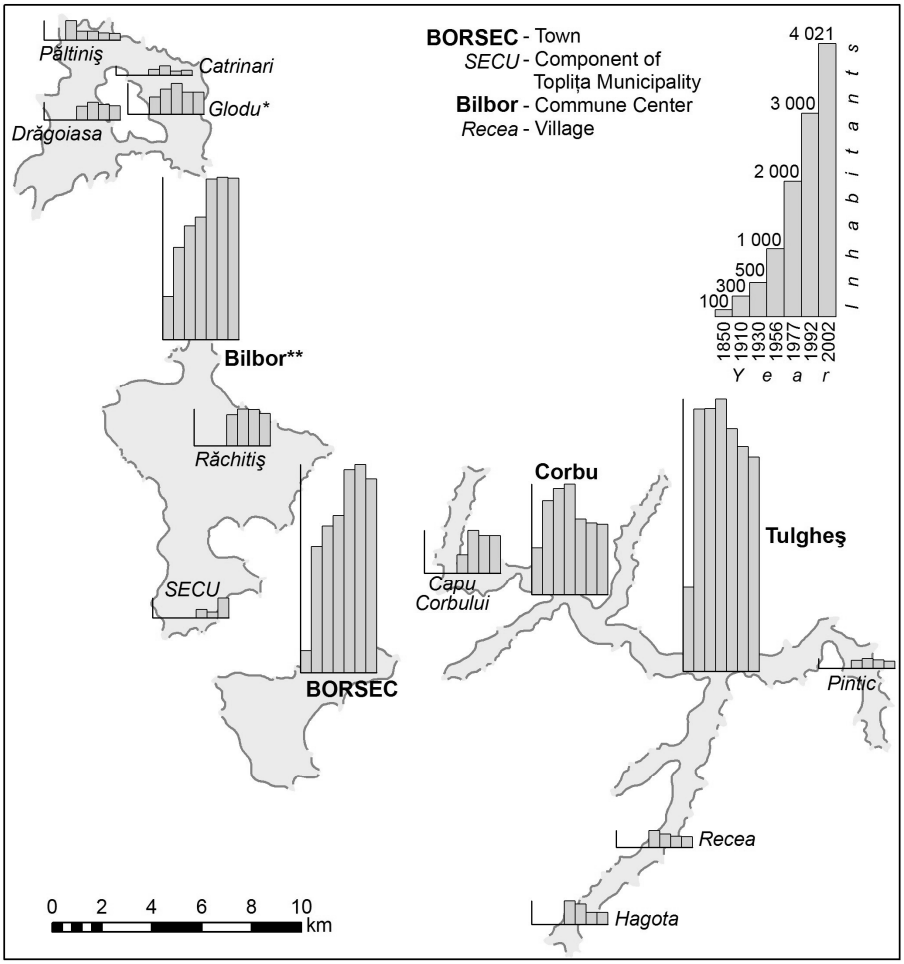

Fig. 1. The population of Drăgoiasa-Tulgheş Alignment at the 1850, 1910, 1930, 1956, 1977, 1992 and 2002 censuses, per town, commune, village.

The population only grew in Borsec by 249 inhabitants, from 2 999 inhabitants in 1977 to 3 074 inhabitants in 1992, resulting an annual average rate of 16.6 inhabitants and a growth rate for the entire period of 5.5% and an annual growth rate of 12%. In all rural settlements,

there was a decline in population, duen to migration to urban centres. The same period sees an intensification of the commuting phenomenon. The annual average rate therefore has negative values: -1 inhabitant (Păltiniş), -2 inhabitants (Drăgoiasa), -5 inhabitants (Catrinari), -8 inhabitants (Glodu), -8 inhabitants (Corbu) and -28 inhabitants (Tulgheş).

The annual average growth rate of Drăgoiasa-Tulgheş Alignment population (1850-2002)

Table 3

Phases	1850-1910	1910-1930	1930-1941	1941-1956	1956-1966	1966-1977	1977-1992	1992-2002
Phase duration (years)	60	20	11	15	10	11	15	10
Absolute evolution (inhabitants)	5597	1340	1425	724	840	47	-664	-494
Absolute growth rate (%)	193.6	15.7	14.5	6.4	7.0	0.3	-5.1	-4.0
Annual average evolution (inhab./year)	93.2	67.0	129.5	48.2	84.0	4.2	-44.2	-49.4
Annual growth rate (%)	9.1	14.7	27.5	13.2	21.4	-8.8	-11.5	-14.9

The 1992-2002 phase is defined by the so called *demographic erosion* process, with negative effects on the entire Romanian social system. Radical social changes occur, on a national level, determined by a series of factors, such as: the closing of many industrial units, population decline, intensification of the ageing phenomenon, unemployment, poverty, increase in death rate, decrease in average life span, etc.

In this 10 year period one can observe a massive population decline, firstly due to low birth rates and high death rates, as well as due to the emmigration of a significant number of inhabitants. The population decline reached values of 1.8…-17.5‰.

If in previous phases we had a rural exodus, in this phase we can also talk of a urban exodus, when a significant part of the laid off industrial workforce returned to their original homes in rural settlements. On the whole, the population decline in this interval (1992 - 2002) was of 494 persons, meaning -4% and a negative annual average rate of -14.8% (-49 inhabitants/year).

For each settlement we have the following situation: Păltiniş with -8 inhabitants absolute value (-7.4%) and -0,8 inhabitants annual average (-0.7%), Drăgoiasa -15 inhabitants absolute value (-6.6%) and -1.5 inhabitants annual average (-0.6%), Catrinari 12 inhabitants absolute value (19.6%) and 1.2 inhabitants annual average (1.9%), Glodu 1 inhabitant absolute value (0.3%) and 0.1 inhabitants annual average (0.03%), Bilbor -71 inhabitants absolute value (-2.4%) and -7.1 inhabitants annual average (-0.2%), Secu 2 inhabitants absolute value (2.4%) and 0.2 inhabitants annual value (0.2%), Borsec -210 inhabitants (-6.8%) and -21 inhabitants annual average (-6.6%), Corbu -21 inhabitants absolute value (-1.2%) and -2.1 inhabitants annual average (-0.1%) and Tulgheş -184 inhabitants absolute value (-4.8%) and -18.4 inhabitants annual average (-0.4%).

The last *phase 2002-2010*, analysed only at administrative unit level, is defined by a massive decline in population in depressions, mostly due to a low birth rate and high death rates, plus a negative migrating rate, which leads to continuous descending evolutionary curve.

During this period, we observe two phases, the first one from 2002 to 2007 in which the continuous decline tendency is obvious, the year 2008 with a slight increase, and then another phase with a more severe decline.

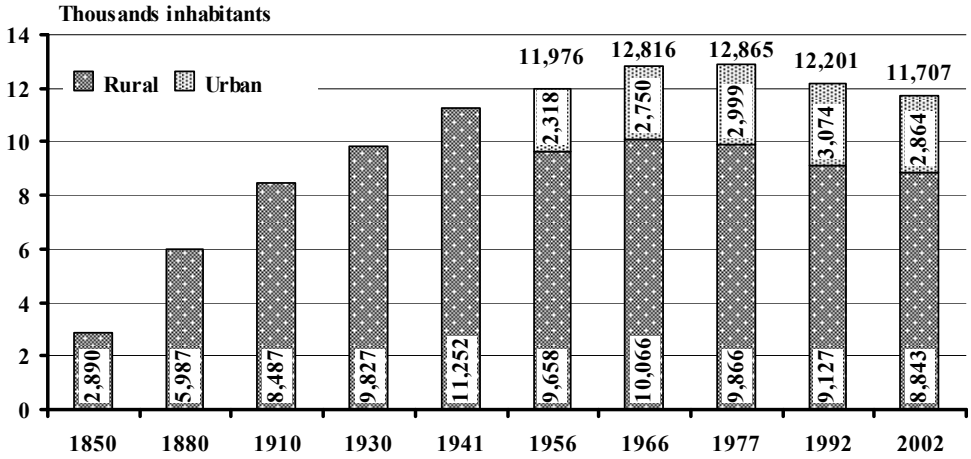

Fig. 2. The population evolution in the Drăgoiasa-Tulgheş Alignment during 1850-2002.

In this 8 year interval, the 4 studied localities saw a population decline from 10 920 inhabitants in 2002 to 10 224 inhabitants in 2010, which means a demographic deficit of 696 persons, a decline rate for the entire period of -6.3%, an annual average decline rate of -25.8% and an annual average rate of -69 inhabitants.

At locality level we have the following situation: Tulgheş had the greatest decline (374 persons), meaning -10.4% and an annual average rate of -34%. Bilbor and Borsec depressions registered a total decline with identical values of 120 persons (-4.1%) and an annual average rate of -19.2%, while Corbu registered a total decline of 48 persons (-3%) and an annual average rate of -14.7%;

The numerical evolution of the population of Bilbor, Borsec, Corbu and Tulgheş administrative units during 2002-2010

Table 5

Crt. no.	Loc.	2002	2003	2004	2005	2006	2007	2008	2009	2010
1	Bilbor	2859	2842	2816	2807	2782	2766	2730	2702	2705
2	Borsec	2864	2845	2838	2851	2792	2797	2965	2758	2744
3	Corbu	1601	1592	1588	1596	1592	1578	1566	1562	1553
4	Tulgheş	3596	3349	3329	3342	3315	3310	3328	3245	3222
Total		**10920**	**10628**	**10571**	**10596**	**10481**	**10451**	**10589**	**10267**	**10224**

Source: The National Institute of Statistics; Loc. = Locality.

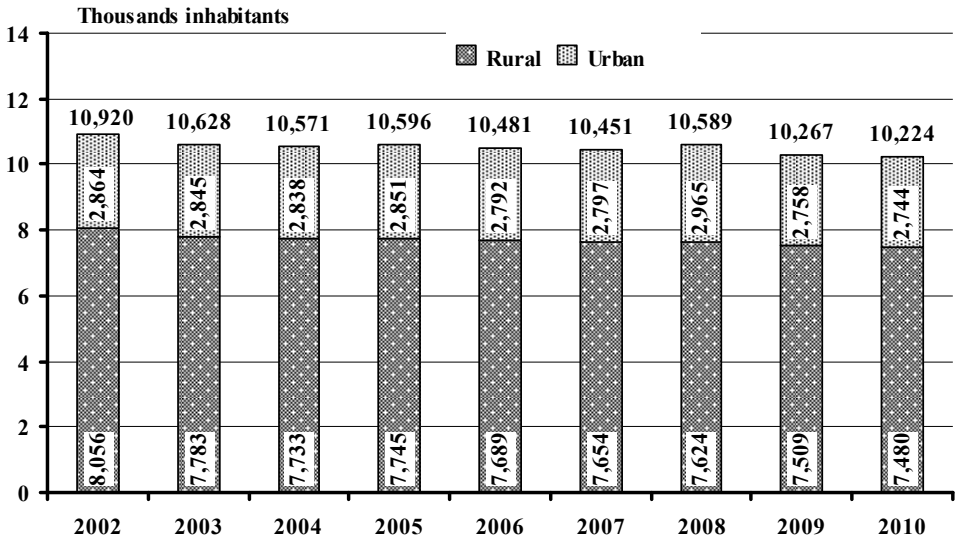

Fig. 3. The population evolution in the Bilbor, Borsec, Corbu and Tulgheş during 2002-2010.

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4. CONCLUSIONS

If we study the evolution of the population of the Drăgoiasa-Tulgheş Alignment during these 152 years (1850-2002) we can draw the following conclusions:

- we can easily distinguish two very distinct periods: the 1850-1977 interval, defined by a positive demographic evolution, with relatively short periods in which the population stagnated or slightly declined, as a result of subjective factors (the two world wars); and the 1977-2002 interval, defined by a continuous decline in population;
- within the regional microsystem, the population absolute growth was 8817 persons (305%), with an annual average evolution of 58 persons and an annual average rate of 3.8%;
- selectively analysing the 9 spatial components integrated in the microsystem, we observe the following for the entire period: in the Păltiniş Basin the population declined by 128 inhabitants (-56.1%), meaning an annual value of -1 inhabitant and an annual average rate of -3.3%; in the Drăgoiasa Depression the population grew by 12 inhabitants (6%), meaning by an annual value of 0.2 inhabitants and an average rate of 3.9%; in the Catrinari Basin the population declind by 11 inhabitants (-13%), meaning an annual value of -0.2 inhabitants and

an average rate of -5.7%; in the Glodu Depression the popualtion grew by 69 inhabitants (27.7%), that is with an annual value of 0.9 inhabitants and an average rate of 4.7%; in the Bilbor Depression the population grew by 2231 inhabitants (355.2%), that is with an annual value of 14.6 inhabitants and an average rate of 3.9%; in the Secu Depression, based on available data only from the 1992 and 2002 censuses, the population grew insignificantly by only 2 persons (2.4%), that is by an annual value of 0.2 inhabitants and an average rate of 9.2%; in the Borsec Depression the population grew by 2544 inhabitants (795%), that is an annual value of 16.7 inhabitants and an average rate of 4.5%; in Corbu the population grew by 899 inhabitants (128%), meaning and annual value of 6 locuitori and an average rate of 3.2%, and the in last locality, Tulgheş, the population grew by 2356 inhabitants (190%), with an annual value of 15.5 inhabitants and an average rate of 3.5%;

- in the cartogram from figure 1, we can observe that in two of the analysed localities there was a negative annual average evolution: Păltiniş (-56.1%) and Catrinari (-13%); three of the settlements have percentages between 0.1-100%: Secu (2.4%), Drăgoiasa (6%) and Glodu (27.7%); the largest annual average growth (over 100%) took place in four of the existent localities Corbu (128%), Tulgheş (190%), Bilbor (355.2%) and Borsec (795%).

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THE EVOLUTION AND STRUCTURES OF POPULATION OF SOMEŞ VALLEY MICROREGION, WITHIN THE PERIOD 1992 - 2009

GEORGIANA BOSIOC[1]

ABSTRACT. – The Evolution and Structures of Population of Someş Valley Microregion, within the period 1992-2009. The geodemographic resources are a dynamic part of a system, all changes that occur over time are determined and conditioned by the quality of the population and by the capacity of communities to "regenerate". Someş Valley microregional system is a deep rural area, facing a number of weaknesses in human resources, in fact, like all the Romanian rural areas. The accelerated decline in the number of inhabitants, by 20.2% between 1992-2009, resulted in the degradation of the quality of population (structures), a series of geodemographic and social risks starting to take shape in the space marked by rurality. The study of geodemographic components of the microregional space has two aspects: one related to the numerical component (total population), which expresses the quality of labour and the potential consumption of goods and services in an area and the other one related to the structural component, which expresses the quality and variety of social, cultural and economic activities of the area. Determining the state of the geodemographic component of a territorial system is a primary condition in the process of spatial planning and landscaping, the geodemographic resources being the cause and effect couple over which all changes that, in time, put their mark on the territorial system are reflected.

Keywords: *Someş Valley Microregion, geodemographic structures, 1992-2009 period.*

1. INTRODUCTION

Someş Valley Microregion occupies the North-East area of the county of Sălaj being composed of nine communes, with a total of 54 villages and a population of 14 437 in 2009. The Microregion borders two counties, the county of Maramureş to the North and the county of Cluj to the South-East, which can be considered an advantage in terms of the possibility of networking with other communities, but also a disadvantage because the location of a territory on the periphery/outskirts of an administrative - territorial unit raises the question of isolation and remoteness from the "centre". The characteristics of the studied microregional area, determined by the position potential are also reflected on the dynamics and quality of geodemographic resources. The accelerated decline in the number of inhabitants and the intense processes of depopulation and geodemographic aging are mostly due to the lack of development prospects of rural areas, and also to positioning Someş Valley Microregion at a relatively short distance from the urban growth and development poles (Cluj-Napoca, Baia Mare, Satu Mare, Oradea), thereby facilitating the continual migration flows, especially of young people, from the adjacent rural areas.

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2. THE NUMERICAL EVOLUTION

The analysis of the population of Someş Valley Microregion is done for the period 1992-2009, aiming to highlight the decreases/increases in the number of inhabitants in certain time periods correlated with the socio-economic context. The situation of the two time periods show a reduction in the number of inhabitants by 9.3% between 1992-2002 and by 12.2% between 2002-2009. Thus, over a period of 17 years, the number of population decreased from 18 105 in 1992 to 14 437 in 2009, causing a downward continual trend of the population in this microregion, that was deeper between 2002-2009.

The predominantly agrarian economy of this microregion experienced a period of regression after the fall of communism, which led to a high migration from rural to urban neighbourhoods (Cluj-Napoca, Baia Mare, Dej, Zalău, Jibou) on the chance of filling a job in other sectors of national economy.

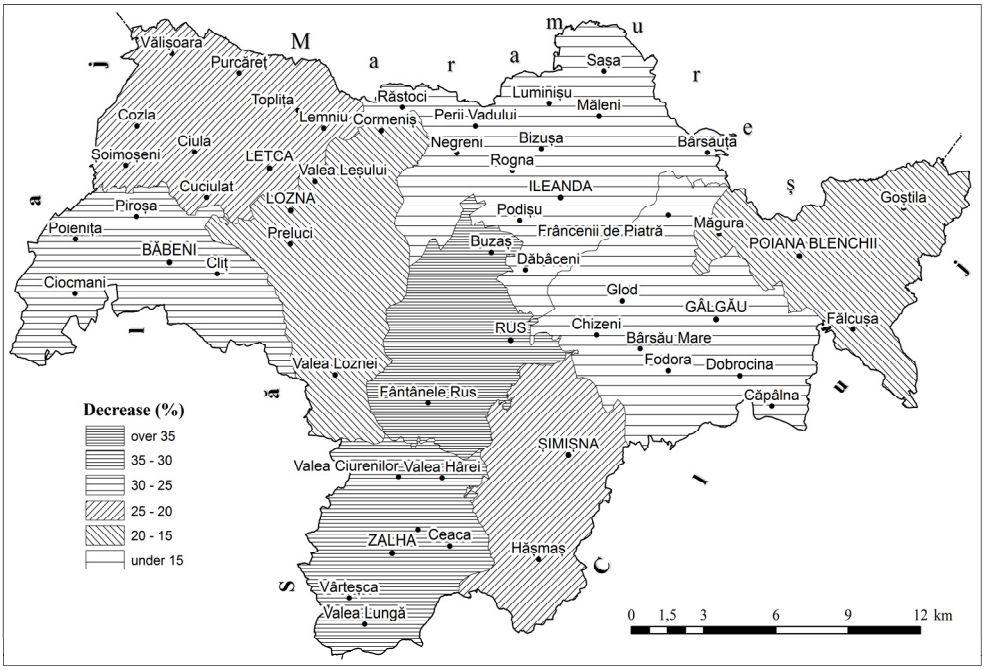

Fig. 1. Someş Valley Microregion. Evolution of the number of inhabitants, within the period 1992-2009.

In the administrative-territorial units a general population decline is also recorded, all the communes of the microregion showing significant loss of population between 1992 and 2009: Rus 60.8%, Zalha 33.9%, Băbeni 26.0%, Letca 23.8%, Poiana Blenchii 19.3%, Lozna 16.8%, Gâlgău 14.3%, Ileanda 14.0%. A thing to mention is that the large share in the decrease of the number of inhabitants of Rus commune is explained by the fact that by 2002 it also encompassed the territory of the current Şimişna commune. Şimişna commune registered a reduction of population by 21.2% over seven years, since 2002, when it became a commune.

The largest population losses are recorded by the communes located peripherally to the main access roads, these communes being in fact the least developed in terms of economy. This is the case of Zalha, Rus, Poiana Blenchii, Lozna and Şimişna communes located peripherally to the anisotropic axis of Someş Valley. The communes of Băbeni and Letca also show high values of the reduction in the number of inhabitants due to population migration, especially to Jibou town located in the immediate vicinity.

The evolution of the number of people follows closely the evolution of natural dynamics, especially of territorial mobility, both processes leading to some specificity in the evolution of the number of people, both in the microregion and in the territorial-administrative units.

The components of the natural growth of the population of Someş Valley Microregion, in the years 1992, 2002 and 2009

Table 1

Communes	1992			2002			2009		
	B	M	Ni	B	M	Ni	B	M	Ni
	‰			‰			‰		
Băbeni	3.7	28.4	-24.7	10.3	27.5	-17.2	5.6	27.4	-21.8
Gâlgău	9.3	18.3	-9.0	11.5	18.9	-7.4	8.9	23.9	-15
Ileanda	12.0	26.2	-14.2	12.2	21.1	-8.9	17.4	19.9	-2.5
Letca	7.9	20.3	-12.4	7.1	23.1	-16	9.3	22.5	-13.2
Lozna	7.9	26.1	-18.2	7.0	19.3	-12.3	9.7	23.3	-13.6
Poiana Blenchii	11.7	16.9	-5.2	8.3	24.9	-16.6	12.9	14.5	-1.6
Rus	0.3	17.1	-16.8	1.6	42.4	-40.8	1.6	13.6	-12
Şimişna*	-	-	-	1.6	42.4	-40.8	9.2	17.6	-8.4
Zalha	12.2	21.0	-8.8	11.1	24.8	-13.7	9.3	35.1	-25.8
Microregion	**8.1**	**21.7**	**- 13.6**	**7.8**	**27.1**	**- 19.3**	**9.3**	**21.9**	**-12.6**

*Included to the Rus commune until 2002.

Note: **B**= Birth rate; **M** = Mortality rate; **Ni** =Natural increase rate.

The natural dynamics of population is reflected by analyzing the three indicators: birth, death and natural increase, taking into account the determination of trends in human capital, and the spatial distribution of geodemographic structures.

In the microregion a decrease in birth rate was recorded between 1992-2002 and an increase between 2002-2009. Thus, in 1992 the rate of birth was 8.1‰, while the rate of mortality was almost three times higher, 21.7‰. Thus, a negative growth of -13.6‰ resulted in 1992, a rate which decreased significantly in 2002 to -19.3‰.

In 2009 there is an "improvement" in the rate of natural growth as compared to 2002, determined on the one hand by an increase of 1.5‰ of the rate of birth and on the other hand by the decrease of mortality to 21.9‰.

In the communes, the birth rate dynamics is increased, only one commune registered trends of increasing birth rate in all three temporal moments (Ileanda) and Zalha commune registered a gradual reduction of birth rate from 12.2‰ in 1992 to 9.3‰ in 2009. Letca, Lozna and Poiana Blenchii communes recorded a reduction in birth rates between 1992-2002 and an increase between 2002-2009, and Băbeni and Gâlgău communes went through the opposite process, the growth of birth rate between 1992-2002 and its reduction between 2002-2009.

In terms of mortality high levels of this indicator are recorded throughout the 17 years, only two of the nine communes of the microregion showing tendencies to reduce mortality in all three temporal moments of the analysis (Ileanda and Băbeni). High values of mortality are due to the fact that for most communes people aged over 60 years exceeds 35% of the total population. In 1992 the commune of Băbeni registered the highest rate of mortality (28.4‰), a rate that decreases slightly both in 2002 (27.5‰) and in 2009 (27.4‰). In 2002 a problematic situation is presented by Rus and Şimişna communes, they both recording a high rate of mortality of over 40‰, but it decreased significantly in 2009, to 13.6‰ for Rus communes and to 17.6‰ for Şimişna commune. In 2009 the highest rate of mortality is characteristic for Zalha commune (35.1‰) and lowest rate for Rus commune, 13.6‰.

As a result of the two indicators (births and deaths), the population growth shows their evolution over time. In the microregion there is a negative growth of -13.6‰, in 1992, of -19.3‰ in 2002 and of -12.6‰ in 2009. The small value of natural increase in 2002 is caused by a high mortality rate and a low number of births (this is the year when the lowest birth rate has been recorded and the highest mortality rate between 1992-2009).

Thus in all communes negative rates of natural growth are recorded in all three temporal moments, but 2002 is the most problematic because there of the lowest values registered in the range of natural increase from 1992 to 2009. For Rus and Şimişna communes the natural growth was -40.8‰, as determined by the very high mortality rates and by the reduced number of births.

Only Poiana Blenchii and Gâlgău communes presented in 1992 rates of natural increase below -10‰, the rest of the communes falling between the spread of -10 and -25‰. In 2009, in the microregion, population growth seems to improve as compared to 2002, but in the commune the situation is diverse, only five communes showing higher rates of natural increase: Lozna -13.6‰, Letca -13.2‰, Rus -12‰, Şimişna -8.4‰, Ileanda -2.5‰, Poiana Blenchii -1.6‰.

The negative values of natural increase are due to several causes, including the overall decrease of population caused by young people migration.

The migratory growth in the microregion also registers negative values, the number of left people being higher than the number of arrived people, stating that the analysis on this indicator does not include the external migration of population. Thus, in the microregion the migratory growth registered rates of -42.0‰ in 1992, -10.0‰ in 2002 and -20.0‰ in 2009. Thus, a migratory increase with an ascending trend results for the period 1992-2002 and a descending trend for the period 2002-2009.

In 1992 Zalha commune presented a negative migratory growth of -85.7‰, the lowest rate recorded on this indicator, but it improved in 2002, when a negative migratory growth of -17.05‰ was recorded. Three communes registered in 1992 rates of the migratory growth above -50‰ (Lozna -58.5‰, Letca -53.1‰, Gâlgău -51.6‰) and Băbeni and Poiana Blenchii communes registered a negative migratory increase of -25,8‰ and -33.2 ‰, respectively. For 2002, although the situation is improved for some villages, the migratory growth remains negative for almost all the communes of the microregion: Rus -22.9‰, Băbeni -22.4‰, Şimişna -18.1‰, Letca -17.8‰, Poiana Blenchii -15.7‰, Lozna -8.7‰. Positive values of the migratory growth in 2002 were registered in Ileanda and Gâlgău communes, 28.5‰, and 4.5‰, respectively. In 2009, Rus commune experiences a marked decrease of -57.7‰ in the migratory growth rate.

Only one commune (Ileanda) has positive values of the migratory growth in both 2002 and 2009, of 28.5‰, 25.4‰, respectively. This positive migration balance can be explained by the fact that Ileanda is a place with opportunities, while being at the same time the inter-village centre of this microregion, having specific features.

It can be concluded therefore that there is a balance in the general demographic dynamics, the loss of human capital being equally accomplished by the two dimensions of demographic dynamics, natural dynamics and territorial mobility.

3. POPULATION STRUCTURE BY GENDER

The population structure by gender highlights aspects of the quality of demographic structures, the existence of a balance between the rate of female and male population being essential to ensure a qualitative demographic capital.

In Someş Valley Microregion the rate of females out of the total population shows to have a tendency to increase from 51.5% in 1992 to 53.4% in 2009. In 1992 only Rus, Poiana Blenchii and Gâlgău communes, presented a balance between the two groups of genders. In 2002 Zalha and Gâlgău communes registered values that were relatively close to the two gender groups, and Rus commune presented a deeply unbalanced situation registering a rate of 65.8% of female population, a percentage that remains almost unchanged in 2009 too, of 64.2 % female population.

Population Structure by Gender and index of feminity, at the level of communes, in the years 1992, 2002 and 2009

Table 2

Communes	1992			2002			2009		
	M	**F**	**If**	**M**	**F**	**If**	**M**	**F**	**If**
Băbeni	1167	1268	108.7	963	1085	112.6	835	966	115.7
Gâlgău	1427	1461	102.4	1325	1364	102.9	1190	1283	107.8
Ileanda	1319	1426	108.1	1191	1267	106.4	1147	1213	105.8
Letca	1258	1417	112.6	1037	1203	116.0	951	1086	114.2
Lozna	596	660	110.7	559	586	104.8	486	549	113.0
Poiana Blenchii	762	772	101.3	649	681	104.9	602	635	105.5
Rus	1540	1560	101.3	416	802	192.8	435	779	179.1
Şimişna*	-	-	-	772	810	104.9	638	670	105.0
Zalha	707	765	108.2	579	594	102.6	483	489	101.2
Microregion	**8776**	**9329**	**106.6**	**7491**	**8392**	**116.4**	**6767**	**7670**	**116.3**

* Included to the Rus commune, until 2002. Note: **M**= male population; **F**= female population; **If**= Index of feminity (women at 100 men).

A more specific indicator for the analysis of population by gender is the index of femininity, which is relevant for determining the geodemographic risk. The differences of more than 2% between the percentage of female and male population are considered to be

imbalance, which is why the phenomenon of feminization of the population arises, with implications for the current demographic structues, but especially for the future ones.

In the microregion there is a general trend of increase of the index of femininity between 1992-2002, according to the increase of the female population, from 106.6 women/ men in 1992 to 116.4 women/100 men in 2002. In the next seven years the femininity index recorded a slight decrease of only 0.1%.

Thus, all the territorial-administrative units included in the study show a high feminization of the population, but with differences in areas, due to the lower life expectancy of men, but also to the migration of men to work mainly outside of the microregion.

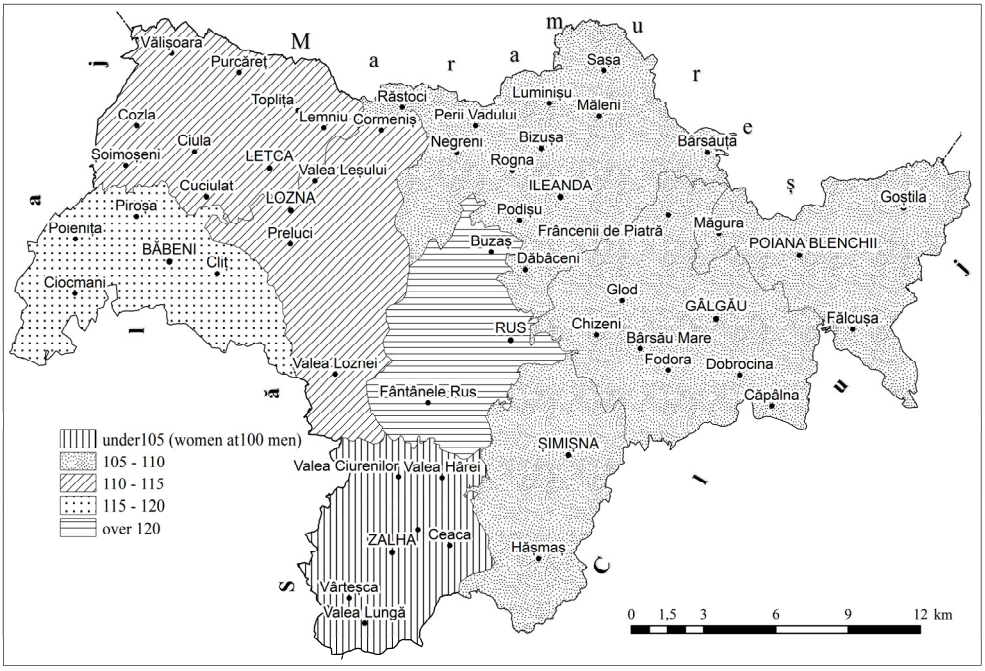

Fig. 2. Someş Valley Microregion. Index of feminity at the level of communes in 2009.

In 2009 in the communes the situation of the index of feminization was as follows: Şimişna 105.0 women/100 men, Zalha 101.2, Poiana Blenchii 105.5, Ileanda 105.8, Lozna 113.0, Băbeni 115.7, Letca 114.2, Gâlgău 107.8 and Rus 179.1 women/100 men. Rus commune presents a critical situation, because it has a population dominated by women both in 2002 and 2009, but with a reduction of 13.7% as compared to 2002.

4. POPULATION STRUCTURE BY AGE

The structure by age shows a general trend to reduce young people (0-19 years), and a significant increase in the share of the structure of elderly population (≥ 60 years), representing 33.8% of the total population in 1992, 31.0% in 2002 and 38.4% in 2009. The group of young population (0-9 years) is gradually reduced from 18.2% in 1992 to 16.8% in 2009.

The result is a regressive type of age pyramid, with a narrow base and a bold top, which indicates a high ratio of economic dependence, exercised mainly by the older people and a shortage of young labour that should support the economy of the region.

Regarding the communes, in 2009 the situation is quite nuanced in terms of the share of the elder group, in Poiana Blenchii, Zalha, Şimişna and Letca communes, the share of this age group exceeded 40% of the total population. A lower share of elder people in the population structure (between 30-40%) is observed in Băbeni, Lozna, Gâlgău, Ileanda and Rus communes. Thus, for all villages the share of elder people increased between 1992-2009 by 10.1% for Băbeni, by 4.3% for Gâlgău, by 4.7% for Ileanda, by 0.6% for Letca, by 5.2% for Lozna, by 1.1% for Poiana Blenchii, by 7.3% for Rus and by 0.5% for Zalha.

Age Structure of Population in Someş Valley Microregion, between 1992-2009

Table 3

Communes	Years	No. inhab.	Age groups (%):		
			0-19 years	20-59 years	≥60 years
Băbeni	1992	2435	19.7	53.2	29.5
	2009	1801	16.2	46.6	36.6
Gâlgău	1992	2888	21.4	52.2	28.4
	2009	2473	19.2	48.1	32.7
Ileanda	1992	2745	20.9	50.3	28.8
	2009	2360	19.7	46.8	33.5
Letca	1992	2675	16.2	43.2	40.6
	2009	2037	15.9	42.9	41.2
Lozna	1992	1265	15.0	52.8	32.2
	2009	1035	14.3	48.3	37.4
Poiana Blenchii	1992	1534	18.3	40.5	41.2
	2009	1237	16.7	41.0	42.3
Rus	1992	3100	19.8	51.7	28.5
	2009	1214	17.1	47.1	35.8
Şimişna	1992	-	-	-	-
	2009	1308	15.9	41.3	42.8
Zalha	1992	1472	15.4	42.3	42.3
	2009	972	15.6	40.6	43.8
Microregion	**1992**	**18105**	**18.2**	**48.0**	**33.8**
	2009	**14437**	**16.8**	**44.8**	**38.4**

The share of young population in 2009, has higher values in the communes of Gâlgău (19.2%), Ileanda (19.7%) and Rus (17.1%), and the lowest values in Lozna (14.3%), Zalha (15.6%), Letca (15.9%), Şimişna (15.9%), Băbeni (16.2%) and Poiana Blenchii (16.7%) communes.

As a consequence of this structure of population by age groups, in the future there will be a series of changes due to the current aging of population and to the plummeting decrease of natural growth. Therefore, there will be such imbalances in labour planning and forecasting, because most of the currently working population will be retired over 20 years, creating a high demographic pressure on the working population, reduced in number. Also, there will be weaknesses in educational planning, in the specific of consumption and in the organization of service activities.

The *demographic risk* is the possibility of a continuing deterioration of the steady states in the functioning of the demographic system, with a negative impact and a gradual manifestation. Therefore risk management is being increasingly focused upon, which involves the systematic approach of various mechanisms (legal, organizational, economic, engineering) to solve the problems of risk prevention and mitigation up to a considerably attenuated level.

To highlight the geodemographic risk for Someş Valley Microregion a range of indicators are taken into account, including the population aging index (I = P ≥ 60 / P ≤ 19), calculated as the ratio between the share of the elder group (≥ 60 years) and the share of the young group (0-19 years).The threshold value of demographic aging index is 0.42, over this value the population receiving the feature of aged population.

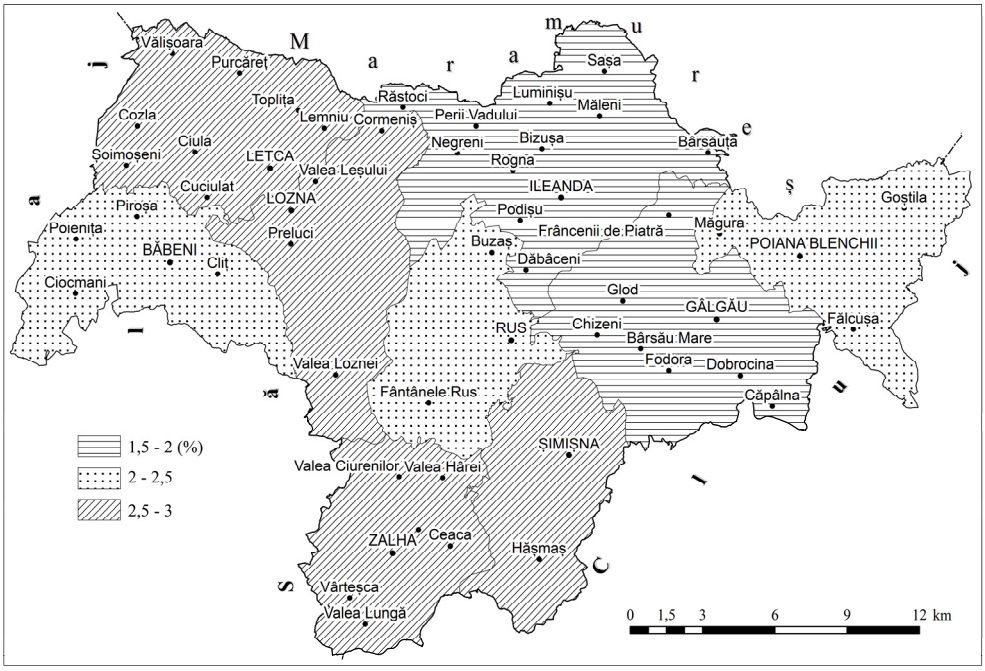

Fig. 3. Someş Valley Microregion. Population Aging Index at the level of communes in 2009.

The aging rate of the population in the microregion registered values of 1.9 in 1992 and of 2.3 in 2009. Thus, there is a general trend of demographic aging, its values hovering well above the threshold value of 0.42 in 2009 and in the previous years.

In the communes in 2009, the aging index value is very high for Zalha 2.8, Şimişna 2.7, Lozna 2.6, Letca 2.6, Poiana Blenchii 2.5, Băbeni 2.2, Rus 2.1 and with values between 1.7-2.0 for the other communes.

Another indicator relevant to demographic risk highlighting is the economic dependency ratio (RD), calculated by reporting extreme age groups in adult age group, theoretically expressing the pressure exerted by dependents on the population able to work (potentially active):

$$RD = \frac{P\ 0\text{-}19\ years + P \geq 60\ years}{P\ 20\text{-}59\ years} \times 100\ (\%)$$

In the microregion the economic dependency ratio follows the general trend of the population aging index, is growth, exerting a pressure of 110.4 dependents per 100 working persons in 1992 and of 124.5 dependents per 100 working persons in 2009. The demographic pressure is created in this case by the elder persons, they holding more than 14% of the total population (12 to 14% is the threshold for considering a population as aged or aging).

In some communes in 2009 the situation is even more worrying, the economic dependency ratio being very high for Zalha 146.3%, Poiana Blenchii 143.9%, Şimişna 136.4% and Letca 133.1%. The other communities have economic dependency ratio values between 100 and 115 dependents per 100 working people.

5. ETHNIC STRUCTURE OF POPULATION

The analysis of ethnic and confessional structure of population shows the cultural diversity of a community, and also provides information on the characteristics of that community.

The ethnic structure of Someş Valley Microregion is less diverse, at the census of 1992 Romanians accounting for 97.2% of the total, followed by Romas with 2.4%, Hungarians holding the smallest share of just 0.4%. In administrative units the share of Romanians exceeded 99% for the more remote communes (Zalha 99.9%, Letca 99.5%, Băbeni 99.8%), only Ileanda and Gâlgău communes having lower population shares of Romanian ethnicity, of 92.8%, and 94.6%, respectively.

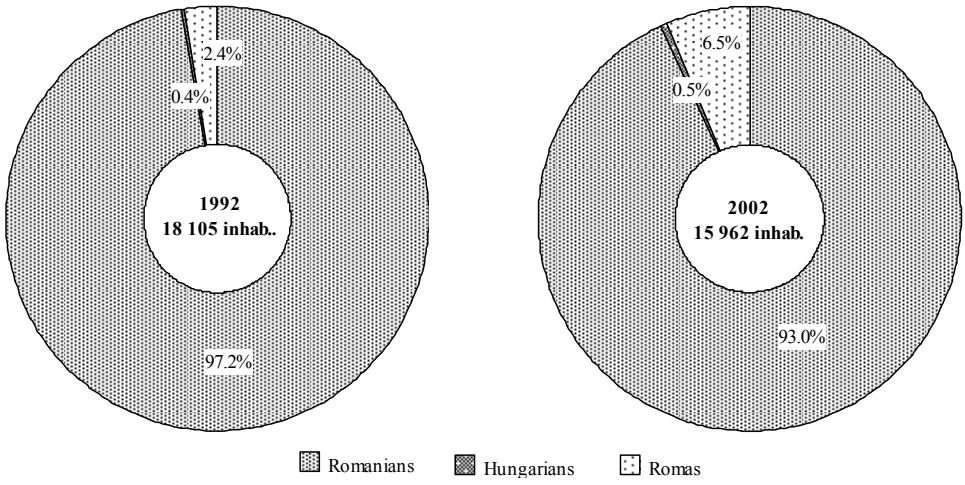

Fig. 4. The Ethnic Structure of Population of Someş Valley Microregion in the years 1992 and 2002.

For the rest of the communes in 1992 the share of Romanians in the ethnic structure is between 96-98%.

In 2002 the ethnic structure shows changes, in all administrative units the share of the Romanians being reduced, against the increasing number of Roma people, also for some communes of people of Hungarian ethnicity. In the microregion, in 2002 Romanians accounted for 93.0%, Hungarians 0.5% and Roma 6.5%.

There is a significant increase of the share of Romas in the ethnic structure of population between 1992-2002: Băbeni from 0 in 1992 to 2.6% in 2002, Letca from 0.4% to 2.1%, Gâlgău from 4.3% to 10.4%, Ileanda from 6.2% to 12.6%, Poiana Blenchii from 3.0% to 9.7%, Rus from 2.3% to 10.1% and Zalha from 0 to 2.2%. Lozna commune, according to statistical data, showed a decline in the share of Roma population in this period, from 1.6% to 1.1%.

The Ethnic Structure of Population in Someş Valley Microregion, between 1992-2002

Table 4

Communes	Years	No. inhab.	Romanians	%	Hungarians	%	Romas	%
Băbeni	1992	2435	2429	99.8	6	0.2	-	-
	2002	2047	1991	97.3	1	0.1	55	2.6
Gâlgău	1992	2888	2731	94.6	34	1.2	123	4.3
	2002	2689	2374	88.3	35	1.3	280	10.4
Ileanda	1992	2745	2547	92.8	28	1.0	170	6.2
	2002	2458	2136	86.9	12	0.5	310	12.6
Letca	1992	2675	2662	99.5	2	0.1	9	0.4
	2002	2240	2186	97.6	8	0.4	46	2.1
Lozna	1992	1256	1234	98.2	2	0.2	20	1.6
	2002	1145	1131	98.8	1	0.1	13	1.1
Poiana Blenchii	1992	1534	1487	96.9	1	0.1	46	3.0
	2002	1330	1194	89.8	7	0.5	129	9.7
Rus	1992	3100	3024	97.5	5	0.2	71	2.3
	2002	1218	1089	89.4	6	0.5	123	10.1
Şimişna	1992	-	-	-	-	-	-	-
	2002	1662	1599	96.2	5	0.3	58	3.5
Zalha	1992	1472	1470	99.9	2	0.1	-	-
	2002	1173	1144	97.6	2	0.2	26	2.2
Microregion	**1992**	**18105**	**17586**	**97.2**	**80**	**0.4**	**439**	**2.4**
	2002	**15962**	**14845**	**93.0**	**77**	**0.5**	**1040**	**6.5**

Although in the mircoregion the share of the Hungarians stagnated between 1992-2002, four communes showed increases in this ethnicity: Letca, Poiana Blenchii and Rus, the other communes registering losses in the share of population of Hungarian ethnicity.

6. DENOMINATIONAL STRUCTURE OF THE POPULATION

The denominational structure is rather diverse in the microregion, but the largest share is held by the Orthodox, both in 1992, 90.3% and in 2002, 85.7%. The Pentecostals follow in terms of share, the Greek Catholics, the Baptists, the Roman Catholics and the Reformed, the latter accounting for the smallest share.

There is an interesting situation in the ethnic and denominational structure, there being an obvious correlation between them. The population of Romanian ethnicity is Orthodox and Greek Catholic in majority and the Roma population is Pentecostal and Baptist in majority. The more remote communes (Zalha, Şimişna) are much more ethnically homogeneous, which also determines the homogeneity of religion.

Confessional Structure of Population in Someş Valley Microregion, between 1992-2002

Table 5

Communes	Years	No. inhab.	Religious affiliation (%):					
			Orthodox	Roman Catholics	Greek Catholics	Reformed	Baptists	Pentecostals
Băbeni	1992	2435	90.1	0.1	7.4	0.1	0.2	2.1
	2002	2047	87.5	-	7.7	0.2	-	4.6
Gâlgău	1992	2888	92.8	0.7	1.9	0.4	1.6	2.6
	2002	2689	87.9	0.1	2.0	0.1	2.3	7.7
Ileanda	1992	2745	87.0	0.6	5.2	0.8	1.0	5.4
	2002	2458	80.7	0.4	7.5	0.5	0.3	10.6
Letca	1992	2675	91.1	0.2	5.4	-	3.3	-
	2002	2240	85.2	0.6	7.6	0.1	-	6.5
Lozna	1992	1256	91.8	-	1.6	0.2	0.1	6.3
	2002	1145	86.5	0.5	0.1	-	-	12.9
Poiana Blenchii	1992	1534	86.2	-	0.8	-	3.3	9.7
	2002	1330	85.5	-	-	-	1.0	13.5
Rus	1992	3100	89.5	1.6	1.5	0.1	0.2	7.1
	2002	1218	85.0	-	7.8	0.2	-	7.0
Şimişna	1992	-	-	-	-	-	-	-
	2002	1662	84.5	0.3	4.3	0.1	2.6	8.2
Zalha	1992	1472	94.3	0.1	3.5	-	-	2.1
	2002	1173	94.4	-	1.0	-	-	4.6
Microregion	**1992**	**18105**	**90.3**	**0.5**	**3.6**	**0.2**	**1.2**	**4.2**
	2002	**15962**	**85.7**	**0.2**	**4.8**	**0.2**	**0.8**	**8.3**

Between 1992-2002 the neo-Protestant denominations (Pentecostal and Baptist) saw increases in the number of followers, in some communes the Pentecostals shared over 10% of the total population in 2002 (Ileanda 10.6%, Lozna 12.9%, Poiana Blenchii 13.5%). The Greek Catholic denomination is well represented in the microregion, accounting for the year 2009, 3.6% of the population.

The most ethnically diverse in the year 2002 is Ileanda commune, the religious structure being as follows: 80.7% Orthodox, 0.4% Roman Catholic, 7.5% Greek Catholic, 0.8% Reformed, 0.3% Baptist and 10.6% Pentecostal.

An important issue of the ethnic and denominational structure may be mentioned for Ileanda village, which in the 1930s had a large community of Hebrew, about 400 people. Currently in the village there is no person of Hebrew ethnicity, but there are elements of culture, particularly housing estates and public-use buildings.

The synagogue is no longer preserved, being demolished during the Second World War. Today the same situation occurs in the ethnic Hungarian population too, the disappearance of Hungarians of the ethnic structure of some villages entailing consequences on the elements of culture of this ethnicity (customs, traditions, places of worship, etc.).

7. CONCLUSIONS

The decrease in number of people, labour migration, population aging, negative natural growth are processes that are determined by the socio-economic context faced nationwide after 1989. The consequences of such occurred geodemographic movements will be reflected on the short, medium and long term, their decrease depending on the measures taken by authorities in planning and landscaping process.

In conclusion, based on the demographic dynamics analysis of Someş Valley microregion there is a gradual involution of the number of inhabitants between 1992-2009, driven by a (total) *negative demographic balance,* of -39.1‰, representing the result of natural dynamics and migration of population. The result is a regressive type population, which showed a continuous degradation in the last 17 years. The current situation of the population in this microregion shows an emphasized aging of the population and a high rate of geodemographic dependency, which are long-term risks that will worsen the demographic crisis of the countryside.

The *demographic isolation and the rural depopulation* are also two processes that affect a growing number of settlements of the microregional rural system as they have limited facilities and services and are isolated from the main access roads and from their own village centre. Two of the villages of Ileanda have a small number of inhabitants, aged over 65 (Bârsăuța village has 10 inhabitants and Măleni 3 people). The same happens with Frâncenii de Piatră and Gura Vlădesei villages (Gâlgău commune) with more than 19 people each.

The depopulations and population migrations outside the microregion are also caused on the one hand by the absence of a polarizing centre with complex functions that should meet various socio-economic needs of the population. Ileanda, although is a centre for neighbouring villages, only provides polarizing educational functions and, to a limited extent, business functions.

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GEOGRAPHIES OF FEAR AND HOPE IN THE NEPALESE SOCIETIES OF POST~PEOPLE'S MOVEMENT, 2006

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ABSTRACT. – Geographies of Fear and Hope in the Nepalese Societies of Post~People's Movement, 2006. The concept of geographies of fear and hope seeks to assess both claims of fear and hope from a critical and grounded geographical perspective. Nepali societies are fascinated by not only diversities in topography and climate, but also complexities and disparities generated due to the politico~socioeconomic~cultural and developmental processes. As a result, it is grounded for vivid fears and hopes unevenly across places and societies. The people's movement, 2006 was grounded with the fear of insecure basic human rights, freedom and democracy, and with the sensible hopes of a peaceful-democratic-Nepal. The Comprehensive Peace Accord has intended to end the fears of the conflicts continued for a decade in the country and also anticipated hopes to accomplish the progressive restructuring of the state in order to solve the class-related, ethnic, regional and gender problems of the country. However, the anticipated hopes further dwindled into numerous forms and complexities. Currently, Nepal is in serious crisis with threats of its existence as an independent, indivisible, sovereign, secular, inclusive and democratic nation.

Keywords: *fear and hope, people's movement, discourse, diversity, disparity, crisis.*

1. INTRODUCTION

Geography is an eclectic discipline, covering both the social and the physical, and placing both in landscape (Klinkenberg, 2007). The major focus of investigation in geography is the exploration of the society: what makes it and what informs it. Sui (2004) points out that "geography is well positioned to play a leading role in the third culture [one that joins science and literature] if we can combine analysis with synthesis, scientific rigor with artistic sensitivity, and pure intellectual pursuits with dominant social concerns of our time". Hence, it is an ethical imperative for geographers to examine the often unnoticed space-making processes and space-forming assumptions to claim specific geographic truth. Further, they can use their knowledge and tools for a better world, of course, to harness for the good of society.

The Association of American Geographers (AAG) in 2005 initiated the discourse of fear and hope and its theoretical and analytical potentials for research. Claims of both fearful and hopeful pronouncements could be assessed from a critical and grounded geographical perspective. A broader range of geographic research on such issues can move us beyond fear and toward constructive and hopeful interventions in our world (Lawson, 2007).

2. THE DISCOURSE ON GEOGRAPHIES OF FEAR AND HOPE: AN OVERVIEW

Hope and fear are huge swirling compulsions with enormous implications for the lives and deaths of every living thing on this planet (Spark, 2007). The Cambridge dictionary has defined fear as an emotion caused by the threat of danger, pain or harm. Fear is produced

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through tropes of nationalism, feeling of economic marginalization, dissatisfaction of derailing from mainstream, loss of territory, and anxieties about invasion of home (Hyndman, 2007). Further, according to Lawson (2007), the expansion of fears seems to arise from many other sources such as threats of natural disasters, global climate change, and health pandemics now occur alongside geopolitical fear mongering and growing apprehensions about inequality, social justice, and political instability. Similarly, hope is defined as a feeling of expectation and desire for a particular thing to happen (Cambridge dictionary). Lawson (2007) expresses that the hopeful messages are emerging from all across the political spectrum as antidotes to fear.

Geographic research has investigated the myriad threats we face in political, social, economic, environmental, and technological realms from a community at micro level to international level. Spark and Hyndman pointed to the ways in which both fearfulness and hopefulness are deployed politically in the context of national and international conflicts and struggles over security, democracy, and development. Spark (2007) illustrated the case of the Iraq war with groundless geopolitical fear about Iraq's weapons of mass destruction and Al Qaeda connections combined with equally groundless geoeconomic hopes about making utopian market and democratic freedom that were to be spread throughout the Middle East as an outcome of this war. Justifying the need of a war in the wake of the terrorist attacks on the Pentagon and World trade Center in September 2001, President Bush made an address scripting Iraq geopolitically as part of an "axis of evil" alongside Iran and North Korea (Bush, 2002). Spark outlined how the theorization of groundless construction of fear and hope were employed to justify the war which resulted in geographies of dispossession for those in the war zone.

Evaluating the geopolitics of fear in post-tsunami Sri Lanka, Hyndman (2007) highlighted the political effects of the government's response in the context of long-term conflicts between Muslim and Tamil communities. It explored the ways in which fears and hopes have been intensified or mobilized through the redistribution of territory and international aid in the aftermath of disaster.

Radcliffe (2007) identified the geopolitics of fear as dangerous and destabilizing threats to Latin American states and to regional security. She traced the representation of indigenous people as "threatening others" to the actions of weak, racialized states, to the contemporary neoliberal reworking of economic and political life, to struggle over resources and related projects of cultural transformation.

Klinkenberg (2007) pointed out that geospatial technologies and analyses, as they are currently employed by new "security" organizations and bureaucratic institutions, allow the values of the most powerful members of the society to construct "fearful others" and then to monitor, regulate, and control their movement through space. However, a proper analysis can also be useful for responding to issues of environmental and social justice, for understanding patterns of health and illness, deforestation, urban sprawl and pollution. Klinkenberg outlined fear and hope that can interrogate the contradictory effects of these technologies and practices as well as the ways in which they play out unevenly across places and for social groups marked by the difference. Using the case of the Los Angeles River, Wollch (2007) connected political, social and cultural processes with nature-society and ecological concerns. She anticipated that the success of ongoing collaborative projects based on socio-ecological planning may lead to more sustainable and more hopeful urban futures.

These analyses reveal both the material bases for fear and also the ways in which fear and hope are manipulated politically. It also materializes our consciousness to move all us beyond fear and toward a hopeful and a utopian future. The more and more analyses/ understandings of spatio-political-ecological processes producing fear may lead us to the direction of a hopeful, safe and democratic future.

3. DISPARITY AND COMPLEXITY OF THE NEPALESE SOCIETIES: GROUNDS FOR FEAR AND HOPE

Although Nepal is a small country with just an area of 147,181 sq. km. and a total population of 23 million (CBS, 2001), yet, it poses myriad of diversities in physical, socio-economic-cultural, and biotical realm leading to different space-making processes with different bases. It poses three ecological zones: *the Himalayas* (mountains) in the north, *the tarai* (plain) in the south, and *the hills* in the middle. The hill and mountain together cover almost three-fourths of the country's surface whereas the *tarai* is the northern extension of India's *Gangetic* plain. Altitude varies from 67m of the southern plain to 8848m (Mt. Everest) the highest point in the world above the sea level. The country experiences sub-tropical, warm temperate, cool temperate, alpine and tundra types of climates with the increase in elevation. The extreme altitudinal gradient has resulted in several bio-climatic zones within a short span (193 Km in average) characterizing variations in bio-diversity and human-resource interaction.

Administratively, Nepal is divided into 75 districts with 16 districts in the mountain, 39 in the hill and 20 districts in the *tarai* region. The districts are further divided into 3,915 village development committees (VDCs) and 58 official urban areas (municipalities). According to census (2001), 48.5 per cent of the populations live in the plain area, 44.2 per cent in the hills and 7.3 per cent in the mountain areas. Population distribution was dense in the *tarai*, medium in the hills (except valley districts), and sparse in the mountains. Nepal's 58 urban areas lie in only forty three districts covering just 17 per cent of the total population in which the shares of plain, hill and mountain are 52 per cent, 29 per cent and 19 per cent respectively. Therefore, the urban areas appear inadequate for connecting vast rural areas spatially, economically and socially for development process as *trickling down* from the core (urban areas) to the hinterland regions.

Nepal ranks 138th out of 177 countries in the Human Development Index, 2010 with 62.1 years of life expectancy at birth and 54.1 per cent literacy rate (UNDP, 2010). Even within the country also, urban areas in general have higher HDI than rural areas because of better access to health care, education and income opportunities. District level disparities are significant; particularly for mountain and hill districts of far and mid-western regions which are worst in terms of HDI. The distinctive feature of Nepalese phenomena is the widespread disparity of each of the positive indicator from areas of south to north as well as from east to west. The conditions of basic services and economy are no exception.

3. 1. Disparity in access to services

The present paper aims to evaluate access to services such as road, education, health, safe drinking water, non-farm activities and manufacturing establishments.

Access to services in ecological regions

Table 1

No.	Service	Mountain	Hill	Tarai	Nepal
1	Road Length, per cent	1.8	49.7	48.5	
2	School Enrolment, per cent	99.4	98.1	66	82.7
3	Health Services, Population per facility	2,972	4,801	7,786	5,588
4	Household with safe water	64.4	73.4	88.8	79.8
5	Non-farm Activity Population, per cent	21.5	34	50.8	40.3
6	Number of Industries, per cent	1.9	49.7	48.5	3,557
7	Person Employed in Industry, per cent	0.14	2.32	1.81	1.89

Source: Central Bureau of Statistics, 2002

The comparison is limited at the level of ecological regions of mountain, hill and *tarai* plain (table 1). However, the analysis at district level may result in much wider disparities.

Road accessibility has a significant effect on movement of goods and range of economic activities. In Nepal the general observation is that higher the density of roads, the higher is the level of development of the area. Of the total road length of the country, the hill and *tarai* area cover most with a negligible 1.8 percent in mountain zone. The figures of school enrolment of children aged 6 to 15 years seems to be encouraging, and shows a reverse trend of decrease from north to south. On average, available health facilities in the country serve 5,588 persons. Only *tarai* area exceeds the national average, and it is sparse in rural areas of hill and mountain zones.

Almost 80 percent of households in Nepal have access to safe drinking water, and the percent increases from the mountain to *tarai* plain. The proportion of population engaged in non-farm activities indicates a higher level of development. The figure follows the same general trend of progressively lower at higher elevations. In manufacturing establishments, hill and *tarai* areas share most as the similar trend of the road access in the country. The slight edge (49.7 per cent) of the hills over *tarai* is due to the concentration of industries in Kathmandu valley.

3. 2. Disparity in economy

A wider disparity in economic activities is the distinct characteristic of Nepalese societies. A little over 42 per cent of the working populations (aged 10 years and above) were economically active; mostly (two-thirds) engaged in agriculture and other primary sector activities (CBS, 2001). Remittances from migrant workers, particularly those overseas, have emerged as the major contributor to the economy of the country. Nepal had a Gross Domestic Per capita income of $468 in 2009 and 31 per cent of the population below the poverty line (MoF, 2010).

As an agricultural country where majority of population depend on farming, cultivated land is the prime resource of the country. The evaluation of the indicators such as area under cultivation, the population involved in agricultural activities and the productivity of the areas would help understand the complexity of primary sector activities. Japan Forest Technology Association (JAFTA), 2001 has estimated 27.6 percent of the total area of the country as agricultural land. The percent for mountain, hill and *tarai* ecological zones was 10.0, 27.2, and 55.2 respectively. Cultivated land per person was 0.175 hectare for the country as a whole. Among ecological regions, the hill has the lowest per-capita land (0.163 ha) followed by *tarai* (0.163) and mountain (0.307). Although the difference is higher among the mountain and plain areas, the quality of land may not be comparable with that of *tarai* plain. In general, the trend of the proportions of population in agricultural activities is decreasing from north to south.

Of all the major cereal crops produced in the country, paddy has the largest share in area coverage as well as in production and yield per hectare. The figures of yield for total cereal crops and cash crops are 1.709 and 1.700 in mountain, 1.866 and 1.410 in hill and 2.613 and 7.553 metric ton per hectare in *tarai* plain. The evaluation of food sufficiency shows comparatively a better position in plain, a fair position in central hill and very poor position in western mountain districts.

3. 3. Complexities with changing political systems

The changes that took place in political forefront of the Nepalese history have deep- rooted facets of socio-cultural-religious arena of the societies. During the last 240 years since late king *Prithivi Narayan Shah* annexed several smaller kingdoms into a greater Nepal, it has witnessed a despotic rule of monarchy, autocratic rule of *Ranarchy*, rule of parliamentary democracy with constitutional monarchy and a republican democracy.

The 1951 revolution overthrew the autocratic Rana rule, and introduced democracy in Nepal but it lasted only for a decade. However, it greatly aroused political and cultural awareness among the citizens of Nepal. The one-party *Pachayat system* was the basic philosophy implemented in the country for almost thirty years. The restoration of democracy by the revolution in 1990 (*Janaandolan)* ensured civil liberty and political rights. The people's movement, 2006 resulted in the new Interim Constitution of Nepal 2007 which has recognized the country as a *multiethnic*, *multilingual*, *multireligious* and *multicultural* nation. The constitution has also declared Nepali as official language and all the other languages spoken in Nepal as the national languages of the country. It has altered the so-called caste hierarchy that was set forth by the *Muluki Ain* (Law of Land) of 1854 and the concept of homogenization through one language, one costume, and one country (*ek bhasa, ek bhesh, ek desh*) by the *Panchayati system*.

Janga Bahadur Rana (initiator of Rana rule in the country) in 1854, aimed at codification of populace into caste hierarchy of *high castes* (*Brahmin, Chhetri, Thakuri* and *Sanyasi*), *Matwali* (alcohol drinker, particularly *Kiranti* and *Mongols*) and *Sano Jat* (*Kami, Damai, Sarki, Gaine* and others) today known as *Dalits* (Bista, 1991). The diversities also occur in the racial-religious-linguistic facets; the same racial group observes different religions and speaks different languages and vice versa. People of Nepal could be differentiated based on three major racial and cultural divisions such as Indo~Aryan, Mongoloid (Tibeto~Burman), and Austro~Asiatic branch (Baral, 2008). The so-called high castes such as Brahmin, Chhetri, Thakuri and Sanyasi together with Dalits from hills and tarai are included in the Indo~Aryan category, whereas Mongoloid includes Magar, Gurung, Newar, Rai, Limbu, Tamang, Bhote, Sherpa, Thakali etc. Similarly, Satar, Jhangad, Mushahar, Batar, Rajbanshi etc. are known as Austro~Asiatic group. Although the castes and ethnic groups of Nepal have diverse origins, rituals, traditions, and cultural practices, yet, the Hindus and the other cultural groups have co-existed for centuries.

The national census, 2001 has identified 100 castes and ethnic groups, 92 languages and dialects and nine religious groups. Out of the total population of Nepal, 80.6 per cent are Hindus, 10.7 per cent are Buddhists, 4.2 per cent are Muslims, 3.6 per cent are Kirantis and the rest are "others". In the Nepali societies, language is often used as a symbolic badge connected to distinct caste groups, despite several exceptions. The following distinctions could be made on the characterization of language spoken by the people (Turin, 2004 as cited in Sinha, 2008).

Single-to-many: Rai at the basic level is a single constituent member, but each sept speaks a range of at least 15 mutually unintelligible languages from each other such as Bantawa, Puma, Chamling, Chulung, Thulung, Kulung, Sampang, Dumi and Athpahariya etc.

One-to one: Magar, Tamang, Gurung, Limbu, Sherpa, Rajbanshi, Kumal, Majhi, Danuwar, Chepang, Thami, Thakali, Bhote, Dhimal, Lepcha, Byansi, Raute, and Raji each has a language of their own irrespective of their septs.

Many-to-single: Newar, Chhetri, Brahmin, Kami, Damai etc. shares a single language.

All-to-one: Nepali by all the member of the Nepali speech community.

The Maoist launched an armed revolution with slogans of new democracy, ethnic autonomy and equality among the various strata of society, which flourished ethnic activism in the country. The Nepal Federation of Indigenous Nationalities (NEFIN), an officially recognized representative organization of Nepal, has emerged as a significant player in post-2006 politics of the country with strong support for ethnic federalism and proportional representation system. The post~people's movement scenario ensured representation of the excluded groups, marginal sectors and ethnic groups of the state in Constituent Assembly (CA), Parliament and in any other recruitments made by the government. The political parties were committed to providing 37.8 percent seats to the ethnic groups in order to make inclusive CA through proportional representation system (Baral, 2008).

Therefore, apart from the diversities generated by the topographies and climates, significant complexities and disparities due to the politico~socioeconomic~cultural cum developmental processes are the apparent manifestations of the present day Nepali societies. The analysis of complexities and disparities would certainly help understand the contemporary fears generated from the different facets of the society and also it could deal with our questions, our priorities, and our values to shift our positions of hope rather than positions of fear and anxiety.

4. FEARS AND HOPES CULMINATING IN NEPALESE SOCIETIES OF POST~PEOPLE'S MOVEMENT

With solidarity among people, political parties together with the civil society, a historic people's movement, 2006 was initiated in Nepal to reinstate dissolved parliament, to hold election of constituent assembly, and introduce a full democracy. The movement was against the steps of the king of Nepal, who on the 1st February 2005 reversed the ongoing constitutional democracy and banned democratic and human right activities that were ensured by the constitution of 1990. The ground for the movement was made in India by the famous *Twelve-point Tri-Party Understanding* between *Communist Party of Nepal* (Maoist), *Nepali Congress* (NC) and *Communist Party of Nepal* (UML).

The people's movement, 2006 was launched against the backdrop of fear of insecure basic human rights, and hope for freedom and democracy, and a utopian *peaceful-prosperous-inclusive-democratic Nepal*. The movement illuminated "hope in the dark" for the people suffering from spatial disparity as well as remoteness, political inequality, economic deprivation, educational inequality, developmental deprivation and social exclusion (disadvantaged, marginalized, downtrodden, and oppressed). The *people's war of Maoist* that began from 1996 paved awareness and participation on politico-development activities for the ethnic minorities and poor people that were excluded from mainstream politics.

The *Comprehensive Peace Accord* (CPA) between the government of Nepal and Communist Party of Nepal (Maoist) held on 8 November 2006 had a commitment to transforming ceasefire into sustainable peace. It ensured confinement of the Maoist Army combatants to specified seven cantonment areas. It aimed to constitute the Interim Legislature-Parliament, Interim Constitution and the Interim Government to hold election for the CA. The whole process has intended to end the fears of the conflicts that continued for a decade in the country and grounded hopes of a Constituent Assembly that would enable multi-party democratic system of governance, civil liberties, fundamental rights, human rights, full freedom of press, and concept of rule of law, as well as democratic values and norms (The Interim Constitution of Nepal, 2007). It also anticipated hopes to accomplish the progressive restructuring of the state in order to solve the class-related, ethnic, regional and gender problems existing in the country.

As a result, the historic constitution assembly election of Nepal took place on 10 April 2008 with huge people's participation. Election for CA had two provisions: direct election for candidates of 240 constituencies by the voters and vote for the parties which could nominate their candidates (a total of 360) from the list submitted to the Election Commission based on the proportion of the turnout of votes. CPN – Maoist strongly urged for the federal state-based republican model in their election manifesto. It strongly advocated for a new constitution with inclusion of excluded communities and participation, empowerment of ethnicity, and eleven federal states, mostly ethnic based. Results of direct election showed a win of the Maoist, NC, and UML in 50, 15.4 and 13.75 per cent constituencies respectively. The Maoist party captured overwhelmingly large shares in areas of mountains and hills that are inhabited by specific ethnic

groups such as *Gurung, Magar, Rai, Tamang, Newar, Sherpa* etc., and the *tarai* plain areas dominantly inhabited by *Tharu* community. The result of the election showed the hopes and trust of the Nepali people in the Maoist party advocated vision of a prosperous *New-Nepal*. Similarly, the regional parties from *tarai* area known as *Madhesi People's Rights Forum*, *Tarai Madhes Loktantrik Party* and *Sadhvawana Party* candidates were elected from 12.5, 3.75 and 1.67 per cent constituencies. A movement in the name of empowerment of *Madhesi* people and a *Madhesi federal state* took place just prior to the CA election. The local development issues and empowerment through self-ruling state that were the major agenda of the concerned parties, convinced the people to cast their votes in favour of *tarai* parties. The election result aroused the hopes of the Nepali societies in the Maoist party and the *tarai* based regional parties.

The post~CA election paved the way for the election for new President and Vice President, and formed coalition government headed by ex- rebel leader as Prime Minister and a full republican state throwing the king into a civilian. It provided the nationalities of the country with a great sensible hope. However, in the meantime the failure of the government, unsuccessful in management of the Maoist army and even in framing a new constitution within the assigned time of two years period, developed a fear of uncertainty in the societies. The frequently occurred general strikes that took place in the country in the name of political parties, their allies, ethnic groups and others paralyzed the industrial sectors and the economy of the country.

Further, the law and order situation throughout the country is in such a critical situation that each day incidents of looting, murdering and kidnapping etc. have become main headlines of the national newspapers. Vandalism, muscle power and lawlessness have become the integral part of societies of Nepal. The situations in the *tarai* areas have become even worse than the other parts. Although the second coalition government resigned for its all-round failures, the new government has not yet been formed even after the 17th round of Prime Ministerial election in Parliament. The scandals of corruption in each of the developmental activities and decisions of the bureaucrats can be frequently read in the news papers.

Along with the emergence of a democratic Nepal, the grievances have also been expressed by the marginal, excluded, and ethnic groups against the polity of the state. It is quite common to hear or see the photographs of the militant groups from each community in the news papers. Most of the ethnic groups of the state have illegally demarcated the boundary of their so-called federal states, and even started to collect taxes/revenues forcibly. The projects related to hydro-electricity, water supply, and road construction etc. are suffering disturbances and are not complete within total project periods. The load-shedding has made regular dark nights in the country. People are anxious with fear of multiple states within a state. There is wide spread fear of revolt of Maoist party and re-emergence of the conflict in the country again.

People of present day Nepalese societies are living with sorrows of fears, and even there is a common fear of becoming Nepal a failure state of the world. The fears are further grounded due to the existing disparities and complexities of the societies, and break down of the harmony among the cultural groups that have co-existed for centuries. Nonetheless, Nepali societies are fragmented and disintegrated into minute fractions due to the differences of socio-cultural-religious-political beliefs. So are the cases among each and every components of the society including civil servants/bureaucrats, security organizations, teachers, lawyers, businessmen, industrialists, press-media, and others. The most crucial concern of the present day Nepali people and civil societies is neither they have belief in the politicians nor there is any leader on whom they could rely. So, the hopes that germinated during the CPA have dwindled into fears of insecurity and uncertainty about the future of the country.

5. CONCLUSION: A WAY AHEAD

Except for the formation of a CA and a few positive signs and signals the people's hopes and aspirations as well as most of the issues raised before the CPA have remained the same. The ground realities are disbelief and increasing differences among the major political parties regarding major agenda of the constitution to be formulated; and disbelief is further manifested in the dissatisfactions and frustrations of the native populations.

The fear of what's next after the return of the United Nations Mission is another crucial matter in Nepal. Until and unless the fragmented and disintegrated Nepalese civil-societies come forward jointly to pressurize the major political parties to lead the country in positive direction by ending this painful transitional period with a new constitution accepted by all, a serious threat will cloud over the sky of Nepal. Based on the existing situations prevailing in all the corners of the Nepalese society, it would not be an exaggeration to claim that the present Nepal is in serious crisis.

The geopolitical situation of Nepal as well as the nature of political polarization of the neighbouring countries and the world after the cold war, necessarily, dictates the politicians of Nepal to get rid of the existing situation as early as possible. The fears and hopes that appeared in Nepalese societies prior to people's movement further aggravated into numerous forms and complexities. The fear of the day in Nepal is for its non-existence as an independent, indivisible, sovereign, secular, inclusive and fully democratic Nepal as envisaged by the Interim Constitution of Nepal, 2007.

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JOB-EXCHANGE FOR ROMANIA'S GRADUATES – SPATIAL DISTINCTIONS BETWEEN JOB SUPPLY AND DEMAND, 2010

IRENA MOCANU[1]

ABSTRACT. – Job-exchange for Romania's Graduates – Spatial Distinctions between Job Supply and Demand, 2010. The economic-financial crisis has reduced the job supply and increased unemployment. It would be expected that job-exchanges for young graduates (the organised framework to meet the specific supply and demand of this labour force segment) become more important and better results are being obtained from one year to the next. The aim of the present paper is to point out territorial distinctions between counties and the organising agencies in 2010 and outline the outcomes. The available data-base represents a synthesis of the characteristic quantitative and structural features distinguishing job-exchange agencies for graduates from the other types of agency engaged in this activity, published by the National Agency for Employment. Our analyses and assessments are based on the cartographic representations of those indicators suggestive for the subject under study. The results have revealed a direct dependence between the effective participation of economic agents and the quality and quantity of the offer made by each of them; the economic agents effectively participating in job-exchange events was under 57% in all the agencies studied; in terms of each agent's offer, it is county agencies that head the table, local agencies and working points occupying the last places in the national hierarchy; nineteen county agencies had cumulated 75% of the total number of job demands, while local ones and working points registered a mere 13%. Since demand was in excess of offer in almost all job-exchange agencies, only 12.1% of the applicants actually got a work-place. The quantitative assessment of the extent to which job-exchanges contributed to the employment of graduates (by calculating the number of job-findings per participants), the year 2010 proved better than 2009, but less so if compared to other types of job-exchange agencies. Qualitative assessments (by type of school graduated by the applicants) indicate that high-school, post-high-school, vocational and apprentices-school leavers benefited the most, they representing 74% of all the graduates employed in 2010.

Keywords**:** *job-exchange, job demand, job supply, territorial distinctions, Romania***.**

1. INTRODUCTION

The current economic-financial crisis has sharply reduced the chances for graduates to find a job (the proportion of those employed out of the total graduates listed by the County Agencies for Employment dropped from 29.8% in 2008 to 15.5% in 2009). At the same time, between 2008 and 2009, unemployment among this category rose by some 90,800 graduates in entire country. Therefore, job-exchanges for graduates, likewise similar events for other categories of jobless people (youth, Rroma, etc.) represent an important labour supply-and-demand framework.

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In September 2010, job-exchanges for graduates were being held in 86 localities; most of these exchanges were organised by county and local Agencies for Employment rather than by profile working points. The counties involved were Hunedoara (12), Suceava, Buzău and Vrancea (4 each), Brăila, Vaslui, Neamț, Teleorman, Prahova and Harghita (3 each), and 1-2 job-exchanges in the other counties. Only a number of 80 agencies out of the 86 studied had discharged a concrete activity and registered positive results, the others did not benefit by the participation of any economic agent, although about 25-30 had been contacted.

2. JOB SUPPLY

In 2010, the job-exchange supply for graduates was by 15.2% higher than in 2009, a number of 1,993 participant economic agents had 3,207 work-places available for applicants. Potential employers (35 – 117 agents) were contacted by County Agencies for Employment, with the exception of those counties where, beside county agencies, two, three or more local agencies and working points were in place (Hunedoara, Suceava, Mureş, Harghita, Argeş, Prahova, Buzău and Teleorman). The city of Bucharest was heading the table with 10,500 contacts. Job supply depends largely on the proportion of economic agents per contacted agents who actually participated in the job-exchange set up in each county. Percentages were under 57, highest participation (39%-57%) registered Iaşi, Vaslui, Sibiu and Argeş; 28%-38% Suceava and Bihor, a group of counties from the south-west of Romania (Gorj, Dolj, Olt), Dâmbovița and Constanța. In the other 31 counties few and very few contacts attended, so that the supply itself was reduced (30%-10% and under 10%, respectively, down to a minimum of 0.4% in Ilfov County).

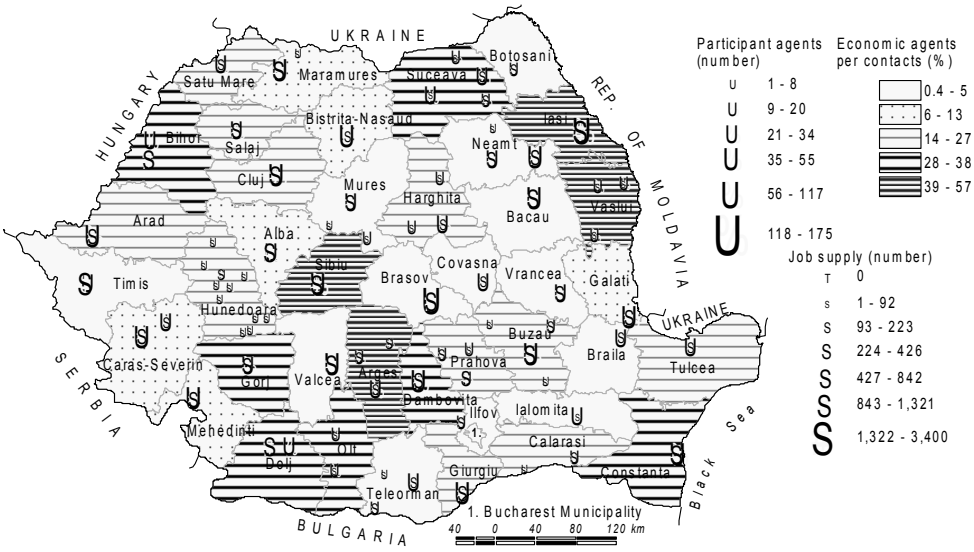

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Fig. 1. Participant economic agents and their supply. Job-exchange for graduates, September, 24, 2010 .

All participant agents offered work-places, significant territorial distinctions depending on the number of economic agents present in the event, so that the more numerous they were, the greater the offer. However, there were situations when, despite an above-average number of agents (25 agents/agency), the offer was fairly low (274 jobs/agency), e.g. in the counties of Bistrița-Năsăud, Ialomița, Vaslui, Suceava, Harghita and Mureș.

The distribution of available jobs depended not only on the number of participant agents, but also on the number of work-places they offered. The ratio between job supply and number of attending agents shows that county agencies headed the table (Timişoara, Oradea, Bucureşti, Alba Iulia and Deva), second in line coming the local agencies (Roşiorii de Vede and Buftea); some county agencies (Arad, Satu Mare, Drobeta-Turnu Severin, Suceava and Galați), local agencies (Petroşani, Pogoanele, etc.) and working points (Brad, Călan, Petrila, Hațeg and Ilia – Hunedoara County) fell to the bottom of the hierarchy.

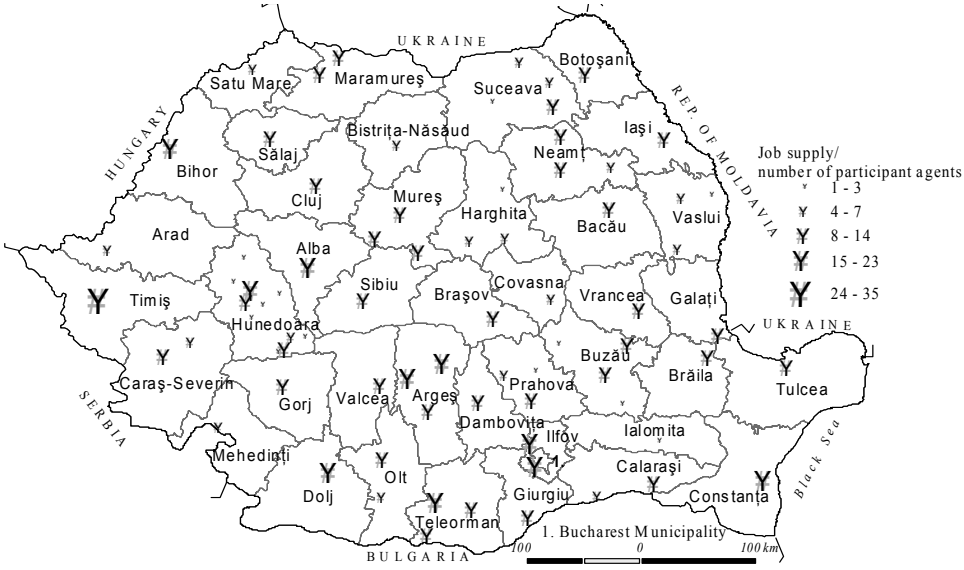

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Fig. 2. Job supply/number of participant agents. Job-exchange for graduates, September, 24, 2010.

3. JOB DEMAND

In 2010, there were 33,708 employment seekers, that is by 3.9% fewer than in the previous year, more applications having been registered in Romania's counties situated in the north-east and north (Iaşi–2,804 and Suceava–1,167), east (Vaslui and Bacău), west and centre (Timiş–1,936, Bihor–1,620, Cluj–1,800 and Braşov–1,122), south and south-east (Bucharest–3,000, Prahova–1,265 and Vâlcea–1,200, Dolj, Argeş and Teleorman).

As far as organising agencies are concerned, demand depended largely on the territorial position of the respective agency within the National Agency for Employment system. More than 1,000 applications registered each of the following county-seat agencies: Iaşi, Timişoara, Cluj-Napoca, Oradea, Râmnicu Vâlcea, Braşov, and the city of Bucharest;

between 999 and 250 had the vast majority of the other county-seat agencies, with the exception of Deva and Călăraşi (only 51 and 76 applications, respectively); local agencies and working points received 4,441 applications.

In the major university centres, actual labour-market suppliers, the proportion of graduates who applied for a job was of 77.2% (2,900 in Bucharest, 1,850 in Iaşi, 1,440 in Cluj-Napoca and 1,279 in Timişoara). Numerical disparities in the territory are due on the one hand, to the negative effects of the current crisis on the regional and local economies, and on the others, to the large number of students enrolled in the higher education system in particular, a situation that has significantly reduced the chances of young graduates to find a job.

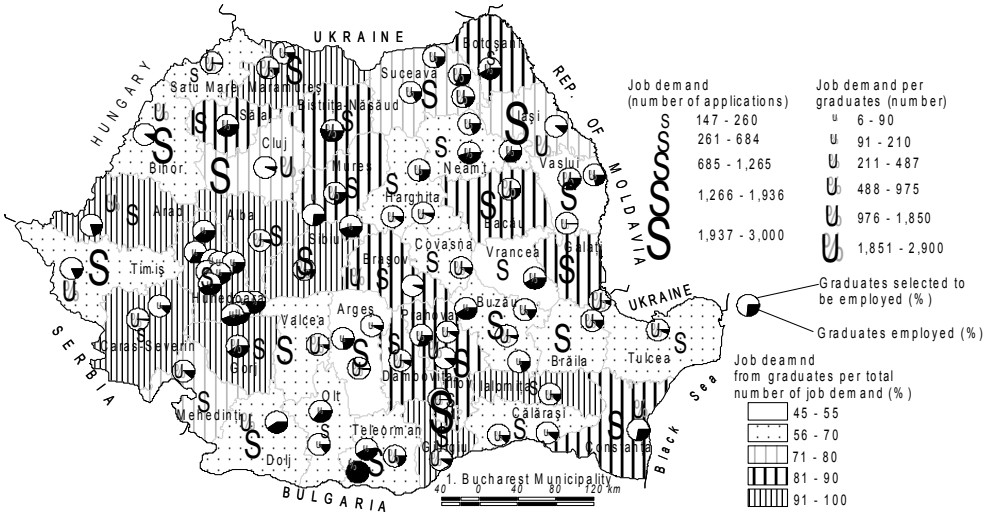

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Fig. 3. Job demand. Job-exchange for graduates, September, 24, 2010.

The flows of graduates originate from Bucharest and the other three big university centres (Cluj-Napoca, Iaşi and Timişoara), as well as from regional centres (Craiova, Constanţa, Oradea, Braşov, Sibiu and Galaţi) set up within distinct historical regions, or in areas of regional interferences (*Research aimed at the involvement of Romanian universities in urban restructuring and regional development, http://www.cicadit.ro/ro/projects_n2_2_1.html*). In some areas at least, the latter category of graduates outnumbered market demand.

4. JOB SUPPLY/DEMAND RATIO

In 2010, there were 4,599 (26.7%) fewer applications than in 2009. However, in the majority of counties and more especially in Timiş, Bihor, Cluj, Iaşi and Prahova, the supply was by far lower than the demand, the same situation in other counties situated in the north and east (Suceava, Vaslui and Galaţi), south and south-west of Romania (Teleorman, Vâlcea and Dolj). In twenty-six counties disparities between these two variables were the lowest. In five counties the job supply topped demand, positive maxima (Bucharest) standing at only one-third of the negative record of Iaşi and Cluj counties.

The job supply-to-demand ratio registered by county agencies, local agencies and working points varied from +400 (Bucharest) to -1,150 applications (Cluj-Napoca). A number of ten agencies had more jobs to offer than demanded for (especially those in Bucharest City, Alba Iulia, Deva and Zalău, at the other being Petroşani, Roman, Călăraşi, Buftea, Hunedoara and Târgu Jiu). In the other county and local agencies, as well as working points, offer did not meet demand, between -4 applications (Călan, Hunedoara County) and 1,150 applications.

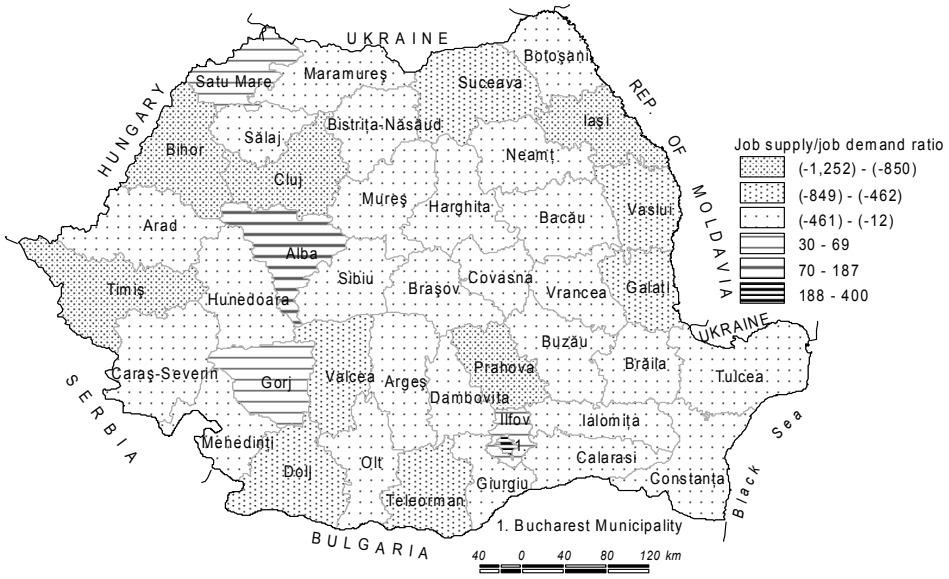

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Fig. 4. Supply and demand. Job-exchange for graduates, September, 24, 2010.

5. RESULTS

The results obtained at job meetings for graduates were assessed in terms of quantity, by calculating the proportion of graduates employed out of the overall applicant graduates, the former category representing 12.1% across the country.

In 2010, the situation appeared to be far better than in 2009 (1.8%), since 5.1% of the job-seekers could be employed through all types of job-exchange profiles (job-exchanges were instituted under Law 76, art. 59 and Law 116, art. 5, http://www.anofm.ro/mediereamuncii-actualizat-la-28-03-2011). However, in the case of job-exchange for graduates, the year 2010 was among the poorest compared to the other types of exchange (general job-exchange: positive solutions for 17% of the applications received; job-exchange for crafts and other branches: 17%; job-exchange for disadvantaged target-groups: 12%, etc.) (Source: processed statistical data, *Sinteză privind stadiul realizării Programului de ocupare a forţei de muncă al ANOFM, pentru anul 2010*).

The employment of graduates varied widely (0% - 78%) compared to the national mean (12.1%); only 27 job-exchange organising agencies held a better record (Piatra Neamţ – 78%, Nehoiu, Buzău County – 63%, Haţeg, Hunedoara County – 53%, Târgu Jiu – 49%,

Bucharest Municipality – 20%, Timişoara – 19% etc.), 49 units standing below average, among which some agencies located in major university centres, e.g. Cluj Napoca – 3%, Iaşi – 10%. None of the 150 job-seekers from Buftea (Ilfov County) and 100 from Bârlad (Vaslui County) got a work-place through the respective agencies.

In terms of absolute values, outstanding employment results had the county agencies located in big university centres, such as Bucharest (572 graduates), Constanţa (287 graduates), Timişoara (238 graduates), Craiova (216 graduates) and Iaşi (184 graduates).

From among a total of 3,152 graduates employed, 16% held a B.A. degree, 41% had attended high-schools and post-high-schools, 33% vocational and apprentice schools, 8% primary and secondary schools and 2% represented other categories of graduates.

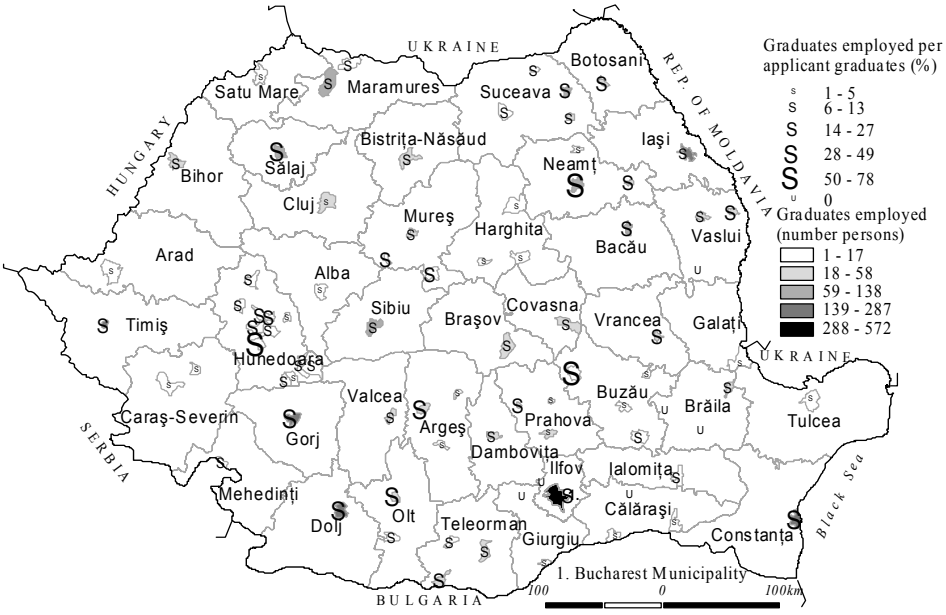

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Fig. 5. Job-exchange for graduates September, 24, 2010. Results.

The quality of job-exchange was assessed by analysing the structure of the employed applicants in terms of instruction grade, the findings confirming the usefulness of the exchange system for various categories of graduates. Thus, county agencies provided jobs mainly for high-school, post-high-school, vocational and apprentices school leavers. In the majority of cases, B.A. graduates found a work-place in Bucharest (100) and in the counties of Constanţa and Timiş (55 graduates and 44, respectively), the proportion of this category being significant in Covasna (57%), Botoşani (53%), Caraş-Severin (50%) and Dâmboviţa (46%) counties. Pretty high percentages (10%-25% up to 60% even) of primary and secondary-school applicants were registered in the south-east and south-west of Romania (Bucharest and Dolj – 10%, Constanţa – 16% and Olt – 60%), as well as in the central part of the country (Hunedoara – 24.4%, Sibiu – 16.5%, Mureş – 31.7% and Cluj – 36.8%).

In terms of instruction grade, the structure of graduates employed through the local job-exchange agencies is very similar to the county one. Most work-places went to high-school, post-high-school, vocational and apprentices school graduates in Bucharest (399 i.e. 70 % out of those who had filed an application), Constanța (186, 65%), Craiova (172, 80%), Timișoara (161, 68%), Iaşi (145, 79%), Târgu Jiu (132, 79%), Piatra Neamț (113, 82%) and Bacău (112, 97%). The agencies and working points that numbered few and very few applicants from these categories (30 – 11) and 10 – 1, respectively had a one-hundred percent employment rate (Râmnicu Vâlcea, Arad, Curtea de Argeş, Lupeni, Petroşani, Vulcan, Orăştie, Simeria, Oltenița, Călăraşi, Huşi, etc.).

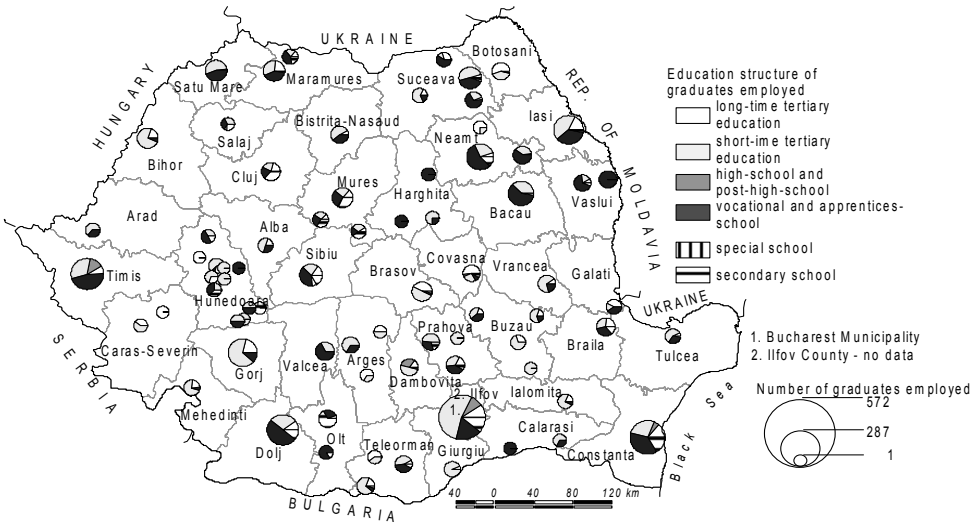

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Fig. 6. Education structure of graduates employed through the job-exchange of September 24, 2010.

The territorial distribution of higher education graduates shows them to have been employed mainly in the university centres of Bucharest, Iaşi, Timişoara, Craiova, Constanța, etc. Only 2.8 local agencies and working points offered employment to primary and secondary-school graduates: 59 in Bucharest and one in each of the following towns: Turnu-Măgurele, Vaslui, Paşcani, Brad, Hunedoara and Caracal.

6. CONCLUSIONS

As a consequence of the economic-financial crisis, the job-exchange supply for graduates had sharply diminished in 2010 (by 47.6%) compared to 2008, while demand increased by 8.7% within the same time-interval. There were by 32.9% fewer economic agents participating in these exchanges, as the crisis had reduced economic activities. In 2008, supply topped demand, the situation deteriorating until 2010, when these two variables became somewhat better balanced.

The territorial supply depended on the effective participation of economic agents in job-exchanges and the vacancies each of them had available. The proportion of participant agents was below 57%, things looking more promising in the south-west and north-east counties. The ratio between job supply and the number of economic agents present in the job-exchange events shows that the localities hosting mainly county agencies on their territory head the table, while local agencies and working points lie at the bottom of the hierarchy.

Nearly 75% of the job applications were filed by participants from 19 counties, each county having received over 1,000 applications, while Bucharest alone registered a maximum of three thousand. Local agencies and working points gathered only 13%; what mattered in this case was largely the local organisational framework created for offer and demand to meet. The uneven spread of demand in the territory is the consequence of both the negative effects of the current crisis on the regional and local economies, in that it drastically reduced employment opportunities for young graduates, and the excessive offer of the educational system, of the tertiary one, in particular.

With the exception of five counties (Satu Mare, Alba, Gorj, Ilfov and Bucharest Municipality), which offered more jobs than demanded for, the overwhelming majority of the others had a much lower offer. It was only ten local agencies and working points that could provide more employment than registered, in the other cases the situation was reversed (between 4 and 1,150 applications). The quantity and quality of job-exchange results has been estimated by calculating the extent of employment obtained by participants in these events and their instruction grades, respectively. In terms of quantity, the year 2010 showed better results than 2009, however, referred to what other types of job-exchange had achieved, graduates exchange events had some of the poorest records. With regard to quality, it seems that job-exchanges proved more effective for high-school, post-high-school, vocational and apprentices-school levers, these categories representing 74% of all the graduates offered employment.

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CULTURAL LANDSCAPE ELEMENTS IN BAIA DE CRIS AREA (APUSENI MOUNTAINS)

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ABSTRACT. – Cultural Landscape Elements in Baia de Criş Area (Apuseni Mountains). The article highlights the types of constituent elements of Baia de Criş area cultural landscape (located in Brad - Hălmagiu Depression), occurred as a result of the constant changes of the past, induced by the interaction of natural and human local factors. Natural elements such as: depression and high hills, a moderate temperate continental sub-mountainous climate, rich soil and subsoil resources have been a favorable framework for rural community development in the area.

Keywords: *Baia de Criş, rural cultural landscape, elements of cultural landscape, history, traditional.*

1. INTRODUCTION

Acceptance and use of the meaning (definition) given to cultural landscape by European Landscape Convention, ("*an area as perceived by people, whose character is the result of the action and interaction of natural and / or human factors*" - The European Landscape Convention, 2000) means the perception of the natural (physical), as the attribute of landscape, setting the deployment of human action, every activity inducing anthropogenic changes.

Natural (physical) characteristics of the place (local climate, soil, water resources, mineral resources, etc.) are attributes of the landscape framework for the setting of human action. All human activities induce changes and the visible imprint of human intervention is represented by the cultural landscape (Fellman, J. et all, 1990).

To understand spatial relationships, physical and cultural interactions and in general to understand the complexity of the development of cultural landscapes, their features must be seen as the result of the constant natural and anthropogenic changes of the past.

In this aspect, identification, analysis and classification of cultural landscapes are useful and necessary to highlight the uniqueness of the landscape elements and cultural and regional differences, in cultural landscape planning (in order to establish measures for the protection and preservation).

2. METHODOLOGICAL APPROACH

Achieving this article constituted a "*complex process consisting of interrelated steps, each having a specific function*" (Muntele, I. 2008, p. 15): preparatory phase (the accumulation of information), analysis phase (data storage and processing of data obtained in the first stage) and deliberative phase (for highlighting the cultural landscape elements, development of

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theoretical findings and drafting the text). The choice of methods outlined below was part of the first stage of the research (the accumulation of information) and they have been used (individually or in combination) during the entire research process.

The method of cultural landscape components registry was chosen and used as a cultural landscape specific research method. By employing it, in this case (the systematic recording of the elements into hierarchically structured records) conclusive data were obtained. Data obtained became the basis for analyzing the structure and functionally classification, of Baia de Criş area cultural landscape elements.

"*The Register of cultural landscape elements is a collection of typical cultural landscape elements and forms of land use types*" (Glink C., Has-Heinrich Meyer, Schottke Maja, 2007, p. 10) in a given space. The Register also aims to "*facilitate the mapping and evaluation of specific regional characteristics in order to better compare them and not least for an easy determination of the types of cultural landscapes*" (Glink C., Has-Heinrich Meyer, Schottke Maja, 2007, p. 10).

The use of analysis facilitated the understanding of objects, processes and phenomena in geographical landscape by their decomposition and in-depth study of the quantitative and qualitative characteristics.

3. ADMINISTRATIVE LOCATION AND GEOGRAPHICAL POSITION OF BAIA DE CRIS AREA

By its geographical position, Baia de Criş area (located in Brad - Hălmagiu Depression of Apuseni Mountains), has been a favorable framework for rural communities development, due to natural elements such as: depression and high hills, the moderately temperate, sub-mountainous climate and rich resources offered by the soil and underground (coal, gold ores).

Also, from the administrative point of view, Baia de Criş administrative unit includes ten villages (Baia de Criş, Baldovin, Caraci, Cărăstău, Lunca, Rişca, Rişculiţa, Ţebea, Valea Mare de Criş, Văleni), located on an area of 8972 hectares. Most of them consist of by forests and agricultural land.

As a result of the constant changes of the past, the area studied reveals a type of rural landscape, in which historical cultural elements, though dominant, are intertwined harmoniously with those of today. On this countryside developed traditional agricultural activities (animal husbandry, crop cultivation, beekeeping, forestry, gathering berries and medicinal plants,), industrial activities (mining, calcite processing, wood processing etc.), infrastructure (roads, railways, electricity and water supply and telecommunications) and tourism.

Investments in the area had a small impact on the countryside, although the agricultural and industrial (mining) components remained dominant in the landscape, making it multifunctional. The built area has witnessed a separate development in time, specific for mountain areas with small agricultural plots. Today, villages, whether located along Crişul Alb River floodplain, on its terraces or slopes, are surrounded by agricultural and forestry landscapes (crop areas, pastures and meadows). Village types vary from gathered ones, located along Crişul Alb River, to scattered ones, in the high area, mainly composed of hamlets and isolated houses.

4. CULTURAL LANDSCAPE ELEMENTS CLASIFICATION

Cultural landscape in this area is highlighted by the housing and household elements, those with religious significance, those related to agriculture, forestry and industry, those concerning transport and tourism, recreational and cultural elements, which contribute in a special way to emphasize the specificity of this area.

4. 1. Elements related to housing and household

Areas occupied by housing and household elements generally show an old traditional buildings landscape, among which there are a few recent constructions (villas).

It exists a number of 1669 households (www.ghidulprimariilor.ro), most of it consisting of three large buildings on three sides: the house, in front of it, summer house and between them, the shed (where are stored: the cart, the wooden barrels and the agricultural tools) provided with one or two stalls for cows.

Household is multi-functional, its components perform functions ranging from housing, shelter and animal feed to baked bread, etc. It is surrounded by a fence of wood, metal or concrete slabs. The access is made through the gates, usually constructed from the same materials. Specifically for the isolated houses on the slopes is that are not fenced, the only fences consist of wooden planks, which delimits the area for grazing animals (cattle, sheep, horses).

"Fountains are a manifestation of an ancient and effective practice of obtaining drinking water" (Stoica Flavia, Schreiber, W., 2008, page 17).

Characteristic of that area are the fountains with stone walls, wooden, tile or metal roof, provided with crank, chain and bucket.

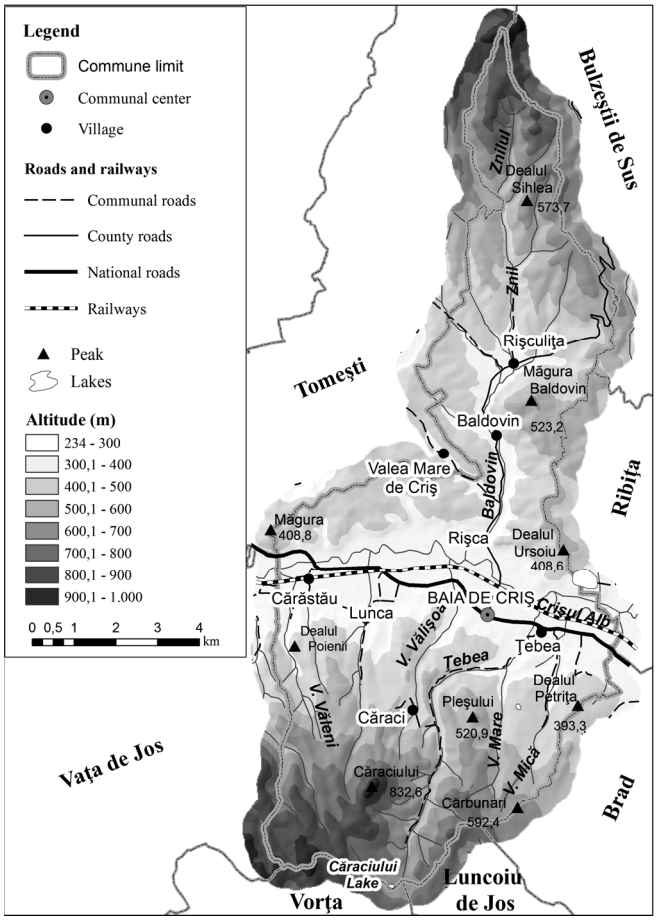

Fig. 1. Baia de Criş commune, Hunedoara county.

Along with these, traditional bread oven (built of brick and clay, with metal doors and tile), flower garden and vegetable garden (they grow vegetables for household use) near the household, complete the entire suite of traditional elements of housing and household in Baia de Criş area.

4. 2. Elements with religious significance

Churches, cemeteries, isolated graves, trinity and crosses represents elements with religious significance.

These are materialized on the area in various forms, depending on location and historical period in which they were built, architecture, financial strength of the local community, materials used and eventually on local traditions.

Fig. 2. Orthodox Church and Avram Iancu's Grave at Ţebea village.

Churches are a prominent feature of the local landscape. Exemplifying, Baia de Criș village is named *village with five churches* because there are five churches within it, belonging to different cults (one of them belonging to the Franciscan Monastery). Both, new and old churches are found in the local cultural landscape. They are reflections of local vision on art and faith.

Old wooden churches are a precious witness of religion, tradition and past local church architecture. In support of this statement are two Orthodox churches: the Wooden Church from Caraci village (dating from XVI century), Old Wooden Church from Lunca village, built up in 1710 in Mesteacăn village, moved to the Ţebea village and bought, in 1820, by parishioners from Lunca village (Jianu, N., Lapteş, M., 2004), - at the time selling - buying wooden churches was a pretty common practice in the Transylvanian villages.

Usually, the cemetery is located near the church (fenced or not). On its surface there are both old wooden crosses and new ones, carved in stone or marble. In the villages, one rarely sees isolated graves, crosses or trinity.

Stone crosses, as an evidence of Christian faith have sometimes another meaning than that given to that from the cemeteries. When stone crosses are placed on cultivated land, pasture and meadow areas they are meant to protect agricultural products and livestock from disease and predators.

4. 3. Elements related to agriculture

Agricultural elements belonging to cultural landscape, such as fields, pastures, meadows, orchards, haystack etc. are visible especially on land outside the built area. They belong to three types of surfaces: the arable land (very low in mountain area), occupied by pastures and meadows and the orchards.

Hayfields and pastures occupy the land at higher altitudes, on which are distinguished, especially in autumn and winter, many haystacks (for feeding animals in winter), sometimes solitary trees, visible from afar, and fountains for cattle watering.

Orchards in this area include fruit trees such as: plum tree (*Prunus domestica*), apple (*Malus domestica*), pear tree (*Pyrus communis*), walnut (*Juglans regia*) and cherry (*Prunus avium*).They are strongly developed in the area (due to favorable environmental conditions), especially far away from built areas, mostly on hills with southern exposure, replacing grassland or uncultivated land.

4. 4. Elements related to forestry and industry

As regards elements related to forestry and industry in particular the following stand out: meadows, forests, bushes, solitary trees, water mill, distillery, factory wood processing, mines, etc.

The forest landscape is dominated by deciduous forests, including beech (*Fagus silvatica*), oak (*Quercus robur*), hornbeam (*Carpinus betulus*), oak (*Quercus petraea*), etc., A discordant note is the specific Crişul Alb river floodplain vegetation, as poplars (*Populus*) and various types of willow (*Salix*). Regarding the areas occupied by forest, the most important traditional way of forest exploitation is by wood exploitation and processing (in sawmill). Wood is used mainly to obtain timber and as firewood.

Exploitation of mineral resources (gold and coal) has caused the appearance of cultural elements related to mining, such as Caraci Mine (Caraci village) and Ţebea Mine (Ţebea village).

However, along Ţebea River one may notice a traditional watermill for grain. Although the installation was efficient and frequent grinding of cereals took place in the past, today is no longer functional.

Distillery is used by locals to obtain alcohol from various types of fruit and consists of a copper boiler (partially inserted into a furnace of brick and clay) and a cooler with a pipeline inside, where alcohol is obtained. It is a cultural element that is found in each of the villages, as a result of the numerous orchards developed, due to the favorable soil and climate.

4. 5. Elements related to infrastructure

In correlation with the elements of housing, household, agriculture, industry and forestry, in the cultural landscape of Baia de Criş area, various types of transport elements are highlighted. Road transport routes are observable in the landscape in various forms, from simple path, to the asphalt road along with related works of art (wood and stone bridges or concrete and metal bridges).

The main access road (DN 76) form the main line linking the villages, each village having access to it through secondary roads such as: D J 762 Baia de Criş – Bulzeştii de Sus, DJ 706 Baia de Criş - Ţebea – Vorţa and DC 5 Rişculiţa – Tomeşti.

Fig. 3. Horea's Oak at Ţebea.

The only railroad which crosses the area is the one which connects two major cities (Arad and Brad) and along it, all buildings necessary for its operations (railway station, barrier etc.) are easily visible in the local landscape.

Special transport related elements are visible in the local cultural landscape in the form of metal poles for high voltage, low voltage (concrete or wood) and in the form of electricity transmission cable and telephone cables, supported by them.

4. 6. Elements of interest, recreation elements and elements related to culture

Cultural landscape is thus complemented by elements of tourism, leisure and culture, bearing the imprint of the historical significance of events during the 1848 Revolution and the personality of Avram Iancu (defender of national values). Related to these historical events that have profoundly marked the history of the Romanian people, there are many cultural elements with dual function: the commemoration of historical events and touristic. The most representative are: Avram Iancu's Grave, Iancu's Obelisk, Iancu's Cross, Three Commemoratives plaques, Avram Iancu's Museum House, Ion Simionescu's House, Stone Cross from Bouărie Forest, Horea's Oak, King Ferdinand's Oak, Traian Spring.

There are also non historic cultural elements related to tourism, frequently used for recreation, like Căraci Lake (its water was used in the past for obtaining the gold from alluvial sand) and elements related to culture (kindergarten, school, "Nerva Hodoş" Public Library and Community Center).

Cultural landscape elements classification in Baia de Criş area, (after: Schmidt Catrin, 2005, p. 10. with annotations)

Table 1

Settlement structure	Land use structure	Infrastructure
1. Elements related to housing and household	**1. Elements related to agriculture**	**1. Elements related to roads**
Traditional wooden house	Agricultural land parcel	Asphalt road
Contemporary brick house	Grassy ditch	Causeway
Summer house	Pasture	Unpaved road
Villa	Hayfield	Buss station
Sheed	Haycock	Path
Stable for cattle	Solitary tree	Wood deck
Bread oven	Orchard	Concrete and metal bridge
Cellar		
Gate and fence		
Bread oven		
Flower-garden		
2. Elements of interest, recreation elements and elements related to culture	**2. Elements related to forestry and industry**	**2. Elements related to railways**
Avram Iancu's Grave	Forest	Rail road
Avram Iancu's Obelisk	Bush	Train station
Iancu's Cross	Mine	Barrier
Avram Iancu Museum House	Distillery	
Stone Cros from Bouărie Forest	Sawmill	
Horea's Oak	Factory	
King Fredinand's Oak		
Căraci Lake		
Traian Spring		
Kindergarten, School		
Community center		
"Nerva Hodoş" Public Library		
3. Elements with religious significance	**3. Trade related elements**	**3. Elements related to special transports**
Franciscan Monastery	Village store	Electrical /telephone cable
Church	Traditional market	Metal pole
Cemetery		Concrete and wood pole
Cross (on agricultural land)		

5. CONCLUSIONS

The cultural landscape of the Baia de Criş area reflects local uniqueness, resulting from the accumulation of past material and spiritual culture in different social, political, economic and historical contexts.

Although this area still retains many characteristics of traditional and typical regional features, traditional cultural landscape images are becoming increasingly impregnated with other landscape images. Social and economic changes from contemporary period, affects the images of the traditional rural areas. Also the area's touristic elements had a great potential, but are not yet sufficiently exploited in terms of tourism.

It is therefore necessary to preserve and accept traditional rural cultural landscape as an expression of cultural heritage as the base (foundation) of national identity, (as was stated in the European Landscape Convention, 2000), which could strengthen the regional economy through an efficient conservation and exploitation of its natural and cultural resources (www.cdep.ro/pls/legis/legis.pck).

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RURAL HABITAT RESOURCES IN SOMEŞUL MARE HILLS

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ABSTRACT. – Rural Habitat Resources in Someşul Mare Hills. In the region of Someşul Mare Hills, natural conditions provided the human community the opportunity to act on the landscape, changing it to its interests. People created their own habitat so that they have optimal living conditions. Their presence in the area dates from ancient times, which is evidenced by the numerous artifacts and the ruins of camps during the Roman Dacia. Although the rural area has experienced a significant depopulation in the second half of the twentieth century, there is still a high demographic potential.

Keywords: *Someşul Mare Hills, rural habitat, natural resources, human resources, tourism potential.*

1. INTRODUCTION

By the way natural resources were exploited and ensured people's livelihoods, there is a hierarchy, both in terms of their importance to community life and in terms of how to exploit the existing natural potential. This proves the resilience of population to specific environmental and historical factors.

2. SOMEŞUL MARE HILLS. GEOGRAPHICAL LOCATION

Someşul Mare Hills represents a unit that includes quite a large area. The northern limit is represented by Ţibleş Mountains (from Lăpuş Depression to Salva Valley) and Rodna Mountains (between Salva Valley and Cormaia Valley), to the east narrows more and more to the mountain Someşul Mare river, and to the south up to Someşul Mare Corridor (from Sângeorz-Băi to Dej), while in west is bounded by Sălătruc Hills, Breaza Peak and Lăpuş Depression. The Someşul Mare Hills has three subunits: Ciceu Hills, Suplai Hills and Năsăud Hills.

The entire area between these limits forms a separate unit, comparable to those in its neighborhood, characterized by some specific elements: the whole area is drained by the right tributaries of the Someşul Mare River, it is almost completely welded to the northern mountain area, limits to the Ţibleş and Rodna Mountains being given by the alignment of small depressions (Molişet, Şendroaia, Suplai, Bichigiu-Telciu, Parva and Sângeorz-Băi) and high passes (Curmătura Largă, 521 m), the existence of the Neogene eruptive nucleus in Ciceu Hills and the presence in the vicinity of the Someşul Mare Corridor of an almost continuous strip of Dej tuffs, from Mocod up to Dej (Gr. G. Pop, 2001).

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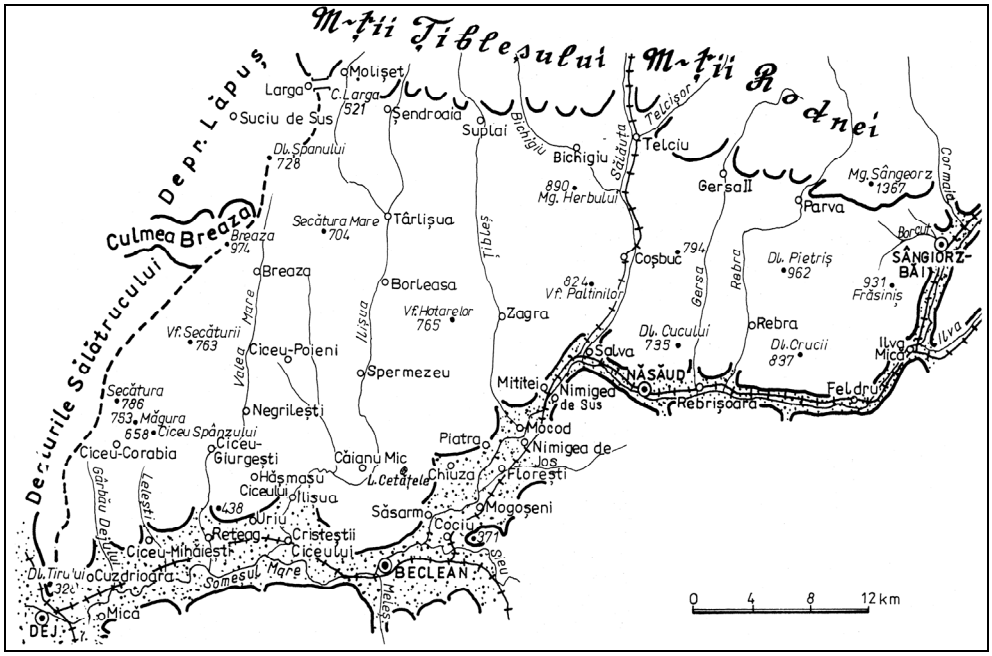

Fig. 1. Someşul Mare Hills. Geographical position. (According to: Gr. G. Pop, 2001, p. 162).

3. ANALYSIS OF SOMEŞUL MARE HILLS RESOURCES

Between humans and natural environment components there are complex relationships that manifest themselves through the exploitation of natural resources of all kinds. These relationships have developed in those times when people were only hunting and gathering vegetable products, but have diversified, and become increasingly complex when people passed to farming, melting and processing metals, discovered steam power and modern technology. Depending on one civilization or another, traditions, degree of education, culture, types of performed activities, spatial location in a region, people have different perception of relationships that exist between their needs and natural resource exploitation (P. Cocean et alii, 2003).

3. 1. Natural resources

3. 1. 1. Relief. According to Gr. G. Pop (2001), the general appearance of the relief is given by the presence of extensive ridges, north-south oriented, in accordance with the direction of the hydrographic system, easily separated from the mountain area, through the alignment of small depressions and high passes, so that in many cases it is difficult to separate the two units, namely mountain-hill. Moreover, hills altitude, in contact with the mountain area, is over 800 m in the west and almost 1000 m in Năsăud Hills and down to 400 m or less, in south (Someşul Mare Corridor).

Ciceu Hills. In this area, the predominant formations are the Miocene ones. In the northern part are present the oldest, represented by marly clays, sands and conglomerates, while in the southern part exists the new ones with tuff interposed between the volcanic sands and clays.

Suplai Hills. Waters that cross the hills have generated a fragmentation of this area, creating tight corridors and small depressions. They are formed from sedimentary rocks belonging to the Miocene and Quaternary. It is noted the absence of upper Miocene deposits and also the presence of rocks increasingly older, as we approach the Țibleş Mountains. The interplay between the layers of volcanic tuff ("Dej tuff ") and thick layers of sandstone in the clay, marl and sand, created a fragmented landscape (I. Chintăuan, 1998).

Năsăud Hills. They present one side pitched structure and are characterized "by the presence of Oligocene-Early Miocene formations (conglomerates, sandstones, carbonate clays, etc.) and Ottnangian formations, like: carbonate clays, sands, sandstones and conglomerates **(**Gr. G. Pop, 2001)

3. 1. 2. Climate. The type of climate is typical hilly areas, characterized by annual average temperatures down to 8.5 °C in the lower parts (near Someşul Mare Corridor), to 7 °C or less towards the mountains. Rainfall is high in the high mountainous region (1200 ml/year in Țibleş Mountains, over 1,400 ml/year in Rodna Mountains) while in the hills is lower, falling gradually to the south, to below 650 ml/year. The largest amount of precipitation falls in summer (37-42%), increasing from west to east. The rainiest month is June, when the values are between 88.6 ml and 130 ml in mountainous areas. The month with lowest amount of rainfall is January, for mountain areas (80-100 ml), and February for the hills area, their average value not exceeding 20 ml.

3. 1. 3. Hydrography. Someşul Mare Hills large area has a rich hydrographic system, being bordered to the south by the Someşul Mare Corridor, which has its origin in the contact area of Rodna and Suhard Mountains, and it is formed by the union of Zmău valley with Păltiniş spring. Its most important tributaries are Cormaia and Rebra (springing from southern part of Rodna Mountains), Sălăuța (springing between Țibleş Mountains and Rodna Mountains), Țibleş (Zagra), Ilişua and Valea Mare (springing from Țibleş Mountains). Rivers have bicarbonate waters (rivers in mountainous regions with igneous metamorphic rocks) and mixed. The first ones have a significant volume of good quality water, with an insignificant impurity (I. Chintăuan, 1998).

3. 1. 4. Soils. Geographical zoning elevation, lithology and humidity, have caused the emergence of some categories of soils. In the area studied there are two main types of soils namely Luvisols and Cambisols, after J. Benedek (2000), and WRB –SR (1998). Of Luvisols, the most common are Haplic luvisols, formed on clays, sandstones and conglomerates, under *Quercus petraea* or *Fagus silvatica* forests. It is poorer in humus soil (1,5 - 2%), with weaker biological activity and low pH. It has a good fertility for forests, medium for lawns, orchards and some agricultural crops (potatoes, fodder) and low for cereals and vegetables. There are also Albic luvisols, usually associated with Haplic luvisols. It has weaker physical properties, being used as pasture, except for some crops (potatoes, fodder). Among Cambisols, there are Eutric cambisols, formed on slopes, sometimes on high terraces and meadows on clay, marl and terrace deposits. It has good physical properties, being suitable for forest, grassland, cereals, industrial crops, fodder and also Dystric cambisols, which were formed on a substrate composed of more acidic rocks, under beech forests or mixed forests (beech-coniferous). It has a pH lower than 5, low humus content, low nutrient supply. Forests and grasslands were developed on it.

Mollic gleysols and Fluvisols with high permeability and high storage capacity of water also exist. These mentioned soils are suitable for vegetable growing practice. It notes the presence of soils with lower fertility, which are mainly used for pasture, hay and fruit trees. They are favorable for vegetable growing, viticulture or crops such as potatoes. They are generally less favorable for grains like corn or wheat (J. Benedek, 2000), and WRB – SR (1998).

3. 1. 5. Flora and fauna. The hills are covered with beech, hornbeam and oak forests, surrounded by crops, meadows and pastures. There are rare endemic relict species, endangered. There are 44 protected plant species and many animal species, as natural monuments. Fauna generally reflects vegetation zoning, but being in constant motion, areas beyond the limits of species are changing. Many invertebrates (especially insects) and vertebrates inhabit this land, but many have disappeared and others are endangered. In each fauna group there are rare and endangered species, some being protected as monuments of nature (species of butterflies, red ant, chamois, lynx, raven, etc.). In some groups of animals the number of species is unknown but is known in fish, reptiles, birds and mammals. Mammals, especially those that are hunted, have much to suffer; as the number of species is declining, some actually suffer fluctuations, while others always change their habitat, according to human pressure (I. Chintăuan, 1998).

Collection and use of resources provided by nature, must have regard to environmental capacity, in order to preserve the productive capacity of land and maintaining a dynamic equilibrium between man and his natural environment. Substances from the environment should be compensated by others (fertilizers, water, sun energy, human labor), so energy must be transferred to the natural environment, relationship with it being vice versa. At the same time, the natural environment through its specific form, resources and accessibility, influence these people, who adapt to the existing natural environment, which means recognizing the opportunities and needs. Population activity is largely determined by constraint adaptation (J. Benedek, 2000).

3. 2. Human resources

3. 2. 1. Settlements. Human presence, the organization that forms the habitat in the examined area, was attested, according to Gr. G. Pop (2001), by numerous archaeological materials from the Roman period, remaining traces of the camps in Ilişua and Zagra. It is also noted that in the late fifteenth century and the beginning of the next century, much of this territory was in possession of rulers of Moldavia, and later (1762-1851), during the Habsburg rule, was part from the Năsăud Border Land (<Ţinutul Grăniceresc Năsăudean>).

In the examined region, due to a long evolutionary process, are present 62 villages included in 20 administrative units (communes). They are "generally gathered-scattered, thus representing a widespread subtype, a crossing between the assembled structure and typical diffuse structure.

The village structure is: "*gathered, in the central valley and along its main tributaries and diffuse to the periphery along streams or on slopes*" (L. Nicoară, quoted by Oana-Ramona Ilovan, 2009, p. 291).

Settlements size is defined by the number of inhabitants (demographic potential) and has a great importance in the hierarchy of settlements and in explaining spatial patterns of agricultural exploitation. Village size, involve direct correlation with economic potential and leverage of land in certain socio-historical contexts. They, in time, contributed to the increase or decrease of the demographic potential (A. Maier, 2001).

Therefore, the 62 rural settlements may be grouped into: small, medium, large and very large villages, as follows.

Small villages (less than 500 inhabitants) include the following rural localities: Ciceu-Corabia, Leleşti, Hăşmaşu Ciceului, Şesuri Spermezeu Vale, Lunca Borlesei, Păltineasa, Sita, Alunişul, Fiad, Gersa II, Podirei, Hălmăsău, Agrieşel, Cireaşi, Lunca Sătească, Molişet, Oarzina, Răcăteşu, Şendroaia, Purcărete, Mireş etc.

Fig. 2. Ciceu-Poieni - scattered structure village.

This type of villages bear the mark of limited functions (mainly the farm) and usually at a low level, linked on the one hand to the modest demographic potential, on the other hand based on the disappearance of individual property - after 1962 - (A. Maier, 2001).

Medium villages (501-1500 inhabitants) are the following localities: Zagra, Perişor, Poienile Zagrei, Suplai, Telcişor, Gersa I, Bichigiu, Târlişua, Agrieş, Căianu Mare, Ciceu Poieni, Dobric, Dobricel, Dumbrăviţa, Ciceu Giurgeşti, Breaza, Dumbrăveni, Negrileşti, Uriu, Cristeştii Ciceului, Ilişua, Ciceu Mihăieşti, Baţa etc.

Large and very large villages (1501-3000 and over 3000 inhabitants) occupy an intermediate step between rural and urban settlements. They form a class of new towns that may occur, according to established criteria, representing a bridge between rural and urban system (Gr. G. Pop, J. Benedek, 1997). The area includes a small number of this kind of localities, such as: Reteag, Căianu Mic, Rebra, Rebrişoara, Salva, Coşbuc, Parva, Telciu and Feldru.

In conclusion, although in the twentieth century, the Romanian rural area, faced with the phenomenon of depopulation in Someşul Mare Hills, demographic potential was preserved quite well.

***3. 2. 2. Population*.** The intensity of change in the territory is determined by the number of inhabitants, temporal-spatial evolution of it, by the type of activity and use of space (W. Schreiber et alii, 2003).

The population study was conducted in the following administrative units: Petru-Rareş, Uriu, Ciceu-Giurgeşti, Căianu Mic, Spermezeu, Târlişua, Parva, Rebra, Rebrişoara, Coşbuc, Telciu, Salva, Zagra, Chiuza, Sângeorz-Băi, Ciceu-Mihăieşti, Feldru, Negrileşti, Nimigea and Năsăud, which comprise 62 localities.

Thus, a period of five years (2003-2007), was investigated in demographic terms. The population has decreased over the whole territory, from 90,544 inhabitants in 2003 to 87,296 in 2007, and by 3248 people on the whole, so that only four administrative units (Chiuza, Spermezeu, Telciu and Uriu) recorded increases, otherwise noticing decreases. In the administrative units analyzed, the evolution of the number of inhabitants was not performed at a constant steady, but by leaps, progressive or regressive.

3. 2. 3. Population density. This indicator reflects the demographic of the administrative units, expressed according to their area. So, in 2003, density values were between 257.410 inhab/km^2 in Năsăud and 18.770 inhab/km^2 in Telciu; in 6 administrative units values are between 30-40 inhab/km^2 (Ciceu-Giurgeşti, Coşbuc, Parva, Rebrişoara, Spermezeu, Zagra), in 2 administrative units values are between 70-80 inhab/km^2 (Petru Rareş, Uriu) and the remaining values are represented by one administrative unit.

In 2007, the population density was between 259.900 inhab/km^2 in Năsăud, 21.51 inhab/km^2 in Telciu, 3 administrative units had values between 20-30 loc/km^2 (Târlişua, Coşbuc, Zagra), 4 administrative units had values between 50-60 inhab/km^2 (Căianu Mic, Chiuza, Nimigea Spermezeu), 2 administrative units had values between 60-70 inhab/km^2 (Feldru, Rebra), 2 administrative units had values between 70-80 inhab/km^2 (Sângeorz-Băi, Uriu).

3. 3. Agricultural resources

Agricultural land is the key support of the biological human existence (V. Surd et alii, 2005). It comprises arable land, orchards, vineyards, pastures and meadows. In Someşul Mare Hills, agriculture is the main occupation of the rural population, practiced since ancient times.

Thus, in 2003, in the southern region, the agricultural area was between 60.5% and 84.7% (in Feldru, Petru Rareş, Uriu, Căianu Mic, Ciceu-Giurgeşti, Negrileşti, Chiuza, Nimigea, Rebrişoara, Salva, Năsăud, Căianu Mic administrative units) of the entire surface, while in north, the agricultural area was between 17.8% şi 64.2% (in Zagra, Spermezeu, Tărlişua, Sângeorz-Băi, Coşbuc, Parva, Telciu, Rebra administrative units).

Comparing 2007 data with previous ones, there is a reduction for a group of administrative units (Petru Rareş, Uriu, Căianu Mic, Ciceu-Giurgeşti, Coşbuc, Rebra, Salva, Telciu), significant increases (Spermezeu şi Zagra), and constant values (Târlişua, Negrileşti, Chiuza, Feldru, Nimigea, Parva, Rebrişoara and Năsăud).

Arable lands correspond to areas with a high productivity, proper for plant cultivation. Opposed to 2003, in 2007 there was a decrease of arable (of agricultural area) in Spermezeu, Rebra, Telciu and Năsăud while in Petru Rareş, Uriu, Căianu Mic, Coşbuc, Salva, Zagra, Ciceu-Mihăieşti increases were noticed and constant values in Târlişua, Negrileşti, Sângeorz-Băi, Feldru, Nimigea, Parva and Rebrişoara.

Cereals play an important role in the local agriculture through the extension of cultivated surface and by their importance in the agrarian economy of the region. The structure of arable land shows differences from one year to another at the administrative units level, the motivation being a consequence of complex factors current period, as modest mechanization, aging workforce, agricultural market instability, etc. (Gr. G. Pop, 2007). Data years taken in the study (2003-2007), reveals that the region's arable land was occupied primarily for grain corn, wheat, potatoes and vegetables, and among crops, the sunflower.

Most non-arable agricultural land is occupied by pastures and meadows. These are the main feed source, accounting for large areas in the Someşul Mare Hills, thanks to the physical geography of these regions.

Their surface is different. Pastures recorded decreases over the interval studied (2003-2007) in Petru Rareş, Uriu, Spermezeu, Ciceu-Giurgeşti, Chiuza, Coşbuc, Zagra, increasing values in Căianu Mic, Rebra, Salva, Telciu and constant extent in Negrileşti, Ciceu Mihăieşti, Târlişua, Sângeorz-Băi, Feldru, Nimigea, Parva, Rebrişoara, Năsăud[3].

Meadows have great extent in Spermezeu, Uriu, Ciceu-Giurgeşti, Coşbuc, Rebra, Zagra, Năsăud, less extent in Căianu Mic, Petru Rareş, Chiuza, Salva, Telciu and constant extent in Ciceu-Mihăieşti, Negrileşti, Târlişua, Sângeorz-Băi, Feldru, Nimigea, Parva, Rebrişoara.

[3] The method of presenting data in the table on Ciceu Mihăieşti village is because until 2003 it was included as a component of the Petru Rareş commune, subsequently becoming commune in 2005, according to Law 67/2005.

Farmland structure in Someşul Mare Hills

Table 1

Administrative unit		Surface, total	Agricultural land		Arable		Orchard		Vine yard		Pasture		Meadow	
		Ha	Ha	%	Ha	%	Ha	%	Ha	%	Ha	%	Ha	%
Petru Rareş	1	6506	4244	65.2	1685	39.7	475	11.2	18	0.4	1448	34.1	618	14.6
	2	3008	1884	62.6	942	50.0	194	10.3	14	0.7	518	27.5	216	11.5
Uriu	1	4830	3211	66.5	1492	46.5	133	4.1	7	0.2	1139	35.5	440	13.7
	2	4830	3106	64.3	1491	48.1	133	4.3	7	0.2	798	25.7	677	21.8
Spermezeu	1	6964	3353	48.1	1260	37.6	3	0.1	-	-	1473	43.9	617	18.4
	2	6964	5721	82.1	1986	34.7	39	0.7	-	-	2289	40.0	1407	24.6
Căianu Mic	1	7406	6273	84.7	2527	40.3	36	0.6	2	-	2245	35.8	1463	23.3
	2	7406	3905	52.7	1801	46.1	-	-	-	-	1429	36.6	675	17.3
Târlişua	1	16083	6598	41.0	1384	21.0	-	-	-	-	3094	46.9	2120	32.1
	2	16083	6598	41.0	1384	21.0	-	-	-	-	3094	46.9	2120	32.1
Ciceu-Giurgeşti	1	5301	3373	63.6	1001	29.7	78	2.3	-	-	1090	32.3	1204	35.7
	2	5301	3184	60.1	994	31.2	78	2.4	-	-	908	28.5	1204	37.8
Ciceu Mihăieşti	1													
	2	3498	2252	64.4	843	37.4	281	12.5	4	0.2	520	23.1	604	26.8
Negrileşti	1	6066	4302	70.9	902	21.0	30	0.7	-	-	2160	50.2	1210	28.1
	2	6066	4302	70.9	902	21.0	30	0.7	-	-	2160	50.2	1210	28.1
Sângeorz-Băi	1	14682	6640	45.2	856	12.3					3645	54.9	2139	32.2
	2	14682	6640	45.2	856	12.3	-	-	-	-	3645	54.9	2139	32.2
Chiuza	1	4421	2695	61.0	1245	46.2	179	6.6	1		651	24.1	619	23.0
	2	4421	2695	61.0	1467	54.4	179	6.6	1		579	21.3	469	17.2
Coşbuc	1	9196	4094	44.5	206	5.0					3335	81.5	553	13.5
	2	9196	1652	18.0	227	13.7	-	-	-	-	893	54.0	532	32.2
Feldru	1	11975	7248	60.5	1419	19.6	92	1.2			3215	44.4	2522	34.8
	2	11975	7248	60.5	1419	19.6	92	1.2	-	-	3215	44.4	2522	34.8
Nimigea	1	9836	7111	72.3	2869	40.3	229	3.2			2488	35.0	1525	21.4
	2	9836	7111	72.3	2869	40.3	229	3.2	-	-	2488	35.0	1525	21.4
Parva	1	7065	2771	39.2	304	11.0					1512	54.6	955	34.4
	2	7065	2771	39.2	304	11.0	-	-	-	-	1512	54.6	955	34.4
Rebra	1	4581	2941	64.2	504	17.1	1	-			1445	49.1	991	33.7
	2	4581	2855	62.3	419	14.7	1	-	-	-	1445	50.6	990	34.7
Rebrişoara	1	13687	5840	42.7	1515	25.9					2960	50.7	1365	23.4
	2	13687	5840	42.7	1515	25.9	-	-	-	-	2960	50.7	1365	23.4
Salva	1	5496	3550	64.4	1556	43.8	17	0.5			1332	37.5	645	18.2
	2	2935	1892	64.5	871	46.0	12	0.6	-	-	720	38.1	289	15.3
Telciu	1	29142	7937	27.2	730	9.2	7	0.1			2921	36.8	4279	53.9
	2	29142	10380	35.6	751	7.2	7	0.1	-	-	6058	58.4	3564	34.3
Zagra	1	12600	9051	17.8	2802	34.0	27	0.3			4669	51.6	1553	17.2
	2	12600	8187	65.0	2802	34.2	27	0.3	-	-	3805	46.5	1553	19.0
Năsăud	1	4325	3243	75.0	1110	34.2	121	3.7	3	0.1	1167	36.0	842	26.0
	2	4325	3245	75.0	1102	34.0	121	3.7	6	0.2	1168	36.0	848	26.1

Ha = area (Ha); 1 = *year 2003; 2 = year 2007*.

Agricultural density. Anthropogenic pressure on the geographical landscape of Someşul Mare Hills (an area with agricultural economy), is highlighted by the agricultural area per capita. This indicator shows high pressure in 2003 in Năsăud, Sângeorz-Băi, Uriu, Salva, Petru Rareş, Rebra, Feldru, Salva and a lower one in Zagra. In 2007 this indicator shows a low pressure in Zagra, Spermezeu, Târlişua, Ciceu-Giurgeşti, Negrileşti etc. and a high pressure in Năsăud, Petru Rareş, Uriu, Feldru, Salva.

3. 4. Tourism potential of Someşul Mare Hills

Tourism potential includes all natural and anthropogenic specific elements put out by tourist facilities. Intern or international tourists traveling to areas of destination where "use" tourism in a particular manner (N. Ciangă, 2002). „*Unlike the natural resources, which area gift of nature, heritage tourism is the foundation of anthropogenic cultural tourism, is a summation of elements with recreational function, created by man himself*" (P. Cocean, 1992, p. 105).

Fig. 3. Ciceu Citadel in Someşul Mare Hills.

Thus, according to V. Surd (2008), the first element that attracts the visitor's attention to these places is the originality of the folk, as an expression of an impressive artistic sense of the people, who, for millennia, have passed from generation to generation, the specificity and enrichment. Both the male and the female clothes are embellished with interesting floral motifs. The hats, worn by young people, are decorated with rosettes made of peacock feathers and long doublets are decorated with rows of large colorful woolen tassels. Local weddings, dances,

songs by a fine sensibility, are the genuine manifestation of popular customs and traditions. Folk traditional festivals, like "Sheep Measurement" in Zagra, New Year's customs and work-related specific seasons, become a true exhibition of song, dance and port. Archeological discoveries reveal a continuous habitation in this area, since the Paleolithic. There are traces like the ruins of camps in Ilişua and Zagra, Ciceu citadel ruins, etc. Also, the wooden churches of Spermezeu, Sângeorz-Băi, Rebra, Zagra, are genuine historical and architectural values. Romanian cultural and art personalities such as: Liviu Rebreanu, George Coşbuc, and Mureşanu brothers come from these lands. Several monuments, museums and memorial houses were built or arranged in their memory (ex. George Coşbuc Memorial house, Liviu Rebreanu Memorial house, Sângeorz-Băi Museum etc). The potential is supplemented with numerous mineral water springs and rich game. Sângeorz-Băi climatic spa resort was arranged and developed on the basis of their existence. It has many soda, bicarbonate, chloride, sodium, calcium, magnesium springs, plus weak ferruginous mineral spring mud and unmitigated climatic factors. Through the value of treatment factors and modern therapeutic procedure facilities this resort has international importance. Hotels from Năsăud and Sângeorz-Băi, houses, villas, hunting lodges and sightseeing, tourist journeys, the network of restaurants, bars and bistros, the spa and leisure complex complete the objectives of material tourism heritage.

Tourism is very poorly developed, except Sângeorz-Băi (focused on health tourism, due to the presence of therapeutic mineral waters). But the natural resources of the attractive, especially *"... impressive chest of drawers of the creative spirit of these places specific for this people - ethnic and folk traditions, costumes, museums, monuments and historical artifacts"* (M. Mureşianu, 1997, p. 70), offer the posibility of practicing an excellent cultural tourism.

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THE ANALYSIS OF THE ANTHROPOGENIC INDUCED ELEMENTS IN TRASCĂU MOUNTAINS

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ABSTRACT. – The Analysis of the Anthropogenic Induced Elements in Trascău Mountains. The current paper represents an analysis of the anthropogenic induced elements from Trascău Mountains, in terms of the surfaces which are used by the human communities for different purposes. In the analysis of the anthropogenic component, we have calculated the numeric evolution of the population in the last century when significant changes occurred in the total number of inhabitants; in the same time, the current paper comprises an analysis of the types of settlements identified within Trascău Mountains which are the result of the adaptation to the morphology of the relief (scattered, dotted about or congregate settlements being therefore identified) as well as the values of several parameters used in order to make an assessment of the human impact within the analyzed territory. The geographical space of Trascău Mountains presents itself as an adequate element of favorability for the development of human communities, the natural components offering (by means of the existing resources) both the basis and the proper means for the existence and development of the anthropogenic element. The current structure of the land use is the result of the changes that have occurred in the economy of the existing rural settlements; the agricultural activities developed in the lower parts of the analyzed unit are replaced towards the areas located at higher altitudes by animal husbandry or by other related activities.

Keywords: *Trascău Mountains, geographical space, anthropogenic induced elements.*

1. INTRODUCTION

The purpose of our study is to present the current state and configuration of the geographical space of Trascău Mountains as a consequence of the development of human settlements and of the modifications that have occurred in the state of the existing elements as a result of the anthropogenic activities developed in recent years. In order to do so, we will try to make an analysis of the population identified within the analyzed territory (in terms of its numerical evolution, typology of settlements and areas most favorable for the development of human communities) as well as to present the changes that have occurred in the structure of the land use in the last two decades as a direct consequence of the population's requirements for land and new surfaces (used for different purposes). In the same time, in order to make an assessment of the anthropogenic stress within the analyzed territory we have appealed to the calculation of several parameters such as the physiological density, the dispersion coefficient for the entire surface of Trascău Mountains and the density of settlements.

The geographical space of Trascău Mountains presents itself as an adequate element of favorability for the development of human communities, the natural component offering (by means of the existing natural resources) both the basis and the proper means for the existence and development of the human element.

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In the analyzed territory, the settlements are represented by the existing villages, the geographical space of the Trascău Mountains being therefore an entirely rural one where the main providing activities belong to the primary sector (represented by the agriculture and animal husbandry). In the same time, as a result of the recent development of road and communication infrastructure, and based on the invigorating attributes of the natural elements, the economy of many rural settlements has recorded significant increases, as a result of the development of touristic-related activities, in many locations throughout Trascău Mountains being built boarding houses or pensions of different categories, for all sorts of tourists.

The development of human communities determined the appraisal of organized rural centers, where the households are build either close to another (in the areas where the relief permitted), either are spread on the slopes of the hills or on the plateaus (in the higher areas), resulting villages that are located both at the extremity and within the analyzed unit. From an administrative point of view the settlements belong to Alba and Cluj Counties and consist in a total number of 76 villages as part of 21 administrative territorial units (15 of which are part of Alba County, while only 6 belong to Cluj County).

In our study and for the evaluation of the anthropogenic stress (in terms of the above mentioned analyzed parameters) we have made the calculations according to the statistical data provided by the Departments of Statistics from Alba and Cluj Counties. The data used in our study are represented by the total number of the population from the analyzed administrative territorial units[1], as well as the data regarding the structure of the land use from the last two decades and the data recorded in the fact sheets of each administrative unit, for the 1990-2009 intervals.

2. THE ANALYSIS OF THE ANTHROPOGENIC COMPONENT

The villages and settlements from Trascău Mountains represent the nucleus of human existence, the communities encountering in these areas all the necessary conditions for their establishment and development. Regarding the permanence of the population within the analyzed unit we must mention the fact that these territories have been inhabited since the Neolithic period, the historical habitation and evolution of the communities being proved and confirmed by the large number of archeological findings spread throughout the territory. In the same time, and as an adaptation to the conditions of the relief, the most practiced existential activity of the local population was the agriculture, many of the discovered artifacts attesting the development of this type of activity. In this regard, we sustain that since these settlements are entirely rural, it is almost required for the local population to practice the agriculture (along with all the other activities deriving from it) or other primary activities.

As mentioned in the introductory part of the current paper, the villages belong to Alba and Cluj counties, as part of 21 administrative territorial units, each of them recording, throughout the time, fluctuations in the total number of inhabitants. These fluctuations had many causes, on one part the increases were partially due to the existing old legislation (the pro-natal policy of the communist regime and implicitly the interdiction of the abortion), while the recent decreasing values (recorded since the year 1992) are partially the consequence

[1] In order to present the numerical evolution of the population we have used the data recorded at the 1956, 1966 1977, 1992 and 2002 censes, as well as the data provided by the data fact sheets of the analyzed territorial units for the 2003, 2004, 2005 and 2009 years.

of the abolition of this policy and partially the result of the process of demographic aging of the population as well as a consequence of the emancipation of younger population, many of the young married couples having no more than 1 or 2 children.

The analysis of the numerical evolution of the population revealed two major periods of fluctuations, corresponding to the first, respectively to the second half of the last century: between 1900 and 1956 the total number of the population recorded some variations, in the first two decades the general tendency was the decrease, followed by a significant increase in the number of inhabitants per the entire analyzed territorial units; the second half of the last century is characterized by a general tendency of increase in the number of the population from 1956 (97105 inhabitants being recorded) to 1977 (when a total of 98340 inhabitants were recorded). After this period, the general trend was the continuous decrease, between 1977 and 2002 significant fluctuations being recorded (at the 2002 census, within the analyzed administrative units, 87140 inhabitants were accounted). For the year 2009, the general tendency kept its decreasing values; a total number of 82510 inhabitants were recorded.

Even though the general tendency per the entire analyzed territory is the decrease in the total number of the population, there are some cases where, slightly increasing values were recorded as a result of the increase of the life conditions offered by these rural areas (the case of Tureni commune which in 2002 recorded 1585 inhabitants, and in 2009 the total number of inhabitants was 2505; Ighiu commune recorded in 2002 a number of 6432 inhabitants while in 2009 the population reached 6518 inhabitants; the case of Mihai Viteazu commune which in 2002, had 5749 inhabitants and in 2009, 5832 inhabitants) due to the development of better sanitary services, improvement of communication and transport infrastructure, advancement of new sources of income (as a consequence of the establishment of new working environments such as boarding houses, restaurants, branch offices of different banks and national companies, etc.).

On the other hand, there are villages where the number of inhabitants is in a continuing decrease (as a consequence of the fact that within these villages, the population is represented entirely by elders), a situation which can put in uncertainty their future existence (the case of some villages located within the territory of Întregalde commune or of several villages belonging to Râmeț commune).

In regards to the general density of the population within the analyzed area and using the data fact sheets for the given administrative territorial units for the year 2009, we have made the calculations accordingly, and we have obtained different values of this parameter. The analysis of the density of the population revealed that the areas located at the northern, north-eastern and eastern extremity of Trascău Mountains posses higher values as opposed to the villages developed in the central part or to those located towards the western part.

The lowest rates of this parameter were recorded by Râmeț, Ocoliș, Întregalde and Poșaga communes (with values ranging from nearly 7.53 inhabitants per 100 sq km, as is the case of Râmeț commune, to 9.50 inhabitants per 100 sq km – the case of Poșaga commune). The communes located in the northern and north-eastern part of Trascău Mountains recorded values ranging from 17.18 inhabitants (the case of Livezile commune) to 22.92 inhabitants per 100 sq km (the case of Petreștii de Jos commune), respectively to 25.37 inhabitants per 100 sq km (as is the case of Moldovenești commune). Higher values of the general density of the population were recorded by Iara (30.99 inhabitants per 100 sq km), Zlatna (32.30 inhabitants per 100 sq km), Tureni (33.58 inhabitants per 100 sq km) or Stremț (37.83 inhabitants per 100 sq km) communes. For the administrative units located in the proximity

of several larger urban areas (such as the towns Turda, Aiud or Alba-Iulia), the general density of the population possesses the highest values, Galda de Jos and Ighiu communes recoding values between 40.05 inhabitants per 100 sq km, respectively 50.92 inhabitants per 100 sq km, while the administrative units Mihai Viteazu and Aiud recorded values of 123.66 inhabitants per 100 sq km, or even 182.73 inhabitants per 100 sq km. The different values of this parameter are reflected by the dispersion of the population throughout the entire analyzed territory, the villages located in higher areas or on the plateaus, possessing fewer inhabitants as opposed to those located in the depressionary areas or along the water courses.

In studying the distribution of the population from Trascău Mountains we have appealed to the analysis of another parameter, namely to the areality coefficient, which reflects the reverse values of the population's density and is represented as a ratio between the total surface which corresponds to an inhabitant. Calculating the corresponding data of all the 21 analyzed territorial units, we have obtained different values of this parameter. For the year 2009, the value of this coefficient varies from 0.022 sq km/inhabitant (value recorded by Galda de Jos commune), or 0.058 sq km/inhabitant (in the case of Livezile commune) to 0.126 sq km/inhabitant (in the case of Ocoliş) or to 0.132 sq km/inhabitant (as is the case of Râmeţ commune). In this case as well, the fluctuations in the total number of the population are reflected by the values of the areality coefficient, the decrease of the population determining therefore the increasing values of this parameter.

The values of the parameter physiological density, for the year 2009

Table 1

Crt. no.	The analyzed territorial units	Physiological density
1	Râmeţ, Întregalde	<0.20
2	Ocoliş, Petreştii de Jos, Sălciua, Livezile, Poşaga, Moldoveneşti, Rimetea	0.21 – 0.40
3	Tureni, Meteş, Iara	0.41 – 0.60
4	Miraslău, Galda, Stremţ,	0.61 – 0.80
5	Cricău, Zlatna, Ighiu,	0.81 – 1.00
6	Sănduleşti, Mihai Viteazu, Aiud	>1.01

In order to make an assessment of the human impact within the analyzed region, we have appealed to the calculation of the parameter physiological density, which reflects the state of the anthropogenic stress on the environment, and is represented by the total number of inhabitants which corresponds to a hectare of agricultural land.

For each of the 21 administrative territorial units, the values of this parameter are rendered in table 1. For the year 2009 we have obtained different values of this coefficient, a situation which facilitated the assortment of the administrative units into six different categories.

The values range from under 0.20 inhabitants/ha of agricultural land to more than 1.89 inhabitants/ha of agricultural land. The obtained results show that the administrative units which recorded the lowest values are similar to those where the total number of the population is reduced or where a decreasing tendency is recorded. In this case as well Râmeţ and Întregalde communes recorded the lowest values, while Aiud recorded the highest value (3.68 inhabitants per hectare of agricultural surface).

3. TYPOLOGY OF THE SETTLEMENTS

In regards to the typology of villages, we must mention that, the population by means of its numerical values is the one directly responsible for the size and viability of

these settlements. According to their demographic capacity, the villages from Trascău Mountains, are small and medium sized, the number of population varying from 5 or 6 inhabitants per village (the case of Cheia or Zăgriş villages) to 1027 inhabitants (the case of Tureni village) or even 1290 inhabitants (as is the case of Cricău village), as recorded at the last census in 2002.

The analysis of the demographic typology of the rural settlements reveals that 67% of the analyzed villages posses fewer than 1000 inhabitants, a value which includes them in the category of small and medium sized settlements. This situation is explained, on one hand as a consequence of the aging process which plays an important role in the values of the birth rate (as mentioned above there are some villages where the entire population is represented by 5 or 6 persons, many of them being 65 or more years old) and on the other hand, as the result of the adaptation to the morphology of the relief, the villages located at higher altitudes possessing fewer inhabitants as opposed to those located in the depressionary or lower areas.

The classification of the villages according to their demographic capacity, in 2002

Table 2

Type of village	Demographic capacity	No. of villages	No. of inhabitants	No. of inhabitants / village
Small sized	Under 100 inhabitants	28	1390	37.57
	100 – 500 inhabitants	30	7366	184.15
Medium sized	500 – 1000 inhabitants	11	7939	567.07
	1000 – 1500 inhabitants	7	8192	910.22
Total		**76**	**24887**	**327.46**

In terms of the morpho-structural typology of the villages, in many cases the hydrographic network was the one that influenced the spreading of the settlements, many of them (over 95%) being located in the nearness of some water sources. As an adaptation to the relief, the morphology and structure of the settlements are diverse, within the analyzed region, scattered, dotted about or congregate type of villages being identified.

Also, in relation to the heart of the settlement, there are the linear or tentacular villages. In terms of texture, the villages of the analyzed region posses a linear (by its self or in combinations) or irregular textures. An analysis regarding the distribution of the settlements within Trascău Mountains reveals that the existing villages can be divided into two categories, namely into bordering villages (which are represented by the settlements located at the periphery of the analyzed region) and into internal ones (which are located towards the inner parts of the territory, or in the depressionary areas – the case of Rimetea and Colţeşti villages, or on the plateaus – such is the case of Râmeţ village).

As mentioned above, within the geographical space of Trascău Mountains the settlements are entirely rural; the dominant activity is therefore represented by the agriculture. As a result, the primary developed activity induces the main features of this rural space. In this regard, as taking into account [according to Violette Rey et. al., 2002] a series of 11 social and economic parameters (density of the population, size of the settlements, level of rurality, agrarian pressure, aging degree of the population, comfort and equipment of the households, surfaces cultivated with wheat and surfaces cultivated with sun-flower, as well as the average surface of the agrarian surfaces and the average degree of association of these surfaces) we have included the analyzed administrative territorial units into three categories, as follows: rural spaces relatively well

equipped that possess a diverse rural economy (in this category the following communes are included: Iara Mihai Viteazu, Sănduleşti, Cricău, Galda de Jos, Ighiu, Miraslău, Rimetea, Sălciua and Stremț); rural spaces that are aged and are located in inaccessible geographical areas, with a precarious agrarian economy (which include Moldoveneşti, Petreştii de Jos, Întregalde, Livezile, Ocoliş, Poşaga and Râmeț communes) and rural spaces that are aged and posses a subsistence agrarian economy (represented by Tureni and Meteş communes).

In regards to the geographical space organization of Trascău Mountains, R. Rusu (2007) presents a detailed analysis identifying several taxonomic units according to their position within the analyzed region, the development of households in the different parts of the area being therefore a consequence of their adaptation to the morphology of the relief. As such, he distinguishes:

- *the western corridor* (representing in the same time the western border of Trascău Mountains with the Metaliferi Mountains) which dominated by the Ciumerna – Bedeleu steep slopes presents itself as a polarizing area for the surrounding mountain regions, and where the majority of settlements are spread along the water courses or nearby (such is the case of Sfârcea and Necrileşti villages which area spread alongside the Găldița River, Întregalde and Modoleşti villages are on Galda, Cheia on Râmeț, Valea Poienii on the homonymous river, Sub Piatră village is on Valea Morilor, Sălciua de Jos, Poşaga de Jos, Lunca and Ocoliş on Arieş or nearby, Ocolişel on Ocolişel, Făgetu Ierii on Iara);

- *a western plateau* which is dominated by the development towards its northern, western and southern parts by steep slopes representing a well edified morphological alignment with more than 600 m difference in altitude. Even though there do not exist permanent human settlements, there is a multitude of sheds, barns, sheepfolds and small dwellings which are used by the population from the surrounding villages as temporary residences during springtime and summertime when they take the cattle up on the plateau to graze, or are used as storage facilities (mainly for the storage of hay);

- *one central corridor* which is developed from the northern part of Trascău Mountains towards the south, from Tureni village to Zlatna crossing valleys, depressionary areas and cols, an area where a total number of 25 human settlements are identified. In this regard we must mention that most of these settlements are developed in depressionary areas (the villages Petreştii de Mijloc, Petreştii de Sus and Borzeşti are located in the Borzeşti Depression, the villages Rimetea, Colțeşti, Vălişoara and Izvoarele are in Trascău Depression, Lunca Meteşului and Lunca Ampoiței villages are spread in Lunca Ampoiței Deprssion, while the villages Feneş, Podu lui Paul, Presaca Ampoiului are developed within Zlatna depressionary basin);

- *a central range* represents in fact a longitudinal alignment of ridges and peaks, deeply fragmented by rivers, which by means of epigenetical processes have determined the formation and current physiognomy of the spectacular gorges identified within;

- *the eastern plateau* is located at the eastern part of Trascău Mountains and is characterized by a mosaic of types of land use, from the extended areas occupied by broadleaf forests, to the ones occupied by grassland and hayfields or to those used for the cultivation of crops, orchards or vineyards. In regards to the human component, the communities encountered adequate conditions for their establishment, the majority of the villages being developed on the water courses, a situation which imprinted their linear physiognomy;

- *an eastern contact area* which is represented by the area comprised between the Trascău mountain space and the Trascău piedmont representing in the same time a contact area between the northern mountain space and the eastern hilly and depressionary area. The human

settlements are represented by the villages belonging to Săndulești, Moldovenești, Livezile and Cricău communes. As for the viability of human communities within this area we mention the fact that, the villages posses a larger number of inhabitants (for example in comparison with the villages from the western part of Trascău Mountains) as a consequence of the diversification of the economical activities (the construction of the A3 motorway, the establishment of new office branches of several multinational companies etc.) which played an important role in the social and economical development of these rural communities (the value of the income per family grew exponentially in the cases where one or more members of the family are employed by such a company).

In regards to the density of settlements, we must mention that there is a moderate distribution within the entire analyzed unit, a concentration of the villages in the lower areas, along the water courses or in the depressionary areas being however observed, while the higher areas, the hills and plateaus posses more scattered and isolated settlements. The values of the density of settlements are also varied per each analyzed territorial unit, ranging from 3.91 villages/100 sq km (the case of Ighiu commune), to more than 7.48 villages/100 sq km (as is the case of Zlatna administrative unit) or 9.59 villages/100 sq km. The highest values of the density of settlements are recorded by Galda de Jos (10.78 villages/100 sq km), Întregalde (10.78 villages/100 sq km) and Râmeț communes (16.46 villages/100 sq km).

In order to present the current state of dispersion of the settlements in Trascău Mountains and due to the fact that within the analyzed region the administrative territorial units do not include all their comprising villages, and as a consequence of the fact that the total number of the population possesses different values per each village, we have appealed to the analysis of the dispersion coefficient, which, according to Demangeon [N. Baciu, 2006], represents the virtual number of villages with an equal number of population within a commune.

The dispersion coefficient for the analyzed territorial units, for the year 2002

Table 3

Crt. no.	Territorial administrative units	Id
1	Mihai Viteazu	< 1.00
2	Rimetea, Cricău, Săndulești, Ocoliș, Stremț	1.01 – 2.00
3	Livezile, Aiud, Tureni, Miraslău, Sălciua, Moldovenești,	2.01 – 4.00
4	Ighiu, Petrești de Jos, Poșaga	4.01 – 6.00
5	Galda de Jos, Iara	6.01 – 8.00
6	Zlatna, Întregalde	8.01 – 10.00
7	Meteș, Râmeț	> 10.01

The dispersion coefficient (I_d) for each analyzed territorial administrative unit, for the year 2002 is presented in table 3 and was calculated using the formula $I_d = (C-CC)*S/C$, where C represents the population of a commune, CC – the population of the centre of commune and S is the total number of comprising villages of the commune.

Analyzing this parameter we have obtained different results, on one hand the situation is explained by the fact that there are communes which posses larger number of villages then others, and on the other hand by the fact that there are cases where the population of the commune center possesses more increasing values than others similar centers or where it's total population represents a large percentage of the entire number of inhabitants within that commune.

The lowest value of the dispersion coefficient is recorded by Mihai Viteazu commune who in 2002 recorded a total number of inhabitants of 5749, while its commune center had

a population of 4373. Values ranging from nearly 1.15 to 3.95 are identified in the majority of the analyzed administrative units, while the highest values are observed in the case of Meteş and Râmeț communes (the value of the dispersion coefficient is 10.43, respectively 11.89).

4. THE EVOLUTION AND CURRENT STRUCTURE OF THE LAND USE

Throughout the history the land served not only as mean of existence and source of habitation, but was also used for the cultivation of crops or other necessary nutritional plants as well as for the construction of households. In the past the local inhabitants used a combination of clay and water for the filling of the houses, while the wood from the forests served as raw material for the construction of the dwellings, for the roofs or for other household annexes, as well as a source of heat for these households. As a result, the human communities have continuously modified the natural environment according to their constant requirements for food and shelter. The current state of the structure of the land use is the result of the evolution of the local population's need for assuring its means of existence in terms of transforming the natural resources according to its demands.

In the same time the development of the economical activities within Trascău Mountains, was based on the exploitation of the natural resources which determined changes in the structure of the land use. Due to the fact that within these areas the agricultural activities encountered favorable conditions of development, the surfaces used for the cultivation of crops or for grasslands and hayfields became more and more extended, in most of the times, to the detriment of the natural vegetation, many surfaces occupied initially by forests being now used as grasslands. As mentioned above, the main practiced economical activity is the agriculture, followed by the animal husbandry, the natural components offering the proper means and basis for the development of this type of activities.

According to the Law no. 18/1991, the land use is represented by the entire surfaces of land found on Romanian territory, regardless of their destination and which are owned based on a title deed by any public or private parties. In the current section of this paper we will present the evolution of the structure of the land use in terms of the surfaces occupied by the agricultural lands (arable and agrarian lands, grasslands, hayfields, orchards and vineyards) of the administrative territorial units comprised within Trascău Mountains.

In the last two decades, different changes occurred in the structure of the land use, the abolition of the communist regime determining the disappearance of the socialist agrarian units and their replacement with new individual or familial type of exploitation of the lands. The embodiment of the Law no. 18/1991 regarding the land use had both positive and negative effects, on one hand it restored to the rightful owners the land surfaces which were taken by the communist regime, and on the other hand determined the fragmentation and the dissolution of the land property and its excessive parceling.

Analyzing the data regarding the surfaces with agricultural destination for the 1990-2009 periods, for all the analyzed administrative units, we have distinguished three stages of evolution: one developed between 1990 and 1998 when a decreasing tendency of these surfaces was recorded (the total surface of agricultural lands decreased from 105786 ha to 102520 ha); a second stage of evolution developed between 1999 and 2002 which represented a period of fluctuating values – in 1999 a slight increase being however recorded (more than 103860 ha being occupied by agricultural surfaces), followed by a decrease of these surfaces between 2000 and 2001 (the total agricultural surface was about 102924 ha); the third period developed between

2002 and 2009 recorded constant values of the agricultural surfaces. Within this last period, the total surface varied between 104095 ha (in 2002) to 103730 ha (in 2006), a period which was then followed by an increase of the total surfaces, reaching in 2009 approximately 104854 ha.

In the same time, the values of the arable surfaces encountered fluctuations, in this case as well the analysis of the data revealing three stages of evolution: one between 1990 and 1994 when a sudden drop of the values of the entire arable surfaces was recorded (from 38968 ha to 33490 ha); a second period between 1995 and 1999 which is characterized by constant values of the surfaces, ranging from 34507 ha to 35803 ha and a third period, between 2000 and 2009 which is also characterized by constant values of the surfaces but which recorded more increasing values (from 36044 ha in 2003 to 36638 ha in 2009) as opposed to the 1995-1999 interval.

In regards to the surfaces occupied by grasslands, for the analyzed period, we have distinguished two stages of evolution, one characterized by a decrease of these surfaces (from 41842 ha in 1990 to less than 39950 in 1992), and a second one in which a constant tendency was recorded, several smaller fluctuations being however recorded (in the year 2000 the total surface occupied by grassland was 41387 ha while in 2009 was about 40295 ha). The surfaces occupied by hayfields, for the analyzed period and for all the administrative territorial units comprised within Trascău Mountains, possessed somehow balanced values, only small fluctuations being recorded: from 22203 ha in 1990, to 24027 ha in 1999, or to 26816 ha in the year 2009.

Between the analyzed interval, the areas used for the development of orchards and vineyards have recorded more significant fluctuations in terms of decreasing values, three stages of evolution being recorded in this last case as well: a period between 1990 and 2000 when constant decreasing values were recorded; a period between 2000 and 2005 when the general tendency of decrease was however constant and a third period of continuous decrease between 2006 and 2009 (in the last year only 654 ha of vineyards and 431 ha of orchards were recorded).

The current structure of the land use per the entire analyzed administrative units, for the year 2009 reveals that more than 50% of the entire surface is occupied by the agricultural lands, 17% is occupied by arable land, 19% of the entire surface is used as grassland, 13% as hayfields, while 1% of the surfaces is occupied by orchards and vineyards.

5. CONCLUSIONS

Trascău Mountains represent a complex territory where the natural elements combined with the anthropogenic induced ones participate to the realization of a mosaic of landscapes, and where the different type of land use influences the main economical activity developed within. In the areas where the surfaces occupied by agricultural or arable land are more extended, the main activity is the agriculture, while in the areas where the grassland and hayfields are dominant the animal husbandry is more developed.

The adaptation to the natural conditions is reflected by the physiognomy of the rural settlements, the linear type of villages being present along the water courses; the depressionary areas imprinted the congregate feature of the villages, while the plateaus and hilly areas determined the appraisal of the dotted about villages, where a spreading of the households can be observed. As a consequence, the current dispersion of the anthropogenic component within the analyzed territory is the result of its adaptation to the conditions imposed by the relief, the lower and depressionary areas being more inhabited, while the higher ones and the plateaus, posses

more isolated households. Also, the adaptation to the morphology of the relief played an important role in the diversification of the economical activities, the areas located at higher altitudes being used as pastures, while the lower more flattened surfaces are used for the cultivation of crops and vegetables; the moderate slopes of the hilly areas are used for the development of orchards and vineyards.

Regarding the human elements identified within Trascău Mountains, we mention that the number of the population recorded fluctuating values in the last century as a result of the different social and economical events that have occurred in the life of the local population. Nowadays, there are villages where the number of inhabitants is in a continuing decrease, a situation which can put in uncertainty their future existence. As opposed to this situation, there are villages where a continuing increase of the population can be observed, a situation which can be explained by the fact that these rural settlements offer more and more improved social and economic conditions for the existence of human communities.

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THE ROMAN ROAD NETWORK. THE CAPITALIZATION OF AN OUTSTANDING PATRIMONY

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ABSTRACT. – The Roman Road Network. The Capitalization of an Outstanding Patrimony. It is our purpose here to present some opinions regarding a subject intensively publicized in the Western countries of Europe, but hardly known in Romania: Roman roads. The Roman road system is a very 'actual' topic, if we are allowed to use this term. In the last 20 years, the relation between Roman roads and tourism has rapidly developed, on two levels: 1. the importance of Roman road network in tourism; 2. the benefits of that tourism for the contemporary society. In Roman times, the communication system assured the economic development of the settlements, the propagation of the Roman civilization, the possibility to travel. Let's not forget that the unity of the Roman Empire was assured by the communication system, which was projected and then constructed beginning with the first century B.C. This project reached his maximum point during Trajan, when 80000 miles of Roman roads spanned all over the Empire. In fact, any town, any *villa rustica*, rural settlement, stone quarry etc. was connected to the road system. Beginning with Augustus, the emperors were extremely preoccupied with the construction of roads. They *fecit* or *refecit* numerous roads, because they understood that the political and administrative unity of the Empire could not be assured without roads. How important are Roman roads? How roads are perceived today in a geographical region, like Europe, where the main issue is to create a unified space, both political and economical? Why is it important to understand the impact and consequences of road construction in the Roman era? These are questions we will try to answer.

Keywords: *Roman roads, tourism, capitalization, management projects, resources.*

We sometimes feel today overwhelmed by the huge amount of information from various sources: internet, online books, TV, press etc. In this era of technology, though, important things that could be find out close to us, such as the archaeological resources, are present every day. TV channels, journals, DVDs, have a huge role in presenting some of the most important archaeological discoveries. Among them, one of the most fascinating subjects is related to Roman roads.

The Roman road system is a very 'actual' topic, if we are allowed to use this term. In the last 20 years, the relation between Roman roads and tourism has rapidly developed, on two levels: 1. the importance of Roman road network in tourism; 2. the benefits of that tourism for the contemporary society.

Archaeological tourism developed rapidly all over the world and became a huge business for many countries. We reached a certain level of consciousness regarding the patrimony. Contemporary societies became conscious that for a country, region, city or village the past represents an inestimable treasure. There are numerous exceptional sites in exceptional locations.

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Pompeii, for example, is the most fascinating location for all the archaeologists or researchers who had, as a main interest, the Roman era. Pompeii is visited annually by the large public. In the last 10-15 years, another Roman marvel became an attraction: the Roman roads.

As we have outlined before, the archaeological tourism constantly developed in many parts of the world (Himmelmann 1984). Numerous recently published books, articles and other studies present to the reader the concept of "landscape archaeology". In these contributions, the specialists inform the large public about the modalities in which the antique landscape was created and functioned in the Roman era, how the Romans understood to use this landscape, and which were the relations between the position of archaeological structures (legionary and auxiliary fortresses, cemeteries, Roman farms, stone quarries, roads, rural settlements) and the natural elements.

In Roman times, the communication system assured the economic development of the settlements, the propagation of the Roman civilization, the possibility to travel. Let's not forget that the unity of the Roman Empire was assured by the communication system, which was projected and then constructed beginning with the first century B.C. This project reached his maximum point during Trajan, when 80000 miles of Roman roads spanned all over the Empire. In fact, any town, any *villa rustica*, rural settlement, stone quarry etc. was connected to the road system.

Beginning with Augustus, the emperors were extremely preoccupied with the construction of roads. They *fecit* or *refecit* numerous roads, because they understood that the political and administrative unity of the Empire could not be assured without roads.

How important are Roman roads? How are roads perceived today in a geographical region, like Europe, where the main issue is to create a unified space, both political and economical? Why is it important to understand the impact and consequences of road construction in the Roman era? These are questions we will try to answer.

In 1999, dr. Ray Laurence, today professor at the Unversity of Kent, published an outstanding book: *The roads of Roman Italy. Mobility and cultural change*, Routledge Ed., London. In *Introduction* (p. 1-10), the author begins with a simple question: "Why write a book on Roman roads?". And he continues: "historians have recognized that the Roman state was involved in the development of an extensive transport network of roads from the fourth century BC, but have not manage to understand the impact of road building". Ray Laurence managed to investigate, from the economical and political perspective, the complex interaction of three elements: roads, cities and the geographical space of Italy. In the final chapter of his book, entitled *Space-Time in Roman Italy*, the author concludes that the unity of Roman Italy depended on its system of roads. The road was associated, in the Roman cultural landscapes, with the city or the villa. In this sense, the road network created a mechanism of Roman power.

Only when we understand completely that roads assured a geographical, economical and political unity for the Roman Empire, we will able to realize the importance of road network.

If we search on Google for "Roman roads" or "*viae romanae*" (or the correspondent in other languages – "strade romane", "Römische strassen", "vias romanas", "voies romaines" etc.), we discover a lot of information concerning this topic. In fact, the internet is a very useful tool in promoting this subject.

For example, when we search for "Roman roads", we find at "wikipedia" a short, but dense presentation of this subject: description of the terminology, laws, types of roads (*viae publicae*, *consulares*, *praetoriae* and *militares*; v*iae privatae, rusticae, glareae* and *agrariae*; *viae vicinales*), governance and financing, costs and civic responsibilities, official

bodies, Augustus' changes, other *curatores*, construction and engineering (practices and terminology, materials and methods – *via terrena*, *via glareata*, *via munita*, obstacle crossings, bridges and causeways), military and citizen utilization (milestones and markers, itinerary maps and charts, vehicles and transportation, way stations and traveler inns, post offices and services). Of course, there are links to other presentations, for example for milestones, or in the case of the subchapter concerning the construction and engineering, there is another link to the subject "Roman technology", "Roman engineering", "Roman military engineering", "Roman bridge".

The same kind of information can be found if we search on Google for "*voies romaines*". The difference is that in this case other images complete the text (Roman milestones and sectors of Roman roads from France, the Roman bridge from Alcantara etc). If we search for "*strade romane*" or "*Römische Strassen*" we can find, mainly, the same complete information.

It is impossible to write here about all these sites, but we only want to mention one or two, which contain useful information regarding Roman roads: http://www.traianvs.net, or http://www.viaeromanae.org.

The first is a very useful tool for specialists in Roman roads, Roman engineering and Roman aqueducts. This site is meant to be the European portal for Roman engineering: *Corpus Artium Munitorum Romanorum*. The main sections of the site are: "*Viae*", "*Pontes*", "*Metalla*", "*Ars Mensoria*", "*Administratio*", "*Aquae*", "*Saeptum Fluminum*", "*Portus*", "*Urbis*", "*Munimenta*" and "*Vias romanas*". Along with these, there is a section that contains other interesting on-line information, for example *Structuralia – Curso de Ingenieria Romana*. The site is edited and coordinated by Isaac Gallo Moreno, who is a well known specialist in Roman engineering. He published many articles and a book about the construction technique of the Roman roads: *Vías Romanas. Ingeniería y Técnica Constructiva*, Madrid, 2004. There are also presented other articles, pdf documents written by well known specialists. For example, an excellent book is the one published by Manuel Durán Fuentes, *La construcción de puentes romanos en Hispania*, Santiago de Compostela, 2005. In the section *Ars Mensoria* there are four intereseting articles concerning the Roman topography: *Roman surveying*, *Topografia romana*, *La dioptra, L'abaco*. Another interesting book related to the activity of Isaac Moreno Gallo is entitled *Elementos de Ingeniería Romana* (edited by Raúl Alba, Isaac Moreno and Ricardo Gabriel Martinez), published in 2004, as a result of an international congress (Congreso Europeo "Las Obras Públicas Romanas"), held between 3-6 November 2004 at Tarragona. The volume reunites some outstanding contributions on Roman bridges, aqueducts and mining engineering in Roman era, written by extremely well known researchers (Vittorio Galliazzo, Jean Claude Litaudon, Philippe Leveau etc).

The site http://www.viaeromanae.org presents the results of an international project (*Voies romaines en Méditerranée: création d'un réseau de partenaires et valorisation d'un patrimoine commun exceptionnel*), which concerned the presentation and description of the Roman roads from France, Spain, Italy, Greece and Portugal. Algeria and Tunisia were also associated to this project. I will quote from their own presentation: „*Les voies romaines constituent un important élément du patrimoine de la Méditerranée qui présente de nombreux atouts et un grand potentiel de développement, mais qui doit en permanence faire face à de nombreuses menaces, renforcées par l'absence actuelle d'une approche d'ensemble, concertée et opérationnelle dans une perspective de durabilité. Dans le but de rendre cohérente et effective à long terme la prise en compte et la valorisation de ce patrimoine, le projet vise à définir et à développer un schéma commun de valorisation, de sensibilisation et de mobilisation de la population et des pouvoirs publics autour de ce patrimoine, et vise également à agrandir et consolider le réseau des Voies Romaines en Méditerranée. Capofila: Association*

Regional Via Domitia Languedoc-Roussillon (France) Regioni Italiane partners: Lazio, Liguria, Umbria, Valle d'Aosta Paesi partners: Algeria, Grecia, Francia, Portogallo, Spagna, Tunisia". It is obvious that the project has an excellent idea and its purpose was the identification and capitalization of some important Roman roads.

A bibliography and other internet resources concerning Roman roads can be found at http://www.csun.edu/~hcfll004/viaeromanae.html. The bibliographical list is divided in several sections: Africa-Numidia-Mauretania, Iberia, Britannia, Galliae, Italia-Gallia Cisalpina-Alpes, Germanies, Balkans, Macedonia, Greece, Asia Minor, Syria, Palestina, Arabia, Egipt, *Tabula Imperii Romani*.

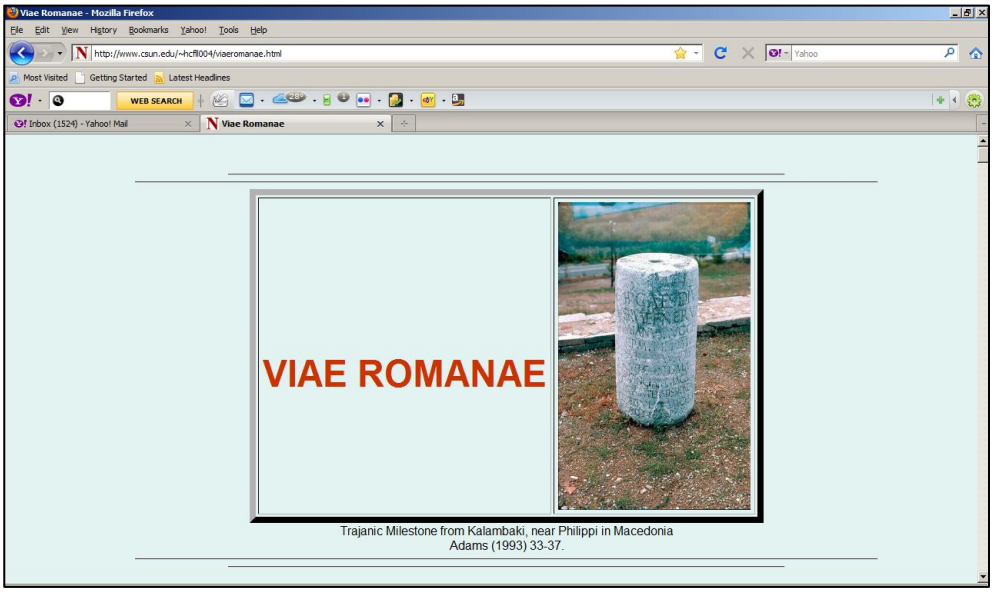

Fig. 1. First online page of the http://www.csun.edu/~hcfll004/viaeromanae.html.

These are, of course, only several internet resources concerning this subject. We can also find data about important related topics, such as *Tabula Peutingeriana*, Roman milestones, construction of Roman roads, *cursus publicus*, Roman vehicles and transportation, Roman topography and instruments, aerial photographs and Roman roads, GIS and Roman roads etc.

For example, the most complete antique document concerning Roman roads, distances and cities, is *Tabula Peutingeriana*. This *itinerarium pictum* is the subject of many sites, with information, description, images, interpretation etc. For an amateur, but also for a specialist, basic data concerning this document can be found on internet.

Another interesting resource for the capitalization of Roman objectives is represented by the contribution of BBC in realizing the series *What the Romans did for us*. There are six parts, presented on DVD-s by Adam Hart-Davis. The fourth part is dedicated to the *Arteries of the Empire.* Survey methods used by the Romans are presented. These enabled them to build straight roads. Hart-Davis also presents details regarding the ancient topographic instruments (groma, hodometer), the construction technique etc. This is an example of how this resource can be presented simple and efficiently to a wider audience.

In Italy, where the main Roman roads are known by their names (*viae publicae*), there is a real preoccupation for the concept of "valorizzare le strade". In Italy developed the concept of archaeological park (see for example the case of *Via Appia:* www.parcoappiaantica.org).

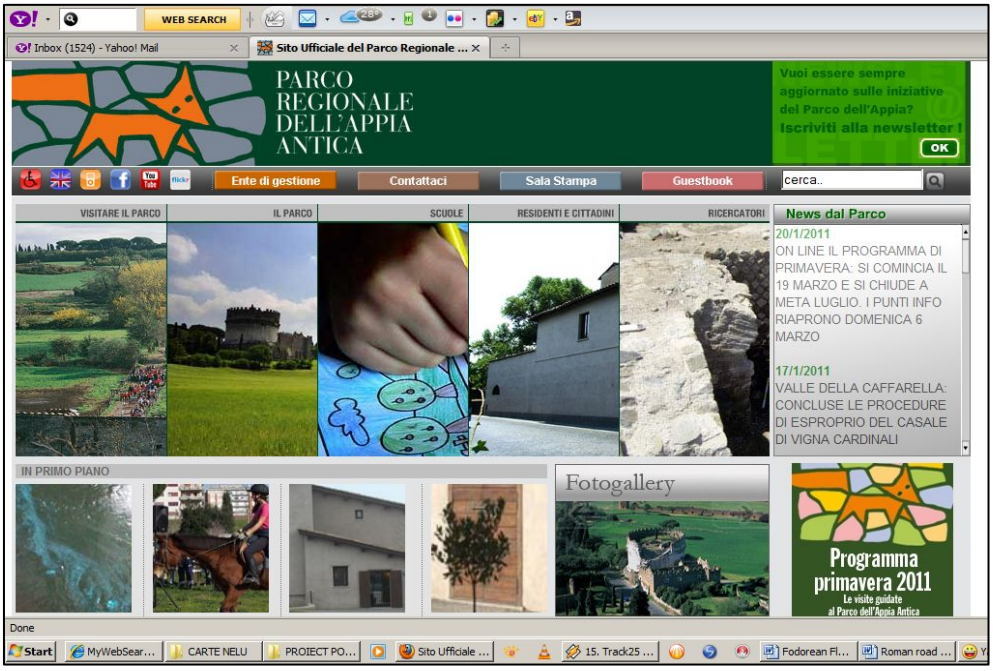

Fig. 2. First on line page of www.parcoappiaantica.org.

Other resources concerning roads are museums (in Rome the Museum of Via Ostiense: www.archeologia.beniculturali.it/pages/atlante/S68.html), projects such as "Dal monte al mare sull'antica Salaria" (www.musei-salaria.it), projects for 3D reconstruction, such as "Immaginare Roma Antica" (www.appia.itabc.cnr.it), international projects for the valorization of certain Roman roads (for example *Via Claudia*: www.viaclaudia.org and www.claudia-augusta.net/it).

Another way to present the Roman roads is the publications of archaeological guides. In J. H. Farnum's book, *Guide romain de la Suisse*, Payot, Paris, 1975, there is a short presentation concerning a sector of a Roman road in Rupperswil, in the North of Switzerland. The text is very precise and offers essential information: "Du centre de Rupperswil, revenir vers l'ouest par la route menant à Aarau. Au bout de 2 km à peine, on voit sur le côté droit de la route une usine électrique. Aussitôt après cette usine, prendre un chemin qui part à angle droit. Quelque 100 m plus loin, cette route croise la voie romaine". A clear example of what we should know in order to visit a Roman road.

These are the facts. This huge resource is close to us, we can discover it everywhere. If we are conscious of the importance of the Roman roads, we can understand the past. We can understand how Romans successfully managed to control such an enormous territory.

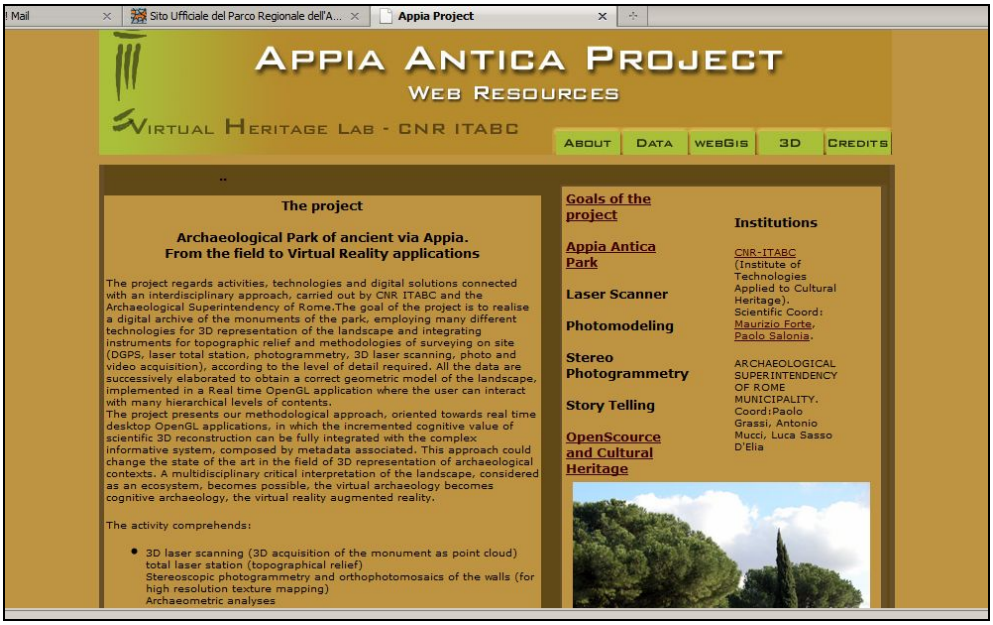

Fig. 3. First online page of www.appia.itabc.cnr.it.

We can learn to respect these remains and to reflect upon the effort made for building them. We can, at least, copy this example: with *labor* and *disciplina*, Romans managed to conquer, organize, administrate and exploit such a huge territory. We should look closely and learn from it. It is an example for us, for our predecessors and for the future generations.

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BRAŞOV INTERNATIONAL AIRPORT PROJECT – RISKS AND OPPORTUNITIES

CS. MÁTHÉ[1]

ABSTRACT. – Braşov International Airport Project – Risks and Opportunities. This paper aims to evaluate from a geographical point of view the impact of the planned airport to the Romanian air transport system. As every project has strengths and weaknesses, in this paper I tried to highlight those aspects that could be fundamental for the new airport operation. The success of a transport infrastructure facility depends on the relationship between transport demands (requested by the population and economy) and the transport capacity (supply). As transport demand is hard to be predicted we are forced to evaluate some aspects of the social and economic system of the territory. Braşov metropolitan area has around 400,000 inhabitants, a thriving economy and also an outstanding tourist potential which are the strengths of this project. On the other hand, the proximity of Braşov to the capital, which is the most important location in the Romanian air transportation system, could cause a problem. Also hard competition can be expected from Sibiu and Targu Mureş airports as well. The key issue in the success of Braşov airport will be probably the quality and amount of services and the number of international destinations provided. In this point of view the airport management will be crucial.

Keywords: *airport traffic, service area, proximity, "low cost" airlines.*

1. INTRODUCTION

The most important advantages of air transport are the speed of movements (short travel time) and the radius of operation. The biggest drawback of air transport is the higher cost regarding the proportion of tons and kilometers than in the case of terrestrial transport, therefore air transport focuses primarily on the transport of passengers and valuable goods (Withe H. P., 1983). The other important advantage of the air transport network is that there is no need for linear transport infrastructure linking airports, which gives a relatively big freedom in the flight planning procedure. The three basic components of the air transport system are aircrafts, airports and air routes. Airports are special infrastructure elements, where interchanges between different transport networks are taking place. The airport is a complex ensemble that serves air transport and is divided into three categories: aerodrome, airport and technical dependencies (Turbuți Gh., 1978).

At this moment Romania has 16 public airport facilities, out of which 15 are functional. Analysing statistical data for the last ten years, we can conclude that air transport sector is in a powerful development process. The number of passengers carried, as well as the number of airplane movements, has reported higher values from year to year. Traffic data for 2010 correlated to 1999 shows an outstanding 438% growth, reaching the ever highest value – 10.1 million passengers. With these numbers, air transport remains still the third major transport facility, but the emergence of this type of transport is imminent, and in the case of international relations its importance is even higher than rail transport.

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After 1989, and especially following Romania's accession to the European Union, the liberalization of national borders took place. International connections became important with increasing number of Romanians working abroad.

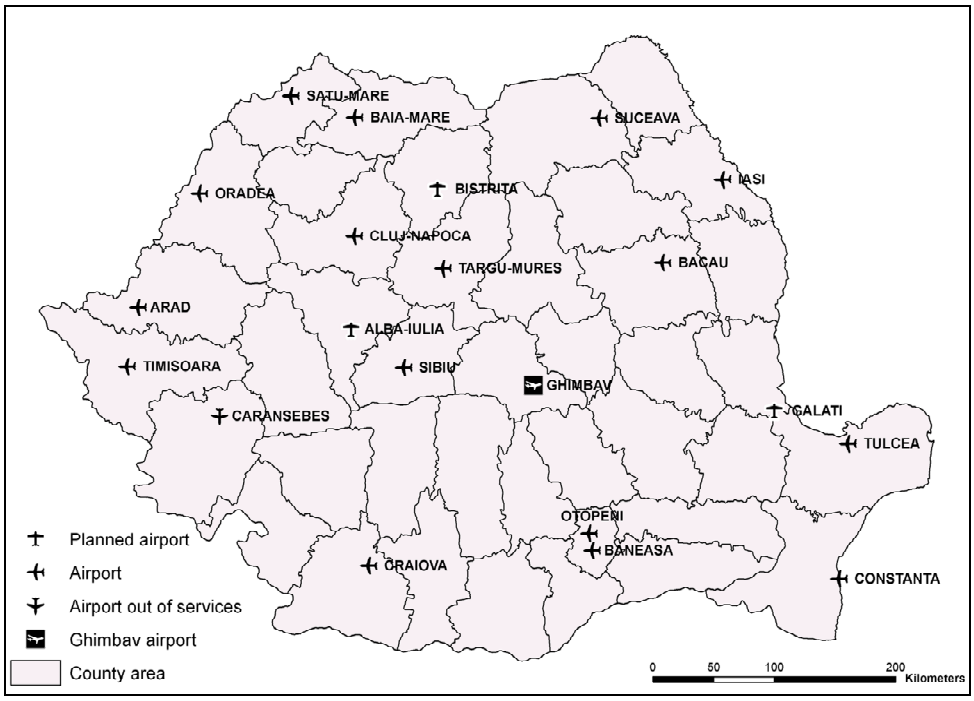

Fig. 1. The locations of Romanian airports by category, own edit.

Short after integration "low cost" airlines entered the Romanian market, providing a large range of European destinations for reasonable prices. This generated the increase of the number of transported passengers especially in the case of regional airports like Cluj-Napoca and Timişoara.

2. SHORT HISTORY OF BRAŞOV INTERNATIONAL AIRPORT PROJECT

Although aircraft industry has notable tradition in the surroundings of Braşov, we must still wait for the opening of the first public airport. Between the two world wars, aircraft engines, aircraft based on licenses, Romanian engineered propellers and aircraft accessories were built at IAR Braşov plant. The plant was established in 1927 and until 1944 eight types of aircrafts were manufactured here under license with other 17 Romanian aircrafts (Pop Gr. P., 1984). Other notable works in aircraft industry were Forja-Poldy Braşov and Întreprinderea Laminoarele Românești de Metale (Balotescu N., 1984).

The idea of constructing an airport at Braşov (Ghimbav) had generated discussions about the viability of the project. Those who opposed the project generally argued with the city's

geographical position, considering that after the finalization of the motorway development program Braşov will have very good road connections to the nearest airports, and especially to Bucharest. It is a fact that several airports are under the radius of 200 km, which takes about one hour and a half via motorway. But this is only one side of the coin. Those who supported the project argued with the importance of Braşov, its role and position in south-eastern Transylvania social and economical system. Besides, Braşov has a remarkable tourism potential; the city closest surroundings are abundant in spectacular landscapes, and possess an outstanding cultural heritage as well.

The airport issue first arose in 1993, but a study realized by Danish experts had emphasized that the project could not be justified economically, and it was hard to imagine that the County Council will find investors. The current project was initiated in 2006 and is carried out by Braşov County Council. At the beginning of the new project an important role had a foreign citizen who left 45 years ago for Canada and in the meantime became president of Intelcan Technosystems Inc. His engagement into the building of an international airport in Braşov has proved to be a determinant factor. Shortly afterwards the official partnership was announced between Braşov County Council and the Canadian company. For the beginning of the construction it was mandatory to clarify the ownership of the land parcel where the airport was designed to be built. The territory at that time was state property and the land transfer needed political decision.

From the government and particularly from the Ministry of Transport, the airport received moderate support and even Braşov City Council has shown different attitude in recent years in this topic. Actually the airport project became a subject of political debate between two major parties in Romania, PSD and PD-L. Since 2004 PD-L is the governing power, which generated an unfavorable condition for the project's developing process. All these things together caused that the Parliament has adopted the Government Decree no. 41/2007 only on the 12th of May 2009, by which the state has passed the territory of the future airport to Braşov County Council. After the decree was signed by president Traian Băsescu the land issue (200 ha) was finally solved. But the problems were not over! When everybody thought that finally the project is heading into the right direction the global financial crisis emerged. Intelcan did not manage to obtain bank loans for the construction and that lead to the termination of the contract.

Finally, Braşov County Council reached an agreement with ERSTE bank regarding the 60 million Euro loan needed for the airport project. Compared to the original version of the project, the airport size and costs were reduced by 30%, which was a requirement to obtain financing. The possibility of further development of the airport remains open. Regarding the initial plans the total surface of the airport covered around 220-270 hectares, from which the terminal itself an area of 10.000 m^2. The estimated capacity of the airport was around 1 million passengers per year, with the possibility of being extended in a modular way to reach the capacity of two million passengers per year. The traffic of goods was estimated to reach about 60,000 tonnes/year, increasing to as much as 200,000 tonnes/year. The airport was projected to have a maximum flow of 400-500 passengers per hour. According to the initial plan the airport would have over 800 parking places: 50 places for VIPs and 750 regular places for passengers and the persons accompanying them (Brăiescu Gh., 2007).

The revised airport project retains the size of the runway. The 2,800 meter long runway will be able to handle medium-sized aircrafts such as Boeing 737 and Airbus 320 series, furthermore the airport will be supplied with special infrastructure that will allow the airport's full time function.

Braşov County Council launched the official tender for constructing the runway and the terminal by public - private partnership which represents an important milestone. The estimated value of the contract is around 85 million Euros. An interesting thing is that Cluj-Napoca Airport participates in this tender in consortium with UTI Instal, a company that performed the upgrading works of the Cluj airport[2].

Two studies were performed to estimate the traffic. One of them is taking into consideration about one million passengers per year, the other one expects that the airport turnover will be around 500,000 passengers (this study was performed during the economic crisis), but even in such a condition the airport profitability is assured.

3. STRENGTHS AND OPPORTUNITIES

Because of the special properties of the air transport system, the airports are generally constructed near major cities or in their immediate vicinity. Since air transport is competitive in middle and long term trips, the frequency of usage of this type of transport is lower than in the case of other transport modes allowing shorter distance traveling. Based on these aspects the most important criteria in airport planning are the size of the potentially interested population and the general standard of living (economic power).

An important strength of Braşov Airport project is that it will serve directly a region with high population density. In 2005, Braşov Metropolitan Area was established, having the role to ensure a coherent and coordinated framework for the development of the urban area of Braşov. Braşov and the other 13 municipalities surrounding it form together an urban-rural territory of 406,250 inhabitants (according to Braşov Metropolitan Agency for Sustainable Development). It is important to notice that 89% of the total population of the metropolitan area is given by Braşov and the other five cities. Analyzing the distribution of population on the 1st of January 2009, the urban ranking is the following: Braşov (278,048), Săcele (32,356), Codlea (24,644), Râşnov (16,277), Ghimbav (5,438) and Predeal (5,223).

Due to the regional settlement structure, the new airport at Ghimbav will have around 557,600 inhabitants within the range of 30 minute driving time, which is far above than Sibiu and Târgu Mureş airports similar results. This area of influence includes the southern part of the neighbouring Covasna County with its county seat, Sfântu Gheorghe (61,799 inhabitants), along with other settlements of Braşov County, of which the major settlement is Zărneşti with 25,780 inhabitants. It is clear that more than half a million inhabitants live in the immediate vicinity of the new airport, which is undoubtedly an important safeguard for this project in the forthcoming air transport competition.

Another important aspect of the airport's future exploitation is the region's present economic power, and forthcoming economic development perspectives. A detailed analysis of the living standards cannot be performed in this paper, so the estimation regarding Braşov County economic development level is realized based on a county-level GDP data. Braşov County GDP data for the past 15 years showed an exponentially growing tendency. Compared to the level achieved in 1995, the county GDP has reached 16,822.9 million RON in 2008, which represent a 60-fold growth rate. At national level Braşov County is among the most developed counties. According to the registered GDP in 2008, it was on the 7th position out of 42 counties and on the 6th place when it comes to GDP/inhabitant. The GDP/capita in 2008

[2] http://www.citynews.ro/cluj/, 07. June 2011.

(28,186 RON/capita) has exceeded the Centre Development Region average value as well as the national one. In Transylvania, Braşov County is the second most developed in terms of economic performance after Cluj County. Based on statistical data for 2008, 20.287 active businesses were reported in Braşov County (out of which 62 companies which had more than 500 employees), which meant the fifth position nationwide after Bucureşti, Cluj, Timişoara and Constanţa counties. Beside economic indicators, it is important to emphasize that Braşov as the seventh largest city in Romania it is an important educational, cultural and healthcare center for Southeastern Transylvania, offering a wide range of services.

The third major strength of the airport project is the tourist attractiveness of the area. The tourism potential of the region resides in the mixture of spectacular landscape features with the richness of medieval cultural heritage. The Black Church within the ancient city centre of Braşov, alongside the medieval fortified Saxon churches in the surrounding villages are the most popular tourist destinations. The city could be considered an ideal starting point for the exploration of the surrounding Carpathians Mountains, especially Bucegi and Piatra Craiului which offer great hiking trails and a variety of scenery places to visit as well. In addition, every year a series of cultural events and festivals are hosted in Braşov, including the famous "Golden Stag" music festival.

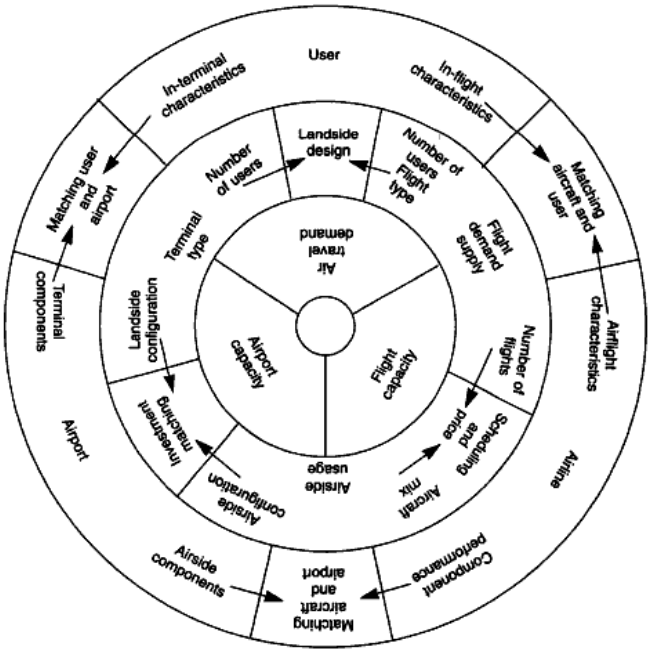

Fig. 2. A hierarchical system diagram of airport relationships (Ashford et al, 1998).

Braşov County is one of the most visited region by tourists in Romania. There are several resorts equipped with well developed tourist infrastructure, in many cases including proper infrastructure designed for winter sport activities, making the countryside attractive in all seasons. The most famous resorts are Poiana Braşov, located at 12 km West from Braşov and Predeal at 27 km to the South. Other places and tourist attractions of the county are located in Bran (Bran Castle), Moeciu (unique mountain landscape), Râşnov, Făgăraş, Prejmer and Zărneşti.

The tourist accommodation capacity of Braşov County has undergone a spectacular development over the past decade, with an increase of more than 6,000 new beds, and a 53% increase in the number of tourist accommodation facilities as well. Also an increase in the number of visitor nights was recorded, which is the key indicator in tourism and travel. We can summarize that tourism in Braşov County is developing in a spectacular manner.

One of the basic requirements in the exploitation of tourism potential is the adequate accessibility. For foreign visitors, the accessibility of the fast and convenient travel possibilities consist an important requirement. Therefore, the possibility of flying could become easily the most important factor in decision-making regarding the tourist destination. In 2010, at national level 16% of the incoming tourists used air transport for traveling, making this type of transport the second preference after road transport.

Tourist accommodation facilities, their capacity, and occupancy in Braşov County

Table 1

Year	2000	2005	2006	2007	2008	2009	2010
Total number of tourist accommodation facilities	308	403	489	471	493	482	474
Total beds in tourist accommodations	10549	12037	13883	12634	15729	14728	16742
Total nights spent (thousand)	*709*	*794*	*1055*	*1191*	*1280*	*985*	*1078*
Number of hotels	38	42	52	50	57	60	65
Beds in hotels	5374	4672	5505	5449	5740	6128	6652
Nights spent hotels (thousand)	*548*	*479*	*653*	*709*	*724*	*571*	*641*

Source: National Institute of Statistics, Tempo – database, edited.

Air traffic in Romania has showed a spectacular growing rate in the last ten years, reporting a 488% increase in passenger traffic compared to 1995, and has exceeded for the first time the 10 million carried passenger barrier in 2010. At international level however, with a ratio of 37.4 travellers / 100 inhabitants, Romania lays far behind the Western European countries and even Central European countries, managing to overtake only Slovakia.

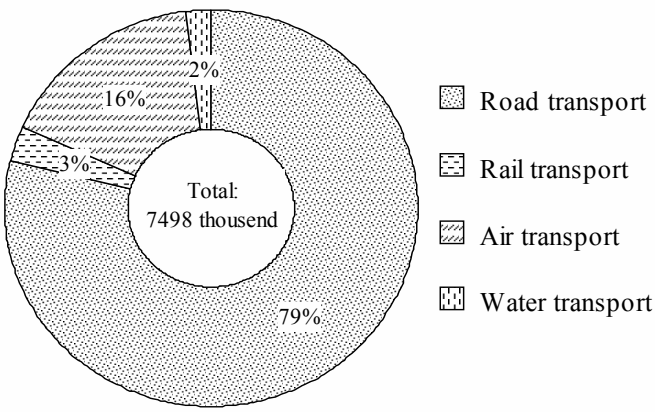

Fig. 3. Foreign tourist incomings in Romania by travel mode, in 2010.

Source: National Institute of Statistics, edited.

The new airport offers many new opportunities. It is expected to influence directly the tourism, and the strengthening of foreign relationships and thereupon the foreign direct investments as well. In the globalizing world economy, the quick accessibility provided by air transport facilities could prove to be the key issue in the selection of new industrial sites. The new airport will boost tourism as well, especially one may expect the intensification of the 1-3 day long "city-break" style tourist activities. It is important to mention that the new airport can play a major role in the regional tourism marketing as well. We can assume that positive

feedback mechanisms will develop between the airport and its area of influence. The quick accessibility provided by air transport presumably will boost the economic performance on one hand, but on the other hand the stable economic background is the key factor of the airport's future functionality. In addition, a higher living standard is expected to generate the increase of the air traffic.

4. RISKS

The most serious risk factor in the case of this airport project is the expected high competition on the air transport market resulting from the spatial location of the new airport. Practically, the firmest standpoint for those who oppose the necessity of this project is based on this location issue. Braşov lies at the crossroads of several major routes and therefore is playing an important "gateway" role in the communication between Transylvania and the outer Carpathian regions (and mainly Bucureşti). For this reason, several major transport infrastructure elements coming from different directions like the E60, E68, E574, DN 14 roads and three main railway lines converge. Braşov accessibility by public transport is also above average. The most important center and junction of the Romanian transport network is the capital, so Braşov - Bucharest axis is already established and further developments are planned. Of these projects, the most important ones are the Bucharest – Braşov motorway (planned inauguration in 2014) and the modernization of the 300 railway line in order to reach speeds up to 160 km/h.

The capital's relative proximity could be a serious limiting factor, amplified even more by the fact that both airports are located North of Bucharest, so one coming from Braşov does not have to deal with Bucharest traffic at all. Travel from Braşov to Bucharest (161 km) currently needs around two and a half hours by car and around three hours by rail. After the finalization of the national infrastructure development program, the time based accessibility of major cities will improve significantly, so Braşov – Bucharest route will need only one hour and a half by road and one hour and a quarter by rail. Braşov - Bucharest midpoint (on the main road, DN 1) is located near Câmpina, so several small sized towns in Prahova County are located closer to Braşov: Azuga, Buşteni, Sinaia, Comarnic and Câmpina. The delineation of the airport attraction area based only on the network distance between them is unlikely. It is hard to believe that Braşov will be able to roll back the attraction area of Bucureşti.

Similarly, competition regarding attraction area changes will take place in the case of Sibiu and Târgu Mureş airports too. It is important to mention that the new airport will cause the rollback of the two mentioned airport attraction area delineated by 60-120 minutes travel time. The collision point of the catchment area in the case of Braşov - Sibiu route (144 km, on E68 road) is located near Voila, while in the case of Braşov - Târgu Mureş relations (171 km, on E60 road) between Buneşti and Saschiz. Currently, the entire Harghita County and the northern part of Covasna County belong to Târgu Mureş Airport catchment area. After the new airport will become operational, the south-eastern part of Harghita County until Sândominic village as well as Covasna County entirely will be transferred to Ghimbav airport catchment area. In the case of Sibiu airport, the city of Făgăraş will become part of Ghimbav airport catchment area, but several villages and Victoria town in Braşov County will remain closer to Sibiu airport based on network distance.

The road network development plan includes Sibiu - Făgăraş express road which will link Cluj – Târgu Mureş - Braşov highway (A3 motorway) with the A1 motorway. In the near future, first-class road links will be built between Transylvanian airports, which will represent a

favorable situation from the point of view of the population, but rather a challenge for Ghimbav airport. For the moment, there are relatively small network distances between the Transylvanian airports (maximal distance is on the Ghimbav – Cluj route, 264 km) and the time based accessibility of all four airports will be improved in the near future due to the motorway construction program. For this reason, the spatial location of the new airport cannot guarantee a clear positional advantage. The two Bucharest airports have without doubt a huge advantage regarding competitiveness as a result of the two million inhabitants with the highest average standard of living in Romania, and the economic, political and administrative status belonging to the country capital.

According to statistical data, in 2010 the air passenger traffic has exceeded 10 million passengers of which 69.2% were carried out by the two Bucharest airports, 11.4% by Timişoara and 10.8% by Cluj-Napoca airports (all of these together share 91.4%!). As a consequence of this situation we can expect that a tough competition between the Transylvanian four airports will arise. For the moment, the main airport in Transylvania is beyond all questions Cluj-Napoca with more than 1 million passengers in 2010, twice as much as Sibiu and Târgu Mureş airport turnovers together.

Cluj-Napoca airport is unequivocally aiming to regional domination and the only serious challenger in this pursuit could gradually become Ghimbav airport, therefore a competition between the two airports is to be expected. Another interesting sequel according to press releases is the fact that the company operating Cluj-Napoca airport (as part of a consortium) is taking part at the competitive bidding released for Ghimbav airport administration. In my opinion, it is not justified by any means, that one company closely related to the biggest rival could become the administrator of Ghimbav airport.

The crucial factor in the success of the new airport will be more likely the efficiency of the airport management. We must admit that, besides location issues, the most important attraction force of the airport comes from the destinations offered by it, and therefore this is a powerful limiting factor in airport choosing. If the required travel destination is available through several airports located at nearly the same distance, some other topics such as travel fare, airport accessibility by travel means, and the quality of services provided by the airport could play an important role in the decision making. For regional airports, the cooperation with "low cost" airline companies is a priority. This type of collaboration opens the opportunity for airports to establish a wide number of travel destinations (widening the airport supply) and ensure low ticket fees at the same time. The particular characteristics of "low cost" airlines are their profit-based policy and their high mobility regarding the operated airports (Wizz Air is a concluding example for this), therefore the presence of traditional airlines brings much more stability to airports. On the other hand, large airlines mostly operate flights between country capitals and the major air transport hubs, so a mixture of the two types of airlines is ideal for a particular airport.

5. CONCLUSIONS

The aviation sector in Romania had a rapidly developing trend in the past decade, and it is expected that this process will continue in the future. During the past 50 years a multi airport model based air transport system has been developed in Romania, and the running national development strategy (PATN) takes into consideration four additional airports as well. Among the planned airports, only the airport near Braşov will be built within a reasonable time. The remaining three airport projects have little chances to become reality.

Due to its spatial location, the new airport at Ghimbav will provide air transportation facility for more than half a million inhabitants living in its attraction area. Due to the proximity of several airports (including the two Bucharest airports), the new airport will probably face a fierce competition on the air transportation market. The planned nationwide infrastructure development program will increase the accessibility of the airport and this will further strengthen the competition among airports.

The strong points of Ghimbav airport project include the high number of inhabitants living in its attraction area, the economic development level of Braşov County, the remarkable tourism potential of the region and finally the position of Braşov in the national settlement hierarchy. According to the national development concept Braşov is considered a national Growth Centre, where economic development is expected to boost also the economy of its surrounding areas.

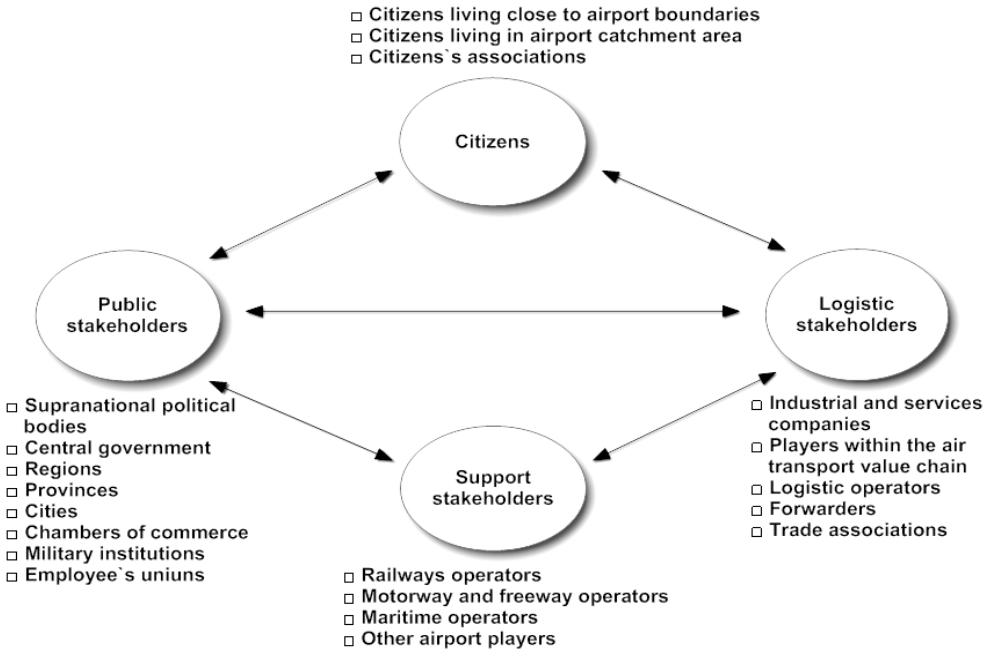

Fig. 4. The stakeholders in airport business, after Jarach, 2005.

The major challenge for the new project will be without any doubt the management of the new airport. By a successful management, the weaknesses of the project could be diminished and the consolidation of the attraction area can be achieved. In the first stage of activity, the attraction of the airlines is crucial, and beyond this the "low cost" airlines involvement will be important. Special attention should be paid to the airport marketing activities, and to the relationships built with tourist agencies and ticketing agents as well.

The competitiveness of the airport could be improved by providing different additional services like car rental, airport shuttle service, restaurant, money exchange facilities, free internet

connection (wifi), information desk, VIP lounge, duty free and so on. The accessibility of the airport is a highly important issue - it would be recommended to provide full time public transport service (24h) between the airport and Braşov downtown, as well as to apply a friendly parking fee policy. Applying low parking fees, or even free parking slots under certain conditions, could be an efficient tool to attract distant travellers who are willing to use their cars to get to the airport.

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STUDIA UBB GEOGRAPHIA, LVII, 1, 2012, pp. 191-198

SPATIAL LOCATION AND DYNAMICS OF RETAIL STORES IN CLUJ-NAPOCA CITY CENTER

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ABSTRACT. – Spatial Location and Dynamics of Retail Stores in Cluj-Napoca City Center. The decisions regarding the location of retail stores have a decisive impact on the structure of the central area of a city, as the retail segment has the main role in generating the phenomenon of centrality. This paper identifies and analyzes the retail stores and their location in Cluj-Napoca city center, as well as their spatial behavior. It is based on detailed surveys of the buildings located in the city center. The data recorded in the field were later introduced in ArcGIS 9.3 program, as it allows multiple spatial interrogations. Within the studied area, one may notice that the stores selling a large number and diversified products for medium and long duration take advantage of the spatial proximity, according to the principle of complementarity. Spatial concentration of retail stores may be noticed near bus stops or around the road junctions. However, concentration may also be a restrictive factor as it leads to competition; therefore, certain stores, like the groceries, are rather spatially dispersed. After 2007, an accelerated reorientation of the retail segment took place in Cluj-Napoca, as two large shopping centers – Polus Center and Iulius Mall – opened up at the periphery of the city. Trade in the central area suffered a severe decline so that many stores relocated in the large shopping centers. The financial crisis also led to significant mutations in the field of commercial services. The predominance of the social class with average and low income made that the empty spaces left by the widely-known brands in the city center to be taken by second-hand shops, cheap clothing stores and pawn shops. The study succeeded to overcome the simple inventory of central functions, getting to notice trends, to identify laws and explain spatial behaviors that became typical in the case of certain functions and retail stores.

Keywords: *retail stores, spatial location, city center, shopping centers, trade, crisis.*

1. INTRODUCTION

The cities of Central and Eastern Europe underwent deep changes, related mainly to the decline and fall of the socialist or communist regimes (P. Korcelli, 1997) and the shift towards the market economy. Therefore, a new period of urban development started, in which western influences occurred gradually and became more and more important and visible in territories that have a peculiar historical background. New structures appear, providing the framework for interesting research opportunities, unavailable before.

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This paper aims at identifying and analyzing the retail stores and their location in the central area of Cluj-Napoca city, as well as their evolution according to present urban processes, in order to assess postsocialist changes. The main objective is to identify the general principles which guide the central retail stores in organizing their spatial behaviour. This study also aims at asssessing the functions of the central area of Cluj-Napoca City and establishing the locational trends within the city.

2. RESEARCH METHODOLOGY

The paper is based on detailed surveys of the buildings, which included both functional and physiognomic characteristics, in order to provide a better processing. The cartographic support used during the surveys consisted of a dwg map type, executed according to topographical measurements. Based on it, in the stage previous to field work, the central area of the city has been approximately delineated and the buildings were digitized. During the surveys, the decrease in number of the central functions led to the eventual delineation of the area of analysis.

The data recorded in the field were later introduced in ArcGIS 9.3 programme. In order to make the future processing easier, we opted to categorize the functions into large classes according to frequency analyses. Therefore, the main tool for the assessment was ArcGIS, which allowed multiple spatial interrogations and analyses aiming at representing, highlighting and interpreting the spatial "behavior" of central functions.

3. THE RETAIL FUNCTION OF THE CITY CENTER

The totality of businesses that are concentrated in the center and sell goods directly to the consumer in order to satisfy its different needs represents the retail function of the center (H. Heineberg, 2006).

In order to find spatial concentrations of diverse functions, surveys have been made to see the uses of each building. This way, the trade axes are the first to be highlighted. They provide continuous linear concentrations and represent the most intense uses within the center.

Location is the determining factor in the success or failure of a retail store because the main purpose of the business is to maximimize the volume of sales. Therefore, it should be located in such a way as to attract the potential customers. Consequently, the locational criteria of such a store are: short distance from the customers, pedestrian traffic, favorable image of the place, nice aspect of the building, accessibility to public transport and renting availability (E. Kulke, 2009).

Analyzing the locational trends of retail units, one can easily notice several important peculiarities. The retail units included in the 1st necessity class have the tendency to be set up in locations with high accessibility (G. Heinritz *et al*, 2003). They mostly prefer the trade axes (leather and jewelry shops). However, the important car dealers prefer mainly the locations outside the city center, along the roads with high accessibility for individual means of transportation.

The retail units of the 2nd necessity class also like the most central locations. This is true especially for specialized stores, for clothes and shoes. Although some of them do not provide high quality products, they are successful due to the high number of passers-by and therefore clients.

The retail units of the 3rd class need a very high frequency of customers and significant profits in order to support their existence. As a result, they tend to locate in places with a high

concentration of dwellings, in order to satisfy the basic needs of the inhabitants. However, they also make partially profit from the high number of passers-by in the central area of the city (proximity stores).

Fig. 1. Spatial distribution of grocery stores.

Another important indicator is the commercial space which, together with the size of the commodities, provides an important classification of retail stores. Taking into account the size of the commodities, the following categories may be differentiated (H. Heineberg, 2006):

- Retail stores with wide commodities, but limited in depth: mixed retail store;
- Retail stores with wide and deep commodities: the large shopping centers;
- Retail stores with an average width and depth of the commodities: clothing and grocery stores;
- Retail stores with narrow but deep commodities: specialized retail stores (winery, hat shop);
- Retail stores with narrow commodities and limited in depth: kiosks, moving units which do not have a fixed location.

Within the studied area, one may notice that the stores selling a large number and diversified products for medium and long duration take advantage of the spatial proximity. They choose their location according to the principle of complementarity. In this manner, one may explain the immediate closeness of numerous clothing stores. The concentration of such retail stores is most obvious where a bus stop, the railway station or a road junction increase the number of passers-by. Spatial proximity may however restrictive factor due to the competition, especially in the case of specialized retail stores (E. Kulke, 1998).

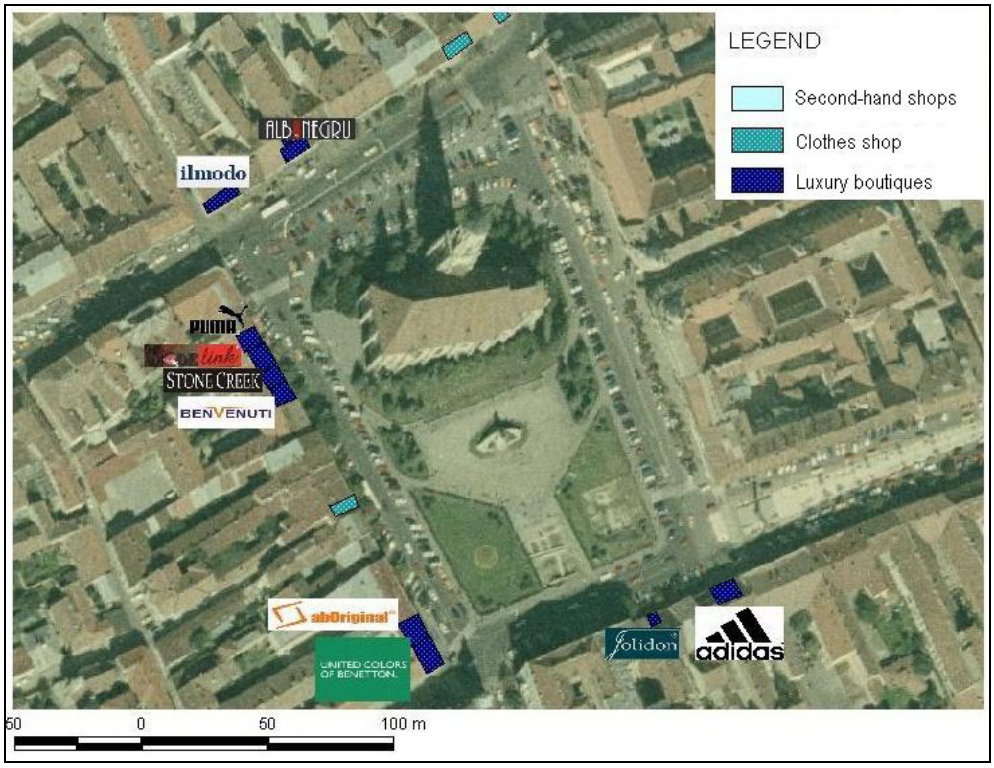

Fig. 2. Luxury stores in Unirii Square – 2007.

Therefore, one may notice a network of dispersed grocery stores. Concentrations are remarked only in the case of specialized stores with narrow and deep commodities: butcher shop, dairy store, bakery. A significant example in this sense is Mihai Viteazu Market, where the higher concentration of residential buildings determined the presence of numerous proximity stores.

Apart from these factors, there are also individual choices, which have their impact on the locational trends and are specific mostly for the small retail stores. The personal preferences of the manager, usually the proximity to its own residence, may play an important role in these cases.

4. DYNAMICS OF RETAILING

Although commercial services seem to be well represented in the central area of Cluj-Napoca, a more detailed analysis will indicate the weak representation of top central segments (luxury stores, jewelry shops). The retail segment is characterized by an increasing demand for cheap and diverse products.

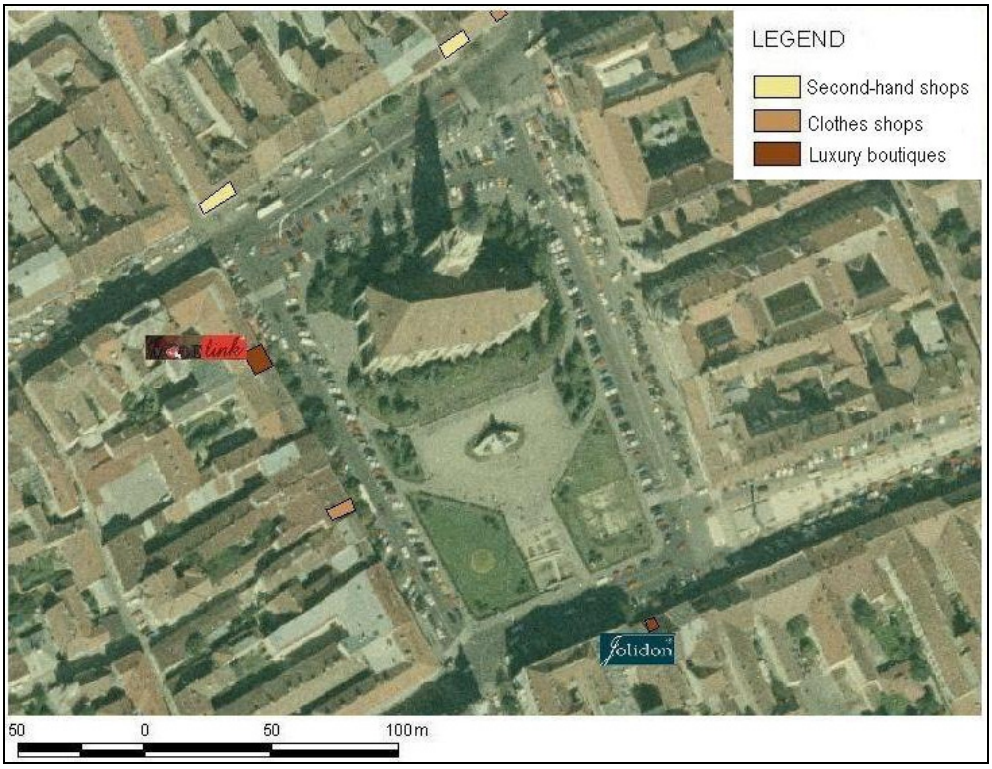

Fig. 3. Luxury stores in Unirii Square – 2010.

Huge stores, the principle of self-service, the wide commodities and relatively small prices became the slogan of new commercial structures. Because of the high spatial consumption, their location in the center became almost impossible. Therefore, this type of stores started to look for peripheral locations, that are usually cheaper, so a "Westernalization" of commerce (J. Stadelbauer, 1994) became inevitable.

In 2007, an accelerated reorientation of the retail segment took place in Cluj-Napoca. Two large shopping centers – Polus Center and Iulius Mall – added to the numerous already existing supermarkets.

The apparently unsaturated demand, the good accessibility by personal car, the generous supply of parking lots, but also the advantages provided by the concentration of several services determined an increasing attractiveness of these locations. Nevertheless, due to this, the trade in the central area suffered a severe decline so that many stores were and are threatened by

bankruptcy. Especially the top central segments (luxury shops, jewelry stores) are noticed to relocate at the periphery, in the large shopping centers. In this manner, relations of competition have developed between the central and peripheral areas of the city. In the case of Cluj-Napoca, this rivalry was unfavorable to the center.

Immediately after their opening, the two shopping centers became a target for the luxury stores previously located in the center. Famous brands like Leonardo, Kenvelo, Liu JO, Adidas, Puma, Stone Creek, Wink or Il Modo did not give much thought before deciding to move out from the center (O. Cornea, 2008).

However, customers also joined the important brands, so that Polus Center and Iulius Mall also generated a migration of the clients from the center to the two shopping centers (C. Dan, 2010).

5. ECONOMIC CRISIS AND THE RETAIL SECTOR

The present state of the retail sector is deeply affected by the unsatisfactory financial situation of the population. The financial crisis led to significant mutations in the field of commercial services.

Fig. 4. Spatial distribution of second-hand shops and pawn shops.

The predominance of the social class with average and low income made that the empty spaces left by the widely-known brands to be taken by second-hand stores, clothing stores selling „everything for 10-12 RON" and pawn shops, while higher quality services seem to stagnate.

Although the second-hand shops are strongly affected by the currency exchange ratio oscillations, as they buy the products abroad and the provision of merchandise is sometimes controversial, this type of trade proves to be lucrative in times of crisis (S. Staiculescu, 2009).

The pawn shops proved to be another profitable bunsiness in times of economic crisis. While many other services are no longer viable in the central part of the city, pawn shops recorded an increasing number of customers. The capacity to adapt to the present demands of the customers allowed even supplementary benefits. Therefore, the pawn offices that succeeded to change their profile, pawning not just gold and silver jewelry, but also electronic devices, mobile phones and even computers, make excellent profit even during this difficult period (Elza Almaşi, 2009).

Where the unfavourable economic conditions went together with the decentralization trends of the stores, empty buildings started to show off. Nevertheless, the dynamics and heterogeneity of the structures in the central area provide a high degree of adaptability. Therefore, new processes develop continuously and "for rent" advertisements do not remain for long in the windows of the buildings.

6. CONCLUSIONS

The decisions regarding the location of retail stores have a decisive impact on the structure of the central area, as the retail segment has the main role in generating the phenomenon of centrality. This idea is also reflected in the statement: "Retail stores no longer need the central area, nevertheless the central area needs them" (G. Heinritz *et al*, 2003).

The study succeeded to overcome the simple inventory of central functions, getting to notice trends, to identify laws and explain spatial behaviors that became typical in the case of certain functions and retail stores.

Both the database created during the field work and the outcome of the analysis are important and may be used and applied in various fields. The study may provide valuable information to potential investors or may represent the starting point for more complex assessments.

The continuous restructuring processes determine a specific dynamics and complexity of the urban structures, so that the need to analyze central functions is always beneficial.

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THE IMPACT ON TOURISM OF TRANSPORT INFRASTRUCTURE DEVELOPMENT IN TRANSYLVANIA

N. CIANGA[1], M.G. OPREA[2], L. BRUCKNER[2], L. GIURGIU[2]

ABSTRACT. The Impact on Tourism of Transport Infrastructure Development in Transylvania. The relationship between transport and tourism is exemplified by the term **travel**, and generally for making the decision to travel we take into account especially the main steps, those tied to the destination, how and where the route is. The attractiveness of a tourist area is also given by its degree of accessibility; a higher index involves an increase on both attractiveness and tourist options. The development projects of transport infrastructure will impact on tourism based on their location to the main objectives. Our analysis in terms of accessibility of tourist attractiveness has shown that some areas will be favored and will open new opportunities for tourism development in Transylvania.

Keywords: *Transylvania, transport infrastructure, tourist attractiveness, accessibility, impact on tourism,*

1. INTRODUCTION

The purpose of this study is to analyze the tourism attractiveness in Transylvania through the improved accessibility to tourist resources with the development of new transport infrastructure projects. As known in the practice of tourist facilities, tourist attraction index has an important role in determining the amount of tourist areas - regions, areas, tourist resorts and in setting opportunities and opening up priorities in tourism.

Accessibility is a key element to a destination, both in geography and in general, because it is a direct expression of mobility, either in terms of people, freight or information. This well developed transport infrastructure and the efficient transport system offer high levels of accessibility while the least developed ones have lower levels. The road infrastructure in Romania sums up a total of 81.693 km of public road out of which approximately 20.5% of European and national roads, 42.5% of county roads and 36.5% of communal roads, the fast roads being barely 0.5%. These transport systems sum up barely 310 km of which only 53 km in Transylvania, and with the rapid development of road projects new opportunities and tourist development of several Transylvanian areas emerge.

2. CONCEPTUAL BACKGROUND, HYPOTHESIS AND METHODOLOGY

As you know over the years many researchers have tried to show that accessibility is an important factor in the development of a destination and its attractivenes index. Such theories

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for calculating the total level of accessibility and the number of connectivities to a network have been developed by Taaffe E, Gauthier H, O'Kelly M (1996), that presented *a matrix model of connectivity*, which is practical and useful for understanding the elements, concepts and the structure of a network that can be applied regionally and locally, or by Rodrigue J-P., Comtois C., Slack B. (2006) who presents several models for calculating array of *accessibility and connectivity, Geographical accessibility and potential accessibility.* But in terms of tourism we should take into account more factors than the attributes of place and not just some simple variables, such as nodes but rather their degree of complexity and the influence they have in the area. So Lew A, Mckercher B (2003) attempted an approach to the relationship between transport and tourism thus to define the atttributes of the place only for tourists distinguishing two main themes: first the destination (its tourist attractiveness) and the second on tourist behavior, or variations not related to the destination. The system applied by them was called ETEZ and was manufactured by **Duval**, **D.T.** (**2007**), he developed the optimized space compared with the time and demonstrated that a tourist trip of a day over shorter distances are a lot higher because of their accessibility and at the opposite side the holidays that are at a greater distance and also at a greater amount of time have less accessibility.

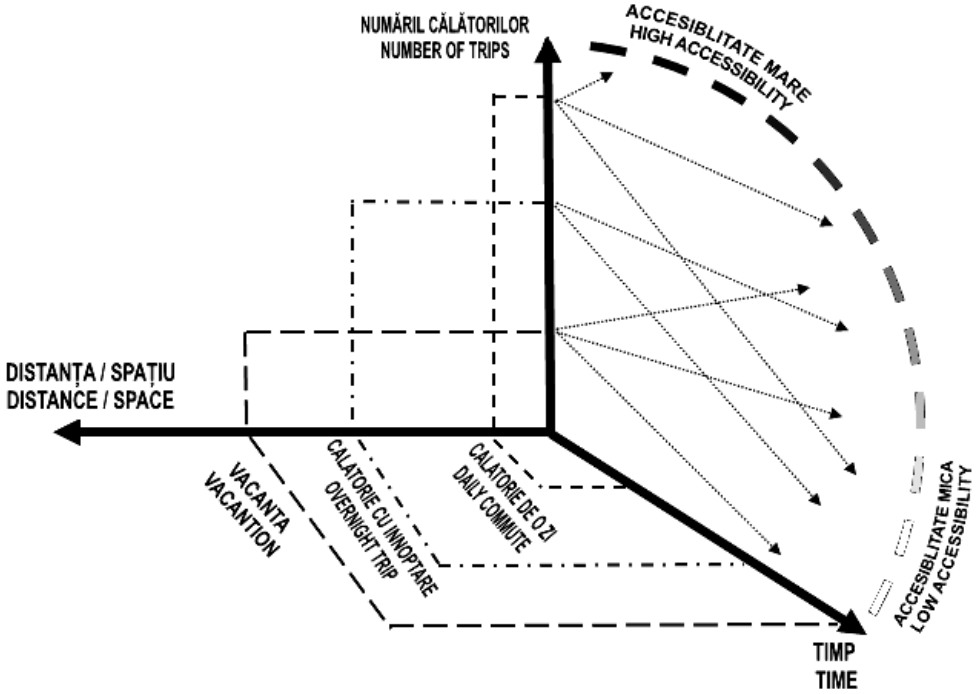

Fig. 1. Time-space optimisation model in the context of accessibility
Source: *Adapted from Duval (2007).*

As an hypothesis we can take the model in figure 1 which determines the decay distance of tourist flows, which were able to determine the characteristics of tourist demand in choosing a destination, and this has proven smaller areas with a mostly weaker offer, choose nearby destinations and a shorter time compared to other more remote areas who choose a longer duration. So assuming the availability of several development areas would increase after major infrastructure projects, the tourism would increase its attractiveness as well and that of the number of trips. To determine these areas we tried to assess ATU as possible holiday destinations in evaluating the attractiveness index which has an important role in determining the choice of destinations. Quantifying the result of evaluating the attractiveness of the tourism potential of the territory remains a challenging task in terms of its complexity, or the importance of the hierarchy of its parts, or the number of criteria were taken into account in assessing them.

Based on theoretical and methodological approaches so far on achieving the principles of zoning tourism planning m tourism potential assessment has been conducted administrative-territorial units in Transylvania using the following formula:

$$\Delta\tau = \sum_{A1+\ A2+\ A3}^{0\text{-}10\ \ 0\text{-}10\ \ 0\text{-}5} + \sum_{B1+\ B2+\ B3+\ B4+B5}^{0\text{-}8\ \ 0\text{-}5\ \ 0\text{-}4\ \ 0\text{-}4\ \ 0\text{-}4} + \sum_{C1\ +\ C2\ +\ C3\ +\ C4+\ C5+\ C6}^{0\text{-}6\ \ 0\text{-}3\ \ 0\text{-}3\ \ 0\text{-}3\ \ 0\text{-}8\ \ 0\text{-}2} + \sum_{D1+\ D2+\ D3+\ D4}^{0\text{-}10\ \ 0\text{-}5\ \ 0\text{-}5\ \ 0\text{-}5}$$

where $\Delta\tau$ is *tourist attractiveness* and A represents the tourist components of the landscape with its subdivisions: *the natural morpho-landscape (A1)*, the *therapeutic factors (A2), the natural protected areas (A3);* B stands for the anthropic framework components having his own following subdivisions: national interest historical monuments (B1), museums and public collections (B2), folk art and traditions (B3), performance institutions (B4) and repeated concerts and cultural events (B5); C is specific tourism based infrastructure with accommodations ordered by size and diversity (C1), food units (C2), conference and meeting rooms (C3), treatment units (C4), seasonal recreational facilities (C5) informational and technological facilities (C6); D is the accessibility coefficient composed of road transport (D1), railway transport (D2), water transport (D3) and air transport (D4) using the model to calculate the accessibility coefficient by M.G. Oprea (2011).

Data collection and methodology for awarding the scores used for each subdivision is based methodology developed by Romanian researchers in developing NSP (National Spatial Plan) for A and B components except those of international interest which have been awarded 25 points from the start, for the C component the data were collected by statistical reports of 2010 and in section D was used the model of calculating the accessibility designed by M.G. Oprea (2011).

The data regarding the new infrastructure development projects have been purchased from the CNADR database and focused on major infrastructure projects in Transylvania as can been seen in figure 3.

3. ANALYSIS RESULTS

After tracing the major infrastructure projects an attempt was made on a reanalysis using the same model to determine the areas that have changed their attractiveness.

3. 1. Analysis of the current attractiveness

Applying the attractiveness formula presented above to all the 684 administrative units in Transylvania we can see that the results emphasize the high value of **the natural components** in the following localities: Băile Tuşnad, Sovata, Borsec, Ocna Sibiului, Geoagiu, Braşov, Bran, Covasna, Rodna, Sângeorz-Băi si Gheorgheni, all with accumulated values over 16 points, way

more than the regional average of 8.12 points. Our analysis on anthropogenic framework components emerged the following results: ATU with components of UNESCO have gained maximum points, such as Oraştioara de Sus, Boşorod and Băiţa from the Hunedoara county, Săsciori and Câlnic from Alba county, Sighişoara and Saschiz from Mureş county, Valea Viilor and Biertan from Sibiu, Buneşti Prejmer from Braşov or Dârjiu from Harghita county and the town of Sibiu which has accumulated the maximum score being closely followed by Braşov and Cluj-Napoca.

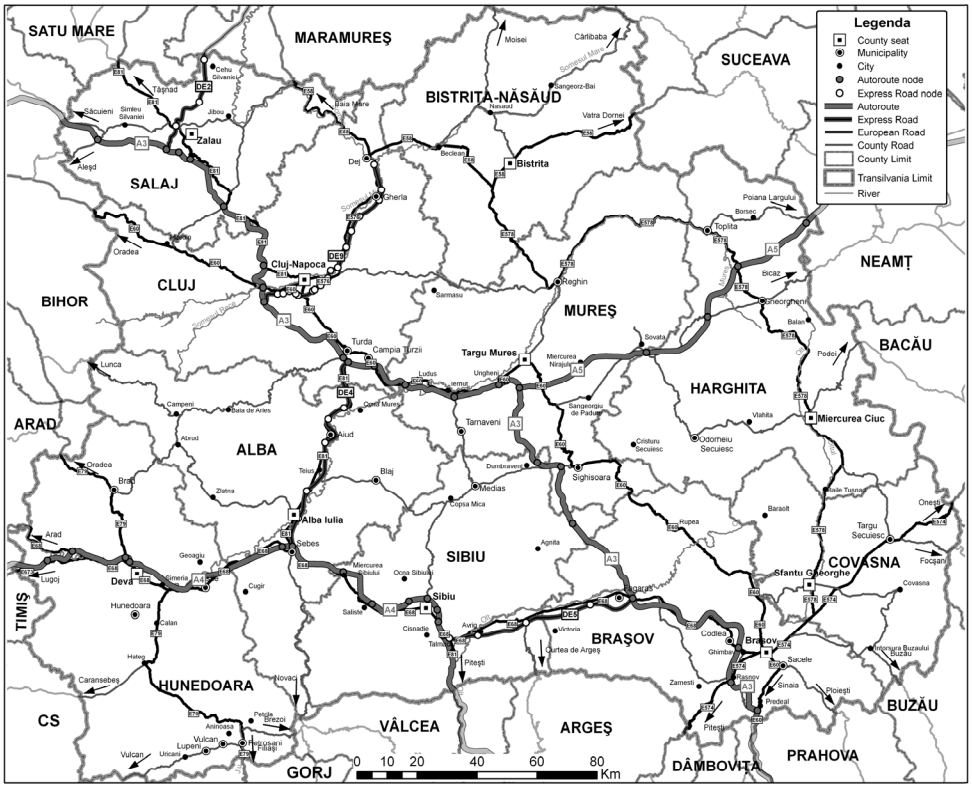

Fig. 2. The main road infrastructure development projects in Transylvania.

Infrastructure components analysis highlights the main tourist sites ATU which developed both the accommodation and treatment facilities as well as the entertainment ones. Topping the list is Sovata, Gheorgheni, Sibiu, Braşov and Predeal, but other smaller units with a well set up infrastructure such as Turia, Praid and Arieşeni that slowly begin to compete with places of interest in Western Europe.

For accessibility analysis we can see a detachment of Cluj-Napoca but also of the main units at the crossroads of several major roads and main railway lines such as Teiuş Iernut, Turda, Ungheni, but also some that punch through the site from the highway and
major airports such as Gherla, Apahida, Huedin.

A.T.U. main values accumulated from the analysis of tourist attractiveness **Table 1**

Crt. no.	The natural components	Points	The anthropic components	Points	Tourism infrastructure	Points	Accessibility	Points	Attractiveness	Points
1	Băile Tuşnad	23.50	Sibiu250	25.00	Sovata	19.00	Cluj-Napoca	20.00	Sibiu	18.00
2	Sovata	23.00	Sighişoara	25.00	Gheorgheni	18.00	Sibiu	17.00	Brasov	17.50
3	Borsec	21.00	Biertan	25.00	Sibiu	16.00	Târgu Mureş	15.00	Cluj-Napoca	17.25
4	Ocna Sibiului	20.00	Prejmer	25.00	Predeal	16.00	Huedin	15.00	Târgu Mureş	15.00
5	Geoagiu	18.50	Orăstioara de Sus	25.00	Braşov	16.00	Teiuş	15.00	Sf. Gheorghe	14.87
6	Braşov	16.00	Dârjiu	25.00	Sf. Gheorghe	15.00	Iernut	15.00	Miercurea Ciuc	14.75
7	Bran	16.00	Saschiz	25.00	Miercurea Ciuc	15.00	Apahida	15.00	Sighişoara	14.50
8	Covasna	16.00	Câlnic	25.00	Bran	15.00	Brasov	14.00	Gheorgheni	14.37
9	Rodna	16.00	Săsciori			15.00	Turda	14.00	Geoagiu	13.62
10	Sângeorz-Băi	16.00	Boşorod	Table 1		14.00	Alba Iulia	14.00	Turda	13.50
	Transylvania	**8.12**	**Transylvania**	**6.68**	**Transylvania**	**1.63**	**Transylvania**	**8.18**	**Transylvania**	**6.12**

The values of the main counties from the analysis of tourist attractiveness **Table 2**

Crt. no.	The natural components	Points	The anthropic components	Points	Tourism infrastructure	Points	Accessibility	Points	Attractiveness	Points
1	Hunedoara	10.80	Covasna	9.41	Harghita	2.95	Cluj	9.41	Sibiu	6.84
2	Alba	9.51	Sibiu	9.00	Braşov	2.32	Mureş	8.87	Braşov	6.61
3	Bistriţa-Năsăud	9.18	Braşov	7.70	Covasna	2.00	Sibiu	8.67	Alba	6.58
4	Harghita	9.07	Alba	7.24	Alba	1.85	Braşov	8.26	Hunedoara	6.37
5	Braşov	8.30	Bistriţa Năsăud	6.25	Hunedoara	1.82	Sălaj	8.13	Covasna	6.33
	Transylvania	**8.12**	**Transylvania**	**6.68**	**Transylvania**	**1.63**	**Transylvania**	**8.18**	**Transylvania**	**6.12**

For accessibility analysis we can see a detachment of Cluj-Napoca but also of the main units at the crossroads of several major roads and main railway lines such as Teiuş Iernut, Turda, Ungheni, but also some that punch through the site from the highway and major airports such as Gherla, Apahida, Huedin. The attractiveness analysis underlines that the top of ATU is Sibiu with a triple score over the regional average, followed by Braşov, Cluj-Napoca and Târgu Mureş, but also by some resorts from Transylvania such as Turda, Geoagiu, Bran,, Moeciu or Sovata, encompassing a much more attractiveness than the regional average.

The packing ring analysis of counties observed a distinction between the counties which have natural resources profiles such as Hunedoara, Alba, Bistrița-Năsăud that have national parks on their territories which has significantly increased the score and others that are around the regional average. Anthropogenic components analysis results reveal counties where traditional culture is well promoted and preserved in local museums such as the case of Covasna county, and counties where the Transylvanian Saxon culture has left its mark and charm that completes the multicultural crown of Transylvania. After analyzing the specific tourist infrastructure profile we can see that mountain counties where there are many winter recreational facilities dominate the rankings, but the average in this segment is very low. In ways of accessibility counties which have airports in their territory stand out but also those whose territories have important railway junctions. In an overall analysis of the attractiveness in its upper top ranks counties in the south of Transylvania: Sibiu, Braşov, Alba, Hunedoara who have earned a score above the regional average and that is both successfully representing the Transylvanian culture, traditions and natural beauty rounded in the vast garden of the Carpathians.

3. 2. Future attractiveness analysis

After recalculating the accessibility we can see that many ATU's values have changed and some have been more or less affected, so as we can see in figure 4 the biggest changes occured in the area of Braşov, Sibiu, Alba and Sălaj counties.

With the completion of new infrastructure projects in Transylvania will change that of the accessibility index and of the rate of attractiveness of many parts as well, some of them may be affected more, some less or at all, this having a negative aspect on tourism as shown in figure 4.

Among those localities positively affected we would like to enumerate in the county of Braşov, where it will be a big increase in accessibility and attractiveness mainly because of the new airport construction and the A3 highway or road specifically Făgăraş and Sibiu, and that directly affects them, the following: such as Bod, Braşov, Codlea, Făgăraş, Hârşeni and Şercaia, but also those who are less affected, such as Alba Iulia, Teiuş and Vinţu de Jos from Alba county, Cristian, Mândra, Poiana Mărului, Predeal, Recea, Sâmbăta de Sus, Soars or Voila from Braşov, or those from Sibiu county, Boiţa, Sadu, Racoviţă, Şelimbăr or Tălmaciu. A total of 46 sites ATU will have a positive impact and increase accessibility with up to four points, from which we can mention Sebeş, Ghimbav, Homorod, Prejmer, Rupea, Zărneşti, Ilieni, Orăştie, Crasna, Zalău, Avrig or Sibiu. Also after recalculation we may notice that some areas remain as isolated from this point of view as before and here the most noticeable ATU's are in the Apuseni Mountains, in the north of Bistrița-Năsăud and Sălaj counties, but also areas enclave situated between the main ways of communication such as the Secaşului Plateau or the Transylvanian Plain.

Fig. 3. The impact of infrastructure development on tourism attractiveness of Transylvania

4. CONCLUSIONS

With the ending of major transport infrastructure projects, the accessibility of many ATU sites increases especially in poor intersection areas and beyond. With the increased accessibility of these areas will indirectly increase the number of day trips and overnight trips and will facilitate the access to many resorts and national parks that will surely appear on many tourists option list to spend their holidays.

By improving the fast transportation infrastructure road, most of the heavy and the freight traffic would be taken up by these new routes, thus leaving the possibility of tourism development of roads and road travel. In this respect we can mention several thematic roads in Transylvania with tourism potential such as Scenic Roads-(Transfăgărăşan, Transalpina, DN 12C – the Transcarpathian road in Cheile Bicazului area, etc.), Thematic Tourist Routes like Wine Road, Mineral Water Trail, Gold Road, Spruce Pine Road, Limestone Trail, The Maramureş Heritage Trail, Tur River Trail and a Salt Road (N. Ciangă and M. G. Oprea, 2010) which would lead to a significant increase of tourist flows in Transylvania.

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THE ANALYSIS OF THE TOURISM INFRASTRUCTURE OF ALBA IULIA CITY

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ABSTRACT. – The Analysis of the Tourism Infrastructure of Alba Iulia City. Tourism plays a very important role from the point of view of its contribution to the local economy and from the point of view of creating a positive and attractive imagine of the urban centre or region it promotes. This is the premise that stays at the basis of this study. Therefore, I conducted my research from two perspectives.The first one identifies the touristic resources of the city, capable of sustaining the cultural tourism and its capacity of receiving tourists. The second one is concerned with analyzing Alba Iulia in the regional context. The position of Alba Iulia in the Transylvanian region has a major impact on the evolution of the cultural tourism because of its proximity of two important urban centers. This proximity is responsible for the type of tourism the town experiences, namely the transit tourism. At the city level, the anthropic resources are poorly promoted and therefore some touristic strategies with the role of promoting these resources and of improving the imagine of the city should be taken.

Keywords: *anthropic resources, material base, infrastructure, cultural tourism, transit tourism.*

1. INTRODUCTION

In a regional system towns generate competitiveness and regional growth through their concentration level of economic activities, mainly through the service sector (technology, financial, business, entertainment, tourism and so on). The development of the local economy depends very much on the level of development and the specialization of this sector.

After the 1990s Alba Iulia municipality, with a relatively central position in Romania, developed the service sector, becoming mainly a service town, its industrial character reducing substantially after the economic restructuration. Because of its centrality in Alba County and also because of its high potential, beginning with 1994, the town became a focus point for many foreign investors, with positive consequences on the employment level and on the growth of the foreign invested capital at the county level.

Nevertheless, today, Alba Iulia has some fields belonging to the service sector that aren't capitalized. This is the case of tourism. The poorly evaluated touristic potential of Alba Iulia town is reflected in the reduced number of monthly tourists registered at the county level in comparison with the neighbouring counties. In 2003 Alba County registered 4200 tourists per month in comparison with Mureş County with 10.000 tourists per month, Cluj County with 20.600 tourists per month and Sibiu County with 24.000 tourists per month. In consequence, these neighbouring counties exceeded the Alba value between 2.3 to 5.7 times (The Development Strategy of Alba Iulia Municipality, 2005). This situation ask for the identification of some promotion and development strategies of the cultural tourism, with positive effects on the quality of urban life, foreign capital investments and on the way the city is perceived as an attractive urban center.

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2. DATA SOURCES AND METHODOLOGY

This investigation is based on four different data sources: National Institute of Statistics (NIS), National Territory Development Plan, Cluj-Napoca and Sibiu National Airport. Data from NIS is conclusive, but there is a specific case in which data provided by this institution doesn't match with the one in the field. This is the case of the boarding houses. The number of boarding houses registered by the NIS is lower than the number of functioning boarding houses. This is a typical phenomenon not only for this region, but other regions in Romania, the tourist reception structure is not declared for profit purposes. Although data offered by NIS is recent, we have used data from National Territory Development Plan, Section V, in order to compare the information.

Because there is no institution preoccupied with providing specific data regarding the activity of each airport, in order to identify the evolution of Cluj-Napoca International Airport and Sibiu International Airport, information from these institutions was needed. Because we agreed that these airports have a regional function we needed data regarding the main destinations, the airlines and the evolution of the landing-embarking passengers to sustain our statement. This provided enough evidence to conclude that the airport is a place where people, money and goods are continuingly exchanged.

3. THE ANTROPIC RESOURCES OF ALBA IULIA MUNICIPALITY AND THE IMPORTANCE OF ITS LOCATION IN TRANSYLVANIA

The tourist potential of Alba Iulia is represented by: the monuments with historical value, the archeological sites, the museums, different cultural institutions, to which is added the fairs and other events that sustain art and popular tradition, specific for this region. The material base, which implies the totality of housing, therapeutics, recreation, food service and transport means, intended to satisfy the touristic demand (N. Ciangă, 1998), is a determinant factor regarding the development of cultural tourism. At Alba Iulia level the material base is poorly diversified especially when it comes to recreation and restaurants.

The historical monuments with national and universal value, the archeological sites, the museums, represent the anthropic resources of Alba Iulia city. Because they certify the presence of some old civilizations on the territory of the actual town, these sources become extremely important resources for tourism, unfortunately poorly capitalized by the local authorities. This is reflected in the low number of tourists attracted by Alba Iulia potential in comparison to other Romanian towns of the same range and in the low number of tourist reception structures (10 suchlike structures according to NIS).

The poorly capitalized anthropic resources imply the identification and application of some tourism development strategies, intended to attract a higher number of tourists and whose final result is the support and the development of local and regional economy.

3. 1. The position of Alba Iulia city in Transylvanian Region

An analysis of Alba Iulia position in the territory reveals its location at almost equal distances from 3 important urban centers, two of the same range and one of a superior range. Therefore, on south-west direction, at a distance of 77 km there is Hunedoara-Deva urban agglomeration, on the south-east, at 73 km is located Sibiu town and in the north of Alba Iulia there is Cluj-Napoca, at 95 km distance. The four towns form a scalene triangle, Alba Iulia being situated in its centre (fig. 1). From the point of view of promoting Alba Iulia as a national and international touristic destination, this proximity offers some advantages.

The first one refers to the possibility to increase the regional competitiveness; towns like Alba Iulia, Deva or Hunedoara, with a poorly capitalized anthropic potential, are driven in the competition for attracting the higher number of tourists.

Secondly, another advantage results from the strategic location of Alba Iulia municipality at short distances from two international airports, one located in Cluj-Napoca and the other one in Sibiu. This means that Alba Iulia has the advantage of using the already established connections of these airports.

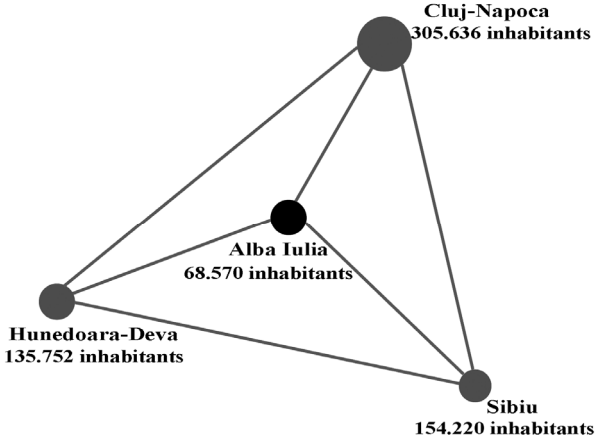

Fig. 1. Alba Iulia municipality and its position in comparison with the closest urban centers and urban. agglomerations.

A third advantage arises from the location of Alba Iulia near the urban centers of whose touristic potential is capitalized: Cluj-Napoca and Sibiu. This leads to the increase of the municipality's attractiveness not only for the international tourists, but also for the potential investors, the urban imagine having a major role in the decision of firm location.

Equally, the development of tourism will have direct effects in attracting tourists of different nationalities, in increasing the tourist reception structures and indirectly, in the development of new jobs, in the level of involvement of the local authorities and other local institutions and finally the improvement of urban life.

3. 2. The historical monuments of Alba Iulia and other cultural institutions capable of sustaining cultural tourism

Alba Iulia's historical monuments of national and universal value

Table 1

Historical monuments of national and universal value	23
Of which:	
Archeology (development, monument, site)	5
Architecture (development, monument, site)	17
Memorial (development, monument, site)	1
Monuments of public forum (development, monument, site)	0

Source: NIS, National Territory Development Plan, Section V.

Away from the advantageous position of the city in the Transylvanian region, another favorable factor for the development of tourism is the presence in the urban territory of historical monuments of national and universal value. They include: archeological, architectural, memorial monuments, ensembles and sites and of public forum (monuments, churches, historical centers, urban developments, different other old buildings of historical importance). In Alba Iulia there are 25 such objectives among which: Alba Iulia Borough, Batthyaneum Documentary Library, Apor Palace, Princes Palace, „Nicolae Bethlen" House, today The Roman-Catholic Theological Faculty, the Roman Camp and The Old Borough, the Roman-Catholic Cathedral „Saint Michael" or the „Holy Trinity" Cathedral (table 1).

Alongside the monuments of historical value, the cultural patrimony of Alba Iulia includes other institutions that preserve values of historical importance, like National Museum of The Union Alba Iulia. This institution accommodates archeological, historical and ethnographical collections and organizes multiple national and international expositions (table 2).

The anthropic resources of Alba Iulia city

Table 2

Museums (2009)	1
Type	History, archeology, ethnography
Entertainment and concert institutions (2009)	1
Art and popular tradition (festivals, fairs, feasts, popular craft)	Yes

Source: NIS, National Territory Development Plan, Section V.

The evolution of the visitors at the National Museum of The Union

Table 3

Institution	Years	Number of visitors
National Museum of The Union Alba Iulia	2005	48009
	2006	55158
	2007	57181
	2008	67181
	2009	50503

Source: NIS.

Analyzing 2005-2009 period, regarding the evolution of annual visitors to the Museum of Union we observe a continuing increase of this indicator until 2008, after that its value subtracts suddenly (table 3). An explanation for this situation is the role Alba Iulia plays in the regional context as a transit town because of its presence in the neighborhood of Sibiu and Cluj-Napoca, towns which have a more diverse touristic offer. This circumstance demands the adoption of some measures responsible with the promotion of this institution at the national and the international level. Taking into account the short distance between the four towns, the realization of a touristic circuit which would include the touristic objectives of Alba Iulia and the other three towns would be a proper measure.

In comparison with other urban centers from the region, like Cluj-Napoca or Sibiu, Alba Iulia doesn't have entertainment and concert institutions like theatre, philharmonic or opera (table 4). On the one hand, this is a characteristic that differentiates cities like Cluj-Napoca with a population higher than 300.000 inhabitants (first rank), where the demand for cultural products is higher, from towns of lower range (second rank), with a population around 70.000 inhabitants, like Alba Iulia. On the other hand, at the level of Alba Iulia, there is only one entertainment and concert institution represented by „Prichindel" Puppet Theatre. This type of theatre addresses to the young and middle age groups and therefore doesn't have the capacity to offer cultural programs for adults and older people.

3. 3. The material base of Alba Iulia city

From the touristic point of view, besides anthropic or natural resources, a town or a region has to meet other conditions in order to become attractive. In consequence, apart from resources, a town or a region has touristic potential if it owns a material base (housing, recreation, food service means etc.) and a developed infrastructure that is in a direct relation with the material base.

Alba Iulia has 10 units for touristic reception with housing functions that have a total capacity of 616 rooms. 50% of these units are represented by hotels, with a total capacity of 470 rooms, more than 70% of the total number of housing rooms at the municipality level (table 5).

The entertainment and concert institutions of Alba Iulia, Cluj-Napoca and Sibiu

Table 4

Towns	Alba Iulia	Sibiu	Cluj-Napoca
Entertainment and concert institutions	1	6	7
Type	Puppet theatre	Theatre, philharmonic	Theatre, puppet theatre, philharmonic, orchestra, artistic ensemble.

Source: NIS, National Territory Development Plan, Section V.

According to statistical data, the most attractive are the hotels, being followed by boarding houses and then by the touristic villas and motels. The number of nights spent in hotels increased in 2010 with 2.514 nights and also in comparison with the boarding houses, which registered a diminution comparatively to 2009, with 815 nights (fig. 2).

The data provided doesn't reflect the real situation because many boarding houses and touristic villas aren't registered or doesn't belong to any touristic association. This makes it very difficult to quantify them. In reality the number of touristic boardings outnumbers the one of the existing hotels. This highlights the tourists option to choose the boarding houses and touristic vilas type of housing because of the optimum relation between services and costs.

Almost all the hotels and boarding houses are located in the city center or near the center. This represents a major advantage for the cultural tourism and also for the business one, a new form of tourism that developed after the foreign investments were made in different industrial branches, especially after 2004. The development of business tourism resulted in the development of some more specialized housing capacities. An example is Park Hotel from Alba Iulia, the only 4 stars touristic reception structure from Alba County.

Alba Iulia tourist reception structures with housing function and their capacity (2010)

Table 5

Hotels	5
Other tourist reception structures with housing function	5
Total number of accommodations (2010)	616
Of which:	
Hotels	470
Motels	16
Touristic villas and boarding houses	130

Source: NIS

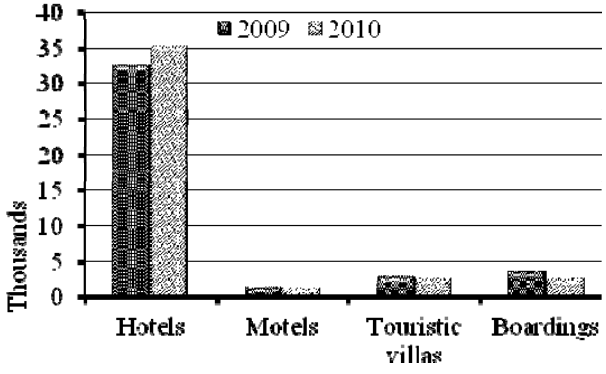

Fig. 2. The nights spent in tourist reception structures from Alba Iulia, in 2009 and 2010.

Source: NIS.

Correlating the number of housing units with the town position in the Transylvanian Region, their number isn't low as Alba Iulia develops a transit type of

tourism because of Cluj-Napoca and Sibiu proximity. Also the lower touristic objectives from Alba Iulia in comparison with the numerous ones from Cluj-Napoca and Sibiu, and the few cultural programs act as impediments in the decision of tourists to stay over the night. In addition, the climatic particularities influence the cultural tourism, offering optimum conditions only approximately 6 month per year, in the hot season period.

3. 4. The transport infrastructure of Alba Iulia city and its importance in the regional context

The transport infrastructure has an overwhelming role in sustaining and developing tourism. From the point of view of the road transport, Alba Iulia is traversed by roads of European and national importance, like E81 and DN1, that link the town with the neighbouring urban centers. The connection with Cluj-Napoca is realized in 1 hour and 28 minutes, following the European road E81, road that connects Romania and Ukraine. Same European road permits the linkage between Alba Iulia and Sibiu, the distance being covered in less than an hour (59 minutes). The national road DN1 and DN7 connects Alba Iulia and Hunedoara-Deva urban agglomeration, situated in the west part of the country and can be done in 1 hour and 9 minutes (fig. 3).

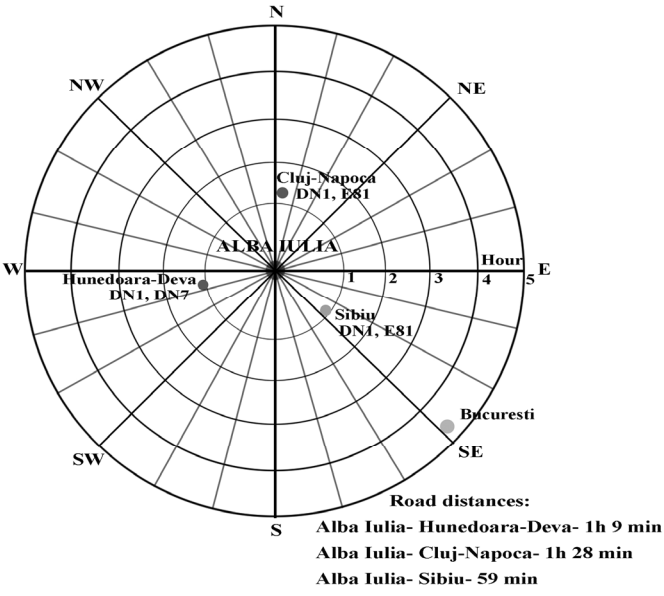

Fig. 3. Road distances between Alba Iulia and the closest urban centers.

The finalization of Braşov-Oradea highway, which includes in its route Cluj-Napoca city, will have a major influence on tourism from the point of view of the infrastructure impact. In his study based on the effects of a new highway on tourism, Javier Ferri, 2004, believes that the impact of a highway varies and depends on the origin of tourism, province of destination and the highway section in discussion. In our case, the presence of a highway in the region may constitute an advantage in attracting tourists from countries like Slovakia, Hungary, Austria and Serbia, whose locality of origins is at a few hours distance from Alba Iulia. In this case, Cluj-Napoca would be an important receiving point for tourists, regarding the road transport, and as is stated next, regarding the aerial transport.

In conclusion, the road infrastructure of Alba Iulia is developed, linking in a short time Alba Iulia from important urban centers. The only problem appears when it comes to the quality of these roads. Some sectors are totally and some are partially terraced because of the local authorities' bad management. Nevertheless, these connections are important regarding the tourist's access to the closest airport.

The absence of an airport in Alba Iulia is at the certain level compensated by the presence in the region of two international airports: Cluj-Napoca International Airport and Sibiu International Airport. At relatively short distances from Alba Iulia these airports can serve as receiving poles of foreigner tourists. The main connections of these airports are with countries from Europe likewise: Hungary, Austria, Germany, United Kingdom, Spain, France, Italy or Cyprus (fig. 4).

From all the 23 cities 4 are important European capitals: Budapest, Wien, London and Rome. The exchange of tourists between the 3 Romanian cities, Alba Iulia, Cluj-Napoca and Sibiu, and the other European cities would mean the intensification of the flow of foreigner tourists in the central part of Romania and also the promotion of the region at the national and international level.

Analyzing the activity of Cluj-Napoca and Sibiu airports it is obvious the superiority of the first one regarding the number of destinations (fig. 4). This can be explained by the fact that Cluj-Napoca is a bigger and more developed city and therefore, under the condition of the continuing development of the metropolitan area and of maintaining diverse international relations with different institutions and investors, the airport must serve a higher number of citizens.

The activity of the two airports is highlighted by: the diversification of the main destinations, especially in the last years, the intensification of flights to these destinations (daily, weekly), the broadening of the airlines offer (table 6) and the continuing growth of the debarked-embarked passengers (table 7). The International Airport of Cluj-Napoca registered in 2007 a total number of the debarked-embarked passengers of 390.000 persons and in 2010 this number grew with more than 50%, registering 1.028.907 passengers. In the case of Sibiu International Airport this indicator grew sensitively from 9.800 debarked-embarked passengers in 2007 to 198.751 passengers in 2010.

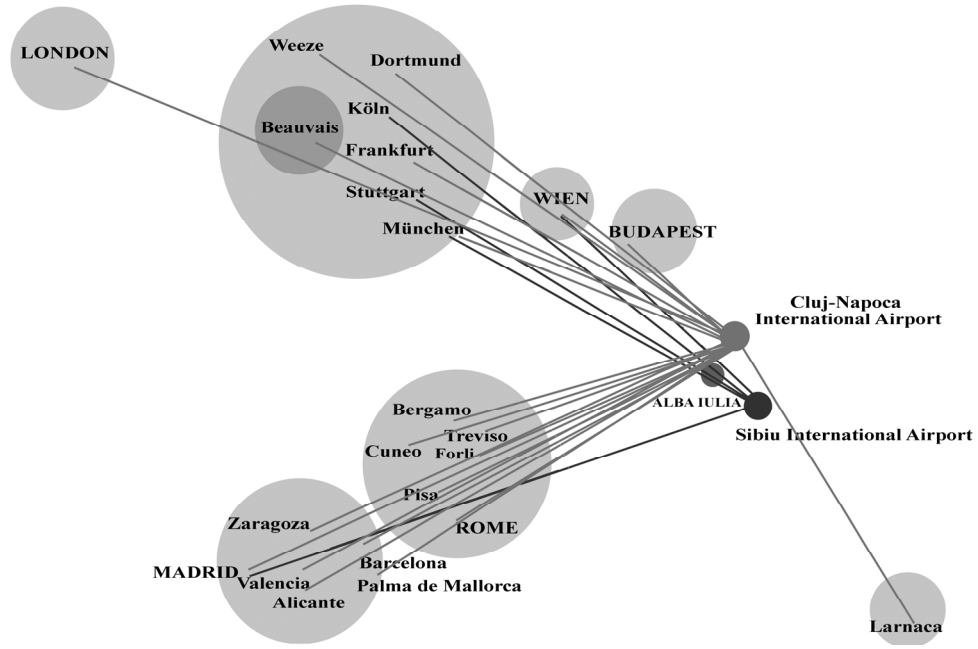

Fig. 4. Cluj-Napoca and Sibiu Airport main connections.

Source: Cluj-Napoca International Airport, Sibiu International Airport.

The evolution of the airlines that operate on Cluj-Napoca and Sibiu Airports

Table 6

Airports	Airlines	(of which) low cost
Cluj-Napoca	9	1
Sibiu	5	1

Source: Cluj-Napoca International Airport, Sibiu International Airport.

The growth in the last years of the passengers' number at Cluj-Napoca Airport is justified by the continuing development of the city. The evolution of the same indicator in the case of Sibiu Airport is justified by the European capital title Sibiu received in 2007, which made the municipality well known at the international level and consequently attracted tourists in the next years. Another reason for the increasing of the passengers' number is the development of new destinations and the contraction with new airlines.

The evolution of the number regarding landing-embarking passengers at Cluj-Napoca and Sibiu Airports

Table 7

Airports	2007	2008	2009	2010
Cluj-Napoca	390000	752.181	834400	1028907
Sibiu	9800	141020	154160	198751

Source: Cluj-Napoca International Airport, Sibiu International Airport.

The presence of the low-cost airlines, also known as no-frills, discount or budget carrier/airline (C., R. Goeldner and B. Ritchie, 2009), represents an advantage for the cultural tourism. In addition, the existence of two low cost companies in the airports' offer could create the opportunity for new destinations and so, multiple connections with the European region. These low cost companies represent a more flexible and less expensive opportunity for young people, with modest incomes.

Many studies are preoccupied launching different hypothesis regarding the impact of the transport development over tourism. Hakfoort et al., 2001, in their study regarding the regional impact of an airport, consider that the expansion of the airport's activity has impact over the number of firms in that area, over the number of visitors at different conferences and over the number of tourists. In consequence, it is vital for a city to have such a point, capable of generating higher waves of tourists, because the reduction of time travelling is important in the decision making of every tourist.

As central points in cities airports have two functions (Kramer, 1988, quoted by J. Hakfoort et al., 2001). One function refers to the role played by the airports in the regional economy and the other one is concerned with the transport node role the airport has. In the case of the second one the specialized literature identifies three markets of passengers. (Rietvelt, 1997) The first refers to the passengers from the region served by the airport, the second implies passengers who live in other regions and travel in the region and the third type of market refers to the transport passengers. From this perspective the transport costs for each type of passenger differ according to the destination, distance, time of flying and the chosen airline. In our case the tourists fall for the 2nd type of market.

Concluding, the presence of an airport brings many benefits not only for tourism, but also regarding the development of the served city. In Alba Iulia's case the absence of an appropriate airport can be at a certain level compensated by Cluj-Napoca and Sibiu Internationl Airport. This is in fact the result of the small distances the two towns are located from Alba Iulia. So, for the moment is a good opportunity for the town to take advantage of, in order to attract a higher number of foreign tourists.

5. CONCLUSIONS

The capitalization of anthropic resources present at the level of Alba Iulia municipality has as final scope the intensification of touristic flows and the international promotion of this urban center. This promotion implies a better experience with the Romanian products from this region and consequently a positive imagine of the urban center. The improvement of the city's imagine will have positive effects on attracting foreign investors, who, especially after 2000, are attracted by the natural and anthropic potential of Alba County.

The attraction of foreign investors will lead to the growth of foreign investments at the city and county level and finally the increase and development of some sectors belonging to the local economy. The intensification of the foreign investor-local firm relations will be materialized through the implementation of different programs regarding the qualification and specialization of the employees or internal training programs, the implementation of new technologies or the launch of new production lines. In these circumstances the investors will use the tourist reception structures which will mean the intensification of the usage of these units.

The analysis of the touristic infrastructure of Alba Iulia reveals the existence of some poorly promoted anthropic resources by the local authorities and touristic agencies centered, mostly, on external tourism. The type of tourism manifested at the town level is a transit one, a consequence of the proximity of Cluj-Napoca and Sibiu and also of the few cultural and entertainment programs.

From another perspective, this proximity, near two developed urban centers with a high power of attraction, may be an advantage from the point of view of using their infrastructure, mainly the aerial transport. Therefore, the relatively short distance of Cluj-Napoca and Sibiu from Alba Iulia offers the latter the possibility of using the two cities' airports, which become important regional poles of touristic reception.

In the regional context the realization of a touristic circuit that would capitalize the anthropic resources of Alba Iulia, Cluj-Napoca and Sibiu may lead to an increase of the number of tourists in Alba Iulia and a better advertising of its heritage resources. Moreover, realizing such a circuit would assure a constant number of tourists for Alba Iulia city and it would create a partnership between the local authorities and the diverse institutions present in each of the three towns.

If Alba Iulia's location near two important centers offers some advantages like: a better imagine in the regional context, the possibility to use the aerial transport system of the latter, it also offers some disadvantages. These limitations refers mainly to the fact that the city's few anthropic resources, in comparison to Sibiu or Cluj-Napoca will never make Alba Iulia a more than one day touristic destination. Therefore its position in the region will always offer the city the limited possibility to experience transit tourism.

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THE HIDDEN LANGUAGE OF THE HOTEL INDUSTRY

SILVIA IRIMIEA[1]

ABSTRACT. – The Hidden Language of the Hotel Industry. The tourism industry, which is one of the most competitive and unstable industries, depends heavily on what we may call a 'hidden language'. According to our approach, the 'hidden language' of the hotel industry refers to the elements of communication which are not necessarily tangible to clients but which are enormously influential in selling a tourism product. Since the pressure to sell the products and services is stronger in this business, the article looks at devices and instruments through which the communication between the hoteliers and the potential customers can be achieved and improved through the use of 'hidden language' devices. Amongst the discussed devices advertising devices avail of the most efficient resources to inform potential customers about the hotel and make the whole package attractive. The presentation of the instruments and their characteristics is instrumental for highlighting how they affect the customer and how they should be used.

Keywords: *communication, intangible, advertising, publicity, public relations, marketing, national and international notoriety.*

1. INTRODUCTION

The vital element in the life on any company is the customer. Its very existence depends on its capacity to draw tourists to it and convince them to purchase its product. Without customers, a company has no reason to exist. Customers are not necessarily the individuals we happen to run into when we go to pick something up from the store. Every industry has its own segment of customers, which have similar needs and common features that define them. There are companies that produce for other firms or even for the state in which case, the features of the customer and his needs or wants are very clear and, more importantly, constant. Situations where the producer knows exactly what his customers need and will need for the future are ideal from all points of view. But for the hospitality industry things are far from easy. We are talking about the most unstable and ever-changing environment a company can find itself in. There is no "textbook" for operation in hospitality. Its elements and components are constantly changing and the business environment or the outside world of the company is one of the most competitive in the world. It is this competition that makes a brutal selection between companies/hotels or businesses, sparing those who are strong enough to succeed and eliminating those who are not. The life of a company or firm activating in the hospitality industry is very fragile and can run through a roller-coaster from one semester to the other. Even though one year is extremely successful, it does not guarantee that the next one will be as well. In fact, it can almost lead to the worst case scenario in a matter of months.

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The reason for this very "unstable lifeline" for tourism companies, is that they are dealing with the most difficult aspects: the individual customer. There are as many opinions and expectations as there are people in the world. Each individual has his own idea about what he likes or dislikes and, especially, how he wants to spend his vacation. If things would be as easy as that, tourists would all probably enjoy the most exotic and luxurious getaways. But there is another important element: the budget. So, not only are individuals, or rather tourists, very different in their needs but also have different issues that affect their recreational experiences. Even more, the hospitality clientele is neither static nor stable. Tourists who visit one hotel are not tied to that particular establishment forever. Tourists like to experiment, visit, travel, see new things, experience different cultures so the probability that they should return to exactly the same hotel is, indeed, very low. Not to mention that in times of difficulty like the financial and economic crisis we are going through at the moment, travel and leisure activities are the first ones to be deleted from peoples' lists. Given the diversity of the modern traveler, the general context and the competitiveness of the hospitality industry, one might find this very discouraging and wonder how hotel owners manage to keep their businesses going. It is certainly not easy and only the ones who have been able to reinvent themselves and try to think "out of the box" have managed to survive. Realizing that the customer is the key element to such a business, owners know that they cannot wait for the customer to come to them and tell them what they expect but that they need to meet their customers' expectations before their first contact. The most successful owner has always been the one who managed to identify a need before the client himself realized he had it. Being one step ahead of everyone will always ensure a long and profitable life for companies in any industry.

The one and most important element in modern hospitality is attracting peoples' attention and getting people to notice one establishment over the other. In such a competitive environment, business owners try to offer something that others do not have. Constantly monitoring the trends that customers or tourists set and follow is a definite "must" in the hospitality industry. But how do hotel managers always find out what potential clients are looking for and how do they make their products and their services visible to them? It is clear today that focusing on the customer is the way to go if you want to survive. And the best tool for this is *communication*. Owners must keep a constant flow of information between them and potential, present or potential customers. However, not all hotel owners have realized how important communication is and they have failed. On the contrary, those who recognize the power of communication have also enjoyed a successful business.

2. THE HIDDEN LANGUAGE OF THE HOTEL INDUSTRY

Potential clients or tourists do not seem to notice or pay much attention to the exchange of information they take part in. Hotel businesses receive information from them that tells them if what they are doing, as far as attracting customers is concerned, is efficient or not. Although companies of every industry rely on their clients for their existence, hotels are in a position to deal with them on a personal basis. Hospitality is the only industry where production and consumption take place at the same time. Consequently, the pressure is more intense than in other industries. The bottom line is that in order to survive, hotels need tourists or customers, who should be informed about the existence of a particular hotel. This is possible through the elements of what we may call *the hidden language of the hotel industry*.

The *hidden language* of the hotel industry refers to the elements of communication which are not necessarily tangible to customers, but which contribute to the process of attracting them toward one establishment and sell its products or services. This further means that there are specific tools that hotel managers can use to draw the tourists' attention to their products. Playing by ear in this business will not to bring tourists in. That is why, notoriety must be built. But being known or simply heard of, is not enough to ensure success. Hotels must also provide some services or facilities that give them an advantage over their competitors and that make the hotel sought for. Modern day managers have understood that communication is the key to their success. Today, every detail of a hotel has something to say about it. Messages constantly reach potential customers and it is up to managers to control and make sure that the delivered message is, indeed, the one they expect.

The elements of this *hidden language* are numerous. Managers, on the one hand, will use every instrument or device at their disposal to send out as much information about the hotel as possible. They have long stopped waiting for clients to personally come to them seeking information and have looked for ways to include as much information as possible in sources that relate to it. Tourists, on the other hand, want to know everything about a hotel when they choose their accommodation for a trip. They need to know what services and facilities they may benefit from, how and if they are compatible with what they are looking for, what experiences they might have, what prices the products have, etc., and all this information is usually not gathered directly from the hotel, but from alternative sources. One basic source of information about a hotel, and the first one that people identify them by, is its *classification*.

Therefore, the first item of information that tourists look for is the number of stars of a hotel. This particular element provides a significant amount of information about the quality level, price range, facility and service variety etc. But why would tourists believe that the information provided by such a system is, in fact, correct? Mass tourism has started to develop during the 1950-1960s when the price of traveling by car, train or airplane became more accessible to more and more people. During that time, the governments and the national tourism organizations became interested in establishing official systems of registering or classifying hotels. The reasons were mixed. The need for a minimal standardization of the services in hospitality and the interest of the authorities to have some kind of control and placing taxes over the earnings of companies were the most important ones. In 1970 only 5 European countries had national classification schemes. In the 1980s the number grew to 22 countries and 60 countries worldwide which used classification systems. These systems are important because they place hotels in specific categories according to their type, the maintenance of the buildings, rooms, baths and public spaces' dimensions, existing facilities, additional services and the quality of their services. It is important to mention that at the moment there is no universal classification system for lodging establishments although efforts are being made in this sense. The purpose of any classification system is not only to help tourists make their choice regarding preferred services but also to offer accommodation which meets the imposed standards. In order to be applied successfully, the requirements of such systems must be very clear and periodically revised to include any progress that might be made. The symbols used vary with every scheme. The most frequently used systems are *stars* but letters of the alphabet, roof tops, diamonds, the sun, flowers and shields have been used as well.

There are many difficulties in creating a universal classification system but the World Tourism Organization has managed to put together a category called "world class hotels" whose main characteristics are: uniqueness, exceptional location, traditional hospitality, cultural significance and historical continuity. Although there is no internationally recognized system used worldwide, most countries have adopted the "star" symbol, but have localized the conditions and the facilities in order to better attain them. This is why, the first impulse, when we look for a hotel to spend our vacation in, is to find out the number of stars it has. However, the classification system is only the tip of the iceberg regarding the constant flow of messages and feedback between a hotel and its (potential) clients.

Once holiday makers have established the category in which they want to find a hotel, the next step is to find the hotel. If the tourist does not benefit from the support of a tour operator or a travel agency and have decided to organize their own trip, finding a hotel might be difficult as there are so many to choose from. Tourists tend to make this choice subjectively given the fact that they value their time for relaxation. This is where hotels must take advantage and use all available resources to stand out in the eyes of the client and convince him to choose a particular establishment over the other. Basically, hotels need to sell their products. And selling the products is based on communication or promotional skills. This task is usually performed by the marketing department of the hotel. Communication activities can be grouped in some distinct categories: basic communication, advertising instruments, the market launch of the hotel, building an image, and the communication tools adopted once the hotel is open to the public.

The class of basic communication elements comprises: *street posts*, *illuminated trade signs*, *exterior and interior design*, etc. *Street posts* are the first contact of the tourist with the hotel when he or she personally goes to ask for information or wishes to check in. These posts must be installed before the official opening of the hotel and must be maintained in perfect condition. People may consider it a detail but even a small street post can give away information about the business and its management. A clear, well maintained post will give the customer a reassuring feeling that the company pays attention to detail and quality and takes its responsibility very seriously. A rusty, bent, old post will enhance a negative first impression and serious reputation damage to the company. This is a good example of how important attention dedicated to detail is. The same goes for *trade lights* which, in spite of the paramount role they play in helping people find the hotel, are important details that can improve the image of a hotel. The hotel's design elements are truly crucial for determining a person to opt for one hotel or another. Hence, an increased attention must be shown to both exterior and interior design. Since people easily draw prima facie conclusions about a hotel, the first impression of the exterior can easily impact on the success of a business.

Although elements *of interior and exterior design* are less tangible, they create the style, the atmosphere and shape the image of the establishment. Through these three elements of design, the hotel sends out the message it wants clients to receive regarding the quality of the brand and the quality of the services it offers. Starting with the 1990s style has really become an important element in differentiating one hotel from another. Style creates a specific ambiance and atmosphere. These, in turn, can generate a certain mood that guests or visitors either enjoy or reject. As far as the messages that the elements of design convey, certain aspects must be remembered (N. Lupu, 1998):

- the targeted market segment and the location of the property influence the style of the hotel;

- the projection of the desired image through its design will attract the targeted clientele, especially if this image is combined with the correct price/quality ratio;

- the revival of an old trend during the 1990s will be focused on the correlation of the space offered to guests with the quality of the services and price. (Exceptions to the rule are hotels opened in historic buildings in cities and European metropolitan areas which attract an impressive number of tourists);

- the atmosphere, ambience and the mood created must support the "home away from home" slogan used by more and more hotels.

Exterior design is aimed not only at defining or identifying the presence of a hotel in the eyes of its guests, but also to set it apart from similar hotels and differentiate it from its rival establishments. In addition, the message expressed by the exterior design may "prepare" guests for what they will find inside. Exterior design elements stand for the exterior signs which are very useful to city hotels that are hard to find, such as: the company brand and logo, the colors used for the exterior of the building, the terraces and the areas around or inside the premises of the hotel.

The *interior design* must evidently be tailored on the purpose and use of the hotel areas or rooms. These spaces must be adapted to the envisaged use. There are many different spaces in a hotel, nevertheless, the most important ones are those that tourists have access to, like: public areas, the lounge, conference rooms, accommodation rooms, the food and beverage areas.

The main message of a hotel is sent by the lounge and the front desk area. This particular message must be an extension of the one conveyed by the exterior. At the same time, the functions of these areas must be preserved in order to enable guests and visitors to be received therein. As far as the spaces destined for conferences and leisure activities are concerned, the prevailing theme featured in the lounge must be preserved and continued. The accommodation area consists of rooms, the halls that lead to them, lifts and stairs. The design of the rooms can be either standard or different for each and the design of the restaurant, if there is only one, should pursue the theme(s) already used both for the exterior and interior of the hotel.

The advertising instruments are part of the promotion of a hotel and a major component of the communication process between the hotel and its clients. This task is usually the responsibility of the marketing department of hotels. In order to sell a product it is not sufficient for the company to put forward an offer. This offer must be accompanied by a coherent communication system which has the purpose of presenting and positioning the product on the market, raising consumers' awareness of a certain need that they might have and which can be satisfied by the product. Another goal of any hotel marketing strategy might be to preserve a favorable image of the company and thereby to persuade people to purchase the product or service.

As part of the hidden language of hotels, *advertising* is probably the element that is the most "visible" and present in the clients' mind. The fundamental role of advertising is to make the hotel known, to inform as many people as possible about its existence, the principles it stands for and the products and services it offers thereby convincing potential clients to purchase them. Advertising offers most of the instruments which hotels may use to increase their visibility to potential customers. Hotels rarely use all advertising and promotion instruments even though they have constantly proven their efficiency. Advertising must be supported by financial resources and hotels of different sizes have certain amounts of money that they can invest. Depending on the available resources, hotel managers must decide what advertising instrument(s) they will use which would better suit their business needs.

The communication tools available to a marketing manager can be grouped in five major categories which, in turn, contain a broad range of instruments which enable hoteliers to initiate and maintain communication with their potential customers. According to Cosma Smaranda (2004) the instruments are the ones shown in table 1.

Efficient communication between a hotel and its potential tourists is crucial for its survival. The message must be unambiguous and comprise all the information that a client might need and which may appeal to him or her. To better demonstrate the complexity of these elements of the hidden language it might be important not only to enumerate the instruments, but also to highlight the features that make them such important parts of this type of communication.

Instruments used for communication purposes

Table 1

Publicity[1]	**Sales Promotion**[2]	**Public Relations**[3]	**Personal Sale**[4]	**Direct Marketing**[5]
Ads in media outlets (TV, radio, cinemas, the press)	Games, competitions, raffles, lotteries	Press conferences	Commercial presentations	Catalogues
Billboards, bill posters	Gifts	Speeches	Business meetings	Materials sent by mail
Brochures and leaflets	Free samples	Seminars	Stimulation programs	Home shopping
Symbols and logos	Trade fares and commercial events	Year books	Samples	Internet
	Shows	Charity events		
	Demonstrations	Sponsorships		
	Discounts	Publications		
		Company magazine		
		Special events		
		Community activities		

[1] *Publicity* represents any type of impersonal presentation and promotion of ideas, goods or services paid by an identified sponsor;

[2] *Sales Promotion* refers to short term incentives with the purpose of encouraging clients to try and purchase a certain product or service;

[3] *Public Relations* include diverse programs meant to promote or protect the image of a company or its products on the market;

[4] *Personal Sale* implies making a personal connection with the client with the purpose of selling a product;

[5] *Direct Marketing* refers to the use of the postal service, the phone or any impersonal means of establishing a connection with people in order to send information or solicit answers from a well determined segment of clients.

For instance, the qualities that make *publicity* a crucial element of the promotional activities are:

- it is public, i.e. publicity targets a broad audience giving "legitimacy" to the product;
- it has the power to influence the targeted audience; by repeating the message several times, clients are provided with a reason to purchase and the possibility to compare the messages sent by rival companies;
- it is expressive and suggestive (any type of publicity, regardless of the medium requires a strong power of artistic creation which incorporates text, color, image, movement, sound and, most importantly, interaction);
- it is impersonal, i.e. leaves the audience to decide upon the degree of attention that they receive.

Although the instruments used in *sales promotion* are numerous and diverse, they all have three common characteristics:

- the power to communicate (any promotion captures the attention of the potential clients giving them information that might gear them towards a certain product);
- the power to stimulate (it incorporates a certain concession, temptation or contribution of some particular value to the consumer);
- the power to invite (it includes the clear invitation to close an "on the spot" transaction.

The influence exercised by *public relations* is based on its three distinct characteristics: the high degree of credibility, the audience's lack of reticence to overcome resistance and considerable power of expression.

Personal sale is characterized by its three basic features: interpersonality, long term impact, the need for receiving and providing an answer.

Although *direct marketing* appears in different, varying forms in practice, they all contain the distinct characteristics of this promotion medium:

- it is individualized, which means that messages must be adapted to the individual customer who must be convinced through different stages of the campaign;
- it is permanently and rapidly updated according to each individual;
- it is not public; the message destined for one person is not sent to other customers, reversibly it is even kept secret from rival companies.

The reason we have insisted upon this particular category of the hidden language of the hotel industry is because advertising instruments are the best tools to enhance a first contact between the hotel and the potential clients. Advertising devices avail of the most efficient resources to inform potential customers about the hotel and make the whole package attractive. The presentation of these instruments and their characteristics was instrumental to highlight how they work in relation to the client and what reaction they obtain from him. Other elements are either part of this category or depend on it. To be more precise, the basic communication elements would not probably have the same effect if tourists did not know about the existence of the hotel. In order to look for the hotel, first they need to know that it exists. Only after the first effort is made, the sign posts and other elements will help tourists identify the position of the hotel. The market launch of the hotel, as we shall see next, also relies on advertising tools to disseminate the information and make the hotel visible to the audience. All other elements of the hidden language are in some way or another linked to this particular category given the fact that through its instruments it is the direct link to the audience. The weight of an entire promotional campaign relies on the advertising tools that a hotel adopts. They need to capture the audience's attention and convince them to choose the hotel over others. The ultimate goal of any promotion

activity is to convince clients that the product offered is exactly what they are looking for. It is obvious that false promotion should be avoided at all costs and one should only promote what he or she has. Misleading clients is suicide to any hotel or company, for that matter.

The market launch represents a set of activities through which the hotel makes itself known on a *local*, *national* and *international* level to their intermediaries and potential clients. The promotional activities will be carried out gradually and approximately two months before the hotel will be opened. Although this particular category might not appear to have to do with our subject, you will find that there are numerous outreach activities given the fact that at this first stage in the life of a hotel client approach is vital.

It is crucial that the hotel should be known on the local market because this is where the main counsellors[1] are located. These are the main organizations in the area, the companies close to the hotel, other hotels and restaurants, rent a car agencies, airport services, air company representatives, travel agencies etc. Also potential client companies and agencies are found on the local market as well as travel agencies that might intermediate room booking for the hotel. It is for these prescribers but also for potential clients, intermediaries and mass-media that an unprecedented event shall be organized – the inauguration of the hotel. Usually such an event will be organized as a cocktail party.

The opening of the hotel and the facilities offered shall be brought to the attention of the public through *visits*, *letters*, *ads and articles in the media, invitations* to the cocktail party. To travel agents, restaurants and the nearest hotels but also for hotels in the same category, visits are very important as flyers and brochures are distributed. Personal contact will ensure that guests shall attend the cocktail party. A short letter will be sent to all organizations. The text of the letter will be adapted to the concerns of the recipient and will be accompanied by a flyer and a tariff sheet. Media ads and articles are also important as they multiply the effect of the visits and letters.

Achieving *national* notoriety is what every hotel is striving for and even smaller hotels need to find ways to meet tourists' needs. One first step to getting known on a national scale is to be registered in a *hotel or tourism guide.* These publications are of great importance for hotels as people seem to resort to them when they are looking for a pertinent opinion and advice regarding accommodation. These guides classify hotels and other structures according to their quality standards, range of services and facilities, overall experience and staff professionalism. Many such publications have gained world notoriety so their advice and classification are highly regarded by potential clients. *Travel agents* must also be recruited to support and facilitate the contact between the hotel and potential clients.

Internationally, the hotel must focus on the countries where most of its foreign tourists come from. *Tourist information offices abroad* can put the hotel into contact with travel agencies that might be interested in promoting the hotel in that particular country. The offers shall be transmitted to these agencies via mail, preferably in the language of the recipient.

All these intermediaries enhance the contact with potential tourists. As people travel more and on longer distances, seeking information personally at the hotel is very difficult and time consuming. That is why hotels have taken the steps toward their potential clients by making their offers available and at hand to them. At the present very few people still organize their own trips and usually resort to travel agencies where they can find the hotel that better suits their needs, proving that mediators are a crucial link or channel of communication between establishments and their clients.

[1] The ones who influence and guide the purchasing behavior.

Image refers to "the ensemble of mental representations, beliefs and knowledge regarding one object" (Martinet, 1986) while "trade mark" refers strictly to a registered mark. The creation and dissemination of the image does not actually represent a distinct communication instrument, but is rather the effect of the efforts put in the application of the basic communication, advertising instruments, and the market launch. An image which is representative for the objectives of a hotel is created through concerted actions that may or may not have promotional features. For example, when creating the image of a business segment oriented hotel, elements like location, equipment, name, design, advertising materials, intermediates, tariffs etc. are particularly important. The dissemination and control of the image is realized through the use of communication resources throughout the life of the hotel.

A possible classification of *the communication tools used after the hotel has been opened to the public* might include: *publicity*, *sales promotion*, *public relations*, *exhibitions, sponsorships*. As we mentioned earlier, all these elements of the hidden language have more or less to do with the main category of advertising instruments. We have already discussed the first three elements and therefore we shall only shortly mention them and provide a few additional details which have slipped in the category above.

Publicity groups mass media ads, promotional prints, mailing operations etc. For individual exploitation, mass-media often proves not only costly but inadequate. This is why specialized press is preferred as the message sent by the hotel is addressed to intermediaries like travel agents. Publicity activities take place outside the hotel and have long term effects and can be accomplished in collaboration with professional agencies outside the establishment.

Sales promotion includes various aspects, like: preferential tariffs for weekends practiced by hotels whose main segment is the business segment, weekly preferential tariffs offered by resort hotels in order to convince clients to spend more nights at the hotel, "2 for the price of 1" promotions, posters in lifts and halls, raffles, lower tariffs at the hotel restaurant for hotel residents, free accommodation for children in the parents' room, free room for children, adjoining rooms etc. Unlike publicity, sales promotion activities are carried out at the hotel for a short period of time and have short term effects.

The *public relations* actions are the ones that focus on the creation of a favorable image of the hotel through invitations, visits and event organizations. On the one hand, an important task of public relations is represented by the 'person-to-person' communication with competitors, prescribers, local authorities, professional organizations etc., which helps the hotel become a part of the social-economic environment of the community. On the other hand, another task of the public relations department is event organization which is more than anything a matter of imagination and creativity. As mentioned earlier this is an excellent way to reach out to the community.

As far as participation in *tourism fairs and other specialized exhibitions* is concerned, they are a must for big hotels, whereas for small independent hotels, each attendance must be carefully analyzed financial-wise. The goal of these fairs is to provide a hotel or company with the opportunity to make itself visible to the world, to reach out to potential clients and also to find out what advantages rival companies might have over them.

Sponsorships are another great opportunity to make the hotel visible to the public. The sports phenomenon has reached great heights of popularity. Depending on the financial possibilities of each company, it is important to be present in as many types of sports as possible.

Sponsorship refers to a contract signed between a company and the managers of different teams or individual players of a sport. This contract obligates the company to give determined amounts of money to that particular team or player in exchange of publicity and visibility for the company. There are some ways in which this publicity can be accomplished. For example the company name or logo can appear on the shirts or sports gear of football, basketball or soccer teams, or on the outfits of very popular tennis players, also large billboards with the company brand can be placed for everyone to see, announcers can mention the name of the sponsor during breaks etc. The idea is that the name of the company or the hotel is mentioned. And given the large number of people attending these games, the exposure will prove valuable.

3. STAFF BEHAVIOR

The services offered to tourists is a combination of two components: a *quantitative component*, evaluated on an objective basis, and a *qualitative component*, which is behavioral. *The quantitative component* is easier to define, to measure, to compare and become aware of. The basic elements of this component are technical equipment, food, design, working methods, routine tasks, the number of employees, the information etc. *The behavioral component* is mostly neglected by hotel owners. Even in trainings the focus is on working methods and routine tasks. Usually it is believed that a service cannot be appreciated in a positive way with a poor quantitative component. At the same time, the quantitative component on its own can only leave a neutral impression on the client. For example, positive comments about a clean restaurant with swift service are rare; on the contrary, while bad service or a dirty tablecloth will often cause complaints from customers.

Still, a solid behavioral component might be able to make tourists overlook quantitative failures. An adequate and professional behavior such as a sincere smile and special attention, for example, might counteract certain quantitative component flaws. Therefore, in the tourist-staff relation, staff behavior and attitude, their way of acting and reacting represent the essential criteria for appreciating the quality of the service as a whole, i.e. the element which generates customer satisfaction. The members of the staff who liaise with the guests (front office staff, such as: receptionists, concierges, waiters, bartenders etc.), must adopt a professional attitude at the workplace. By becoming familiar with the hotel offer and through their friendly and polite attitude, front desk employees will be able to recommend different services to guests, simply to greet them politely and, thereby, win their trust. The main rules of professional behavior refer to: polite greeting, adequate posture, a clean uniform, pleasant conversation (including phone interaction), professional gestures, etc. All potential "sellers" in the hotel must be properly motivated and master both verbal and non-verbal language skills. The use of facial expressions, gestures and body language (upright position, arms extended with the palms oriented upwards, eye contact) are of great importance when working or addressing guests. In Abraham Maslow's motivational pyramid, the need for esteem and recognition is placed on a superior level and by showing respect and concern, the staff is actually satisfying this need.

Similarly, this need for recognition impacts the intra-staff community relationships. This will not only create a positive workplace atmosphere, but also stimulate good team work, increase mutual trust, motivation, job and personal satisfaction. All these will further maintain a general professional good disposition of the staff. In addition, the customer or the tourist will acquire a reassuring feeling concerning a good collaboration of the establishment. The impression

created by an attitude like: "I am not serving at this table. It is my colleague's responsibility and I have nothing to do with it." will definitely be negative and the consequences will immediately show. Clients value the intervention of employees who do their best to fix an error or an inconvenience caused by someone else, and appreciate the teamwork spirit that derives from such attitudes. In turn, the colleagues and even the manager will appreciate the help given through this intervention which will satisfy his need for recognition and esteem. The forms of recognition depend on the job held or performed in the company. For example, the receptionist will receive appraisals for maintaining a good atmosphere, the supplier will be valued for respecting the deadlines, the manager is appreciated for the trust he invests in his employees, subordinates are shown appreciation by gradually being given more responsibilities. All mechanisms in a hotel, especially in a very good one, must be kept under permanent control and every effort must be made to maintain a harmony between them so as to ensure efficiency and thereby success to the company.

4. CONCLUSION

The 'hidden language' of the hotel industry is a complex construct of elements which are inherent to several areas of tourism, such as: communication, advertising, PR, marketing, sociology etc. The concept of 'hidden language' represents a restricted and personal approach to tourism practices which can be used both by theorists and practitioners, and may be beneficial to all parties involved in the tourism sector: the customer, the manager or business owner and the employee.

The hidden language contains communication elements which are not necessarily tangible to customers, but which contribute to the process of attracting tourists towards a product, i.e. a hotel or various services. It acquires different forms and can be included in groups, such as: *preliminary or pre-opening forms*, opening or market launch, and post-opening forms. The first group consists of: classification, street posts, illuminated trade signs, exterior and interior design, advertising, publicity elements, sales promotion, PR, personal sale devices, direct marketing elements. The second group, that of *hotel opening forms* of hidden language incorporates: local and national notoriety-building devices and strategies, while *post-opening forms* have to do with: national notoriety-enhancing devices international image building devices, to which participation in fairs and exhibitions and sponsorship attracting strategies are used.

It should be concluded, however, that all the mentioned forms of hidden language are crucial for ensuring a successful run to a hotel or a tourism business and that awareness of them increases the chances of success.

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BÂRSANA MONASTERY, A GEM AMONG THE WOODEN BUILDINGS OF MARAMUREŞ, ROMANIA

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ABSTRACT. – Bârsana Monastery, a Gem among the Wooden Buildings of Maramureş, Romania. Bârsana monastery was reestablished after the fall of Romanian communism, emphasizing the art of woodcraft in the „Country of Maramureş". Through the great number and originality of its pieces, all wooden, the Bârsana complex is the most representative and the most valuable site of its kind in Romania.

Keywords: *Romania, Maramureş, Bârsana, wooden monastery.*

1. GENERAL ASPECTS

The Bârsana complex represents an element of Orthodoxy, built out of wood, as a symbol and synthesis of the wood craftsmanship in Maramureş. "*Wooden churches are things of humility, taken from the root of the tree of God, well anchored in the earth, strong, which ascend to Heaven and reach God, from where the blessing returns to earth through the church's tower, while we receive it on our knees, praying, on the porch which is identical to that of a house*" (http://www.manastireabarsana.ro/01prezentare-manastiri.html).

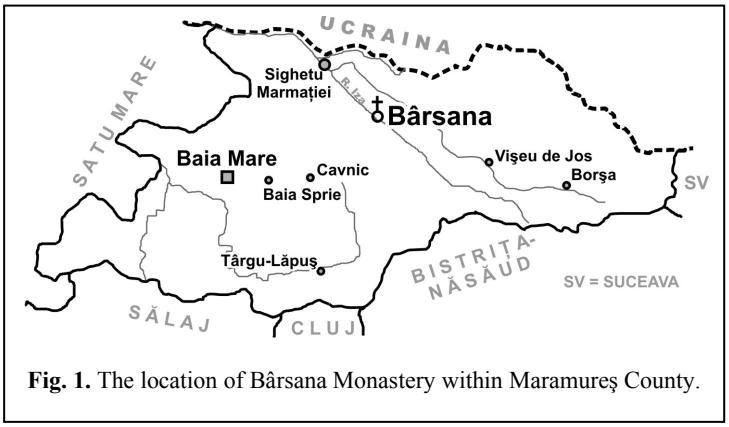

Fig. 1. The location of Bârsana Monastery within Maramureş County.

The construction of the monastery began in 1993 and still continues to this day, by setting up new additional spaces (parking lots, sleeping quarters, etc.). Bârsana monastery is a first tier touristic site in Maramureş, being easily accessible by the 186 county road from Sighetu Marmației. It is suitable for transit tourism and of course for religious pilgrimage, being harmoniously integrated in the local landscape. There are several sleeping quarters, which satisfy all the needs of these types of tourism.

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2. THE COMPONENTS OF THE MONASTERY COMPLEX

As one can see from the plan of the monastery, it has 18 components which are grouped in an orderly and harmonious fashion. The monastery's church represents the main element of the complex, around which the other additional components revolve, each with a specific function and utility.

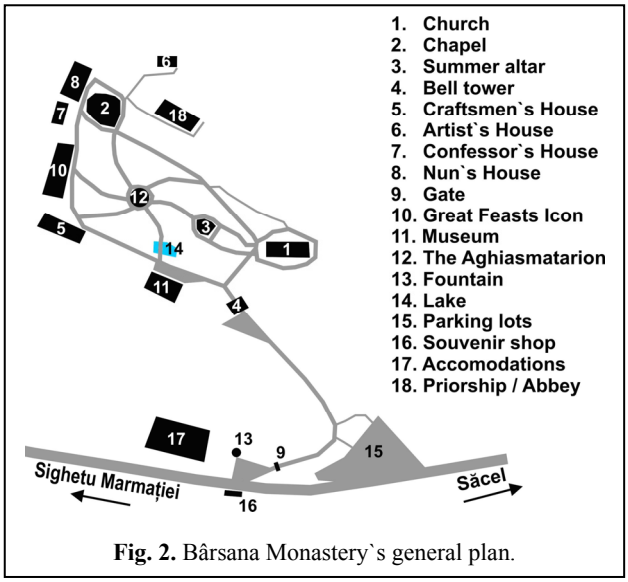

Fig. 2. Bârsana Monastery`s general plan.

The church of the monastery (construction period: 1993-1999) is situated in the eastern part of the complex, being used for religious service. It is the spiritual centre as well as the compositional centre of the entire complex. It was designed with the following dimensions: 22.57 meters in length, 12.20 meters in width and 57 meters in height, being one of the tallest wooden buildings in Europe. The building has two stories: the basement and the ground floor. The basement houses the initial church, has only one entrance and it is lighted through 12 small windows, also containing the "paraclis". The altar is separated from the rest of the chamber by a wooden rood screen, sculpted in traditional "Maramureşean" fashion. The ceiling is held up by four concrete columns. The basement is built out of reinforced concrete, with thick walls, clad on the outside in stone and in frescos (on the inside) designed and painted by Ioan Botiş. The main church is on the ground floor, has a club shape, with two diagonal niches.

The church contains all the characteristics of an Orthodox place of worship: porch, "pronaos", "naos" and altar. The porch is made of oak wood with carvings typical of "Maramureşean" art. The porch can be accessed through two side staircases. The tower is placed above the "pronaos" and has a very elongated shape. The fir shingle roof, built in a "sparrow-tail" style, has double eaves and forms a true wooden lace. The iron cross, 7 meters in height and weighing 500 kg, have been lifted on top of the church on a Thursday, 10th August 1995. Now, the church awaits its painter to finish the traditional picture "coat".

The Priorship / The Abbey (construction period: 1995-1996) is a multistory construction of great architectural beauty, a remarkable creative example of traditional architecture. It holds the south-western part of the complex and has four stories: basement, ground floor, first story and attic. The basement is made of reinforced concrete, with 40 cm thick walls, clad on the outside in stone. The ground floor has three entrances: one from the east, one from the north and one from the west. It also has four terraces that front all the main cardinal directions. One can reach the eastern terrace by two staircases. Here is the main entrance through which you reach a hallway. This hallway connects with the hallway from the northern entrance. From the hallway, one can reach the office and the kitchen. On the first floor there are several cells, the library and the chapel, which goes all the way to the attic. The attic also contains cells and a reading room. The roof is made of fir shingle in the same style as that of the church.

"The Summer Altar" (construction period: 1996-1997) is situated at the centre of the monastery premises and holds the holy services on Sundays and on holidays during the warm season, as well as other major services. The summer altar is the architectural element around which the whole complex pivots. It is a relatively new architectural element that continues the theme of traditional architecture, typical for Maramureş. Continuing the art of carving wood through local craftsmen, added to a modern canvas, this work managed to become a space of meditation, in which the past connects to the future. The foundation is made of concrete and it is clad in stone. It has a octogonal form with a diagonal of 8 meters and a height of 20 meters, being "crowned" by a wooden dome, supported by two squares, 45 degrees from the main axis. The framework is made of fir wood, while the cover from clapboard.

Fig. 3. The church.
(**Source**: http://www.manastireabarsana.ro/).

The bell and the bell tower (construction period: 1998) are situated in the south-eastern part of the monastery complex. Under the tower`s large dome there is an entrance inside the monastery`s premises. The front arch of the dome bears the biblical inscription "*This is the house of God, this is the house of Heaven*" (Genesis 28, 17). On the left side of the bell tower there is a bookshop, while on the right there is a staircase, going up to the bells. The tower, due to its height and grandeur, due to its arch, makes a lasting impression on the pilgrims that come to the monastery; it creates emotions, devoutness, instills in people souls the fact that, going through this entrance, one enters a sacred space. The tower, the balcony, the cross and the roof are all in perfect harmony with the other elements in the monastery complex.

"The Craftsmen`s House" is a building that houses the craftsmen`s workshops, being situated in the south-western part of the monastery. Its purpose is one of production, since it houses several workshops, at the first ground floor as well as at the first floor. The foundations are continuous, out of concrete, the elevation being made of reinforced concrete and clad in stone on the outside. The walls of the ground floor are made of cement, while the second floor is made of oak wood. The framework is made of fir wood with clapboard covers.

"The Artist`s House" was built in the northern part of the complex and a little bit up the hill, the access being a flight of stairs. It can house people with creative, artistic, preoccupations. The house stands on a concrete foundation, clad in stone on the outside, and has two wooden stories. The ground floor has a front terrace, from which one can enter a hallway and from there into three separate rooms: a bedroom, a bathroom and a living-room.

"The Confessor`s House" (construction period: 1998) was also built considering the fact that every monastery needs a confessor. It is situated in the western part of the complex. In front of it there is a terrace, while inside there are one hallway and three rooms.

"The Nuns` House" is on the north-western part of the monastery complex and has three stories: basement, ground floor and first floor. The basement contains a storage facility and a power generator, while the next two floors contain cells. The house also has terraces adorned with flowers.

"The Gate" is situated on the road that diverts from the DJ 186 road. Here, local craftsmen erected a typical wooden gate, which symbolizes an entrance into a sacred place, due to the fact that it has a cross carved into it.

Fig. 4. The House of the Great Feasts Icon. (**Source**: http://www.manastireabarsana.ro/).

"The House of the Great Feasts Icon" has three levels, being situated in the western part of the complex. The basement houses garages and storage units. The ground floor contains the kitchen, the pantry and the laundry room, while on the first floor there is a very large open terrace.

"The Gavril de Bârsana Icon Museum and Bookshop" was erected due to the growing number of pilgrims and tourists that are attracted by the traditions and the beauty of the Iza Valley. The museum is situated in the south-western part of the monastery, near the bell tower. Being an objective meant for tourists and pilgrims, it is situated so as to have a direct connection to the access route into the monastery and in order not to disturb the religious activities of the monastery. The architectural concept is based on the attempt to fully utilize the traditional architecture of the area and to integrate the building into the site. The museum is a building structured on three stories. The basement and the ground floor are built on a structure of brick walls and also reinforced concrete, while the first floor is made of wood. The interior is dominated by a large space that goes all the way to the top of the building. The project encompasses spaces for exhibiting icons and books at the ground floor, but also workshops for weaving, icon making at the basement level, while the first floor contains ethnographical exhibits.

All these spaces are built in such a manner that they resemble the image of a peasant`s house from Maramureş, the furniture and all the woodwork being inspired from the local villages. The museum also has a place of rest and meditation. The access to the upper floor is done by using two symetrical fights of stairs. The museum owns scrolls, religious texts and books of great value from the 16^{th}-19^{th} centuries, old icons and a rich collection of traditional art, all these exhibits giving the museum a great spiritual value.

„The Aghiasmatarion" completes the monastery complex, having a central position within the complex. It has four entrances with a fountain in the middle. This resembles the additional constructions next to the Paleochristian churches where the holy water was being held. One can reach this construction by paved alleyways. It has a surface of 32 m^2 and a height of 9 meters, the floor being made of andesite. The parking lot and the souvenir shop are situated at the monastery`s entrance.

The sleeping quarters are comprised of the Bârsana Villa, with 54 places: three apartments with four places, three apartments with three places and 16 double rooms. The food being served to the guests is cooked by the nuns within the monastery`s compound, according to the traditional dishes of Maramureş.

3. INSTEAD OF CONCLUSIONS...

The Bârsana Monastery complex is the most representative religious site of Maramureş and represents a synthesis of the superb wood craftsmanship of local men, granting it great touristic potential. The monastery can be visited all year long, having sleeping quarters ready to house the visitors.

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NICOLAE DRAGOMIR (1890-1982) – A RIGHTFUL REDEMPTION

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ABSTRACT. – Nicolae Dragomir (1890-1982) – a rightful redemption. If in the period filled with sad memories, which Romania has gone through between 1947-1990, great personalities were deliberately concealed and removed from various fields, in 1989 a process of recovering the real values started; geographer Nicolae Dragomir belongs to this category. My undertaking joins this effort with the goal of recovering the biography and work of Professor Nicolae Dragomir, who is an outstanding representative of the Cluj school and who concerned himself, to the smallest detail, with the pastoral life of the shepherds from Mărginimea Sibiului, from which he himself descends. Briefly, I intend to outline the human moral and scientific profile of Professor Nicolae Dragomir, based on his biography and work.

Keywords*: sheep husbandry, the sociological school, Mărginimea Sibiului, the shepherds' roads, transhumance, shepherds from Mărginimea Sibiului in Dobrogea and in the south of the Danube, in Bessarabia, in Crimea, in Caucasus, the decline of sheep husbandry.*

1. INTRODUCTION

In the gallery of Romanian geographers and ethnologists, a particular figure as a disciple and member of the Cluj School of Geography is represented by Nicolae Dragomir, who occupied himself with one of the traditional activities of our peasants – ***sheep husbandry***, namely of the shepherds from the Mărginimea Sibiului area. His works are as valuable as the ones of Sabin Opreanu, Nicolae M. Popp, Mara Popp, Laurian Someşan, Tiberiu Morariu and others, joining what was desired to be achieved, namely an encyclopedia of the Romanian village universe, in the spirit of the sociological school of Dimitrie Gusti.

Nicolae Dragomir (1890-1982)

Convinced of the scientific value of Nicolae Dragomir's work, I was unpleasantly surprised to find out that he was not even mentioned in the books devoted to the personalities from Cluj, respectively in "*Personalities of the Twentieth Century from Cluj"* (Cluj-Napoca, 2000), "*Personalities from Cluj (1800-2007): Illustrated Dictionary*" (Cluj-Napoca, 2007) where, by the way, there is too much printed space given to "personalities" which do not matter as much! I have not found him in the "*Romanian Dictionary of Ethnologists"* (Bucharest, 2006), Third Edition, too pretentiously subtitled "revised and enlarged" either and neither in "*Romanian Geographers"* (Bucharest, 2000),

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which is proof that these works were written hastefully. I ought to mention that his works were still occasionally cited, the most recent being those of Professor Grigor Pop in the study "*The Transylvanian Depression*" (Cluj-Napoca, 2001, p. 70-71) and of the subscriber of these words in "*Foray into the Memory of Places*" (Cluj-Napoca, 2007).

The biography and the work of Professor Nicolae Dragomir must be promptly brought to our biographical and scientific heritage; my undertaking is dedicated to him as a reverential gesture, both recuperatory and reparatory.

2. BIOGRAPHICAL REFERENCE POINTS

Nicolae Dragomir was born on November 10, 1890 in the village of **Vale**, in the commune of Sălişte from Mărginimea Sibiului, in a family of middle peasants. He was the youngest child of four children of Maria and Maniu Dragomir.

Starting at age five, he attended the primary school in his native village, then the one in Sălişte. Afterwards, his parents enrolled him in the Hungarian State School from Sibiu, whose courses he completed in 1911, with the maturity exam.

Having a more difficult financial situation, his parents insisted on him following the priestly career and thus, they enrolled him in the Andrean Seminary from Sibiu (1911). In his third year, he enrolled in the Normal School from Sibiu also, giving all his exams, so that in 1914, he graduated from both schools, becoming a teacher at the same time, as he had intended in the beginning.

When World War I began, due to the fact that he was exempt from military service as a priest, he got a job by contest as a teacher at the Confessional Elementary School in Geoagiu de Sus (Alba County), where he functioned until 1919. There he made an apostolate work, being the only teacher of 139 students, working with six groups of students simultaneously. He would later remember and write about those circumstances in a few pages which exist in the manuscript: "*I managed however to get them to love school, even though we did not have an adequate room, nor enough desks; most of the students would sit on the floor, where they would find little room and they would write holding the tablets on their arms*".

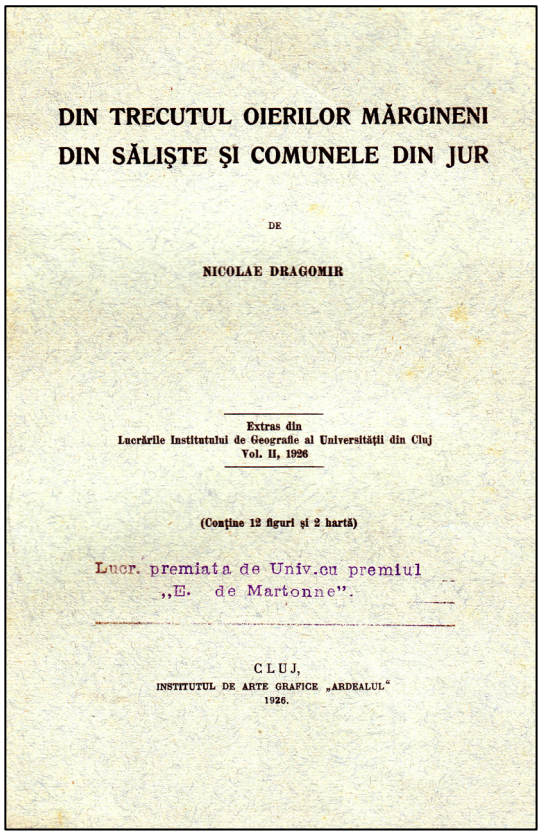
After the war, before he left his first position, in the summer of 1919, he organised a trip to Sibiu for 35 students, on which occasion they visited the headquarters of the Directing Council, which held its activity there.

Starting in 1919, he completed his studies through courses for teachers at the Dacia Superior University from Cluj. In autumn he was appointed professor and interim principal at the Mixed Civil School from Hunedoara, which he had to set up (there was another Hungarian school). With great efforts and some delay due to the inherent post-war financial difficulties (initially, the school was funded solely by donations), on the 2nd of February 1920, he had a festive inauguration of the Romanian School in Hunedoara along with the students, parents and local authorities.

In the autumn of 1920, in order to be closer to his parents, he asked for a transfer to Sibiu, but he was directed to Deva, at Decebal Highschool, where he functioned as professor of Geography until 1929. Here, besides his teaching job, he has developed a serious and thorough scientific research, crowned with his publishing debut at the prestigious publication of the Geography School from Cluj "*The Studies of the Institute of Geography at the University in Cluj*" where, in the second volume (1926) he published the study "*From the past of the shepherds from Mărginimea Sibiului, from Sălişte and from the surrounding communes*"

(p. 195-257), with a summary in French, five boards of photographs and a synthetic map of great complexity entitled "*The roads to the places for spending the winter of the shepherds from Sălişte (Mărginimea Sibiului) in the mid-nineteenth century*", drawn after a laborious investigation "*based on the shepherds' stories*", as he himself declared. His study was also noticed by the famous French geographer Emmanuel de Martonne (1873-1955), who awarded and congratulated him personally, urging him to continue his research.

It is important to know that this study has won the first award, appointed by the French scientist in Cluj, Nicolae Dragomir writing in his manuscript notes: "*the study was awarded the Emmanuel de Martonne award by the University in Cluj, at his very proposal, him being in Cluj at that time and was especially acclaimed by the Congress of Geography Professors from Brussels and laudatorily reviewed in the "**Geographical Review**" from New York. At the same time, I was invited to become a member of "**The American Geographical Society**".*



DIN TRECUTUL OIERILOR MĂRGINENI
DIN SĂLIŞTE ŞI COMUNELE DIN JUR

DE

NICOLAE DRAGOMIR

Extras din
Lucrările Institutului de Geografie al Universităţii din Cluj
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(Conţine 12 figuri şi 2 hartă)

Lucr. premiata de Univ.cu premiul
„E. de Martonne".

CLUJ,
INSTITUTUL DE ARTE GRAFICE „ARDEALUL"
1926.

Along with teaching, research and publication, Professor Nicolae Dragomir held a sustained work in Deva with young scouts, related to the general endeavour for the prosperity of the country and for the shaping of the new generation.

In 1929, he transferred to the Pedadogy School for boys in Cluj, where he functioned for two years. In the same period, in 1931, he received his Bachelor's degree in Geography-History with distinction and was immediately appointed lecturer at the Institute of Geography instead of assistant Aurelian Florinescu, after he had been temporarily appointed assistant in 1930.

He functioned at the institute for only three years, until 1933, when his position was abolished by the ministry due to the budget austerity which followed the economic crisis (1929-1933). A great team of teachers and researchers had been built-up at the Institute of Geography, such as George Vâlsan, Vasile Meruţiu, Laurian Someşan, Sabin Opreanu, Fabiu Dumbravă, Alexandrina Haţieganu, Tiberiu Morariu, Radu Meruţiu, Romulus Vuia, Aurelian Florinescu, the one who was replaced by Nicolae Dragomir. In time, only Tiberiu Morariu managed to endure the changes of the new world from after 1947. The other ones were removed from higher education teaching, more or less honorably.

At the Institute of Geography, which belonged to the Faculty of Science, he became friends with Professor Ioan Maxim from Geology, with whom he undertook field investigations.

The years after 1930 were the most prolific of Professor Nicolae Dragomir's life on all levels. Regarding his professional life, after extensive research on a large scale, he published two studies. These are "*The shepherds from Mărginimea Sibiului in Bessarabia, Caucasus, Crimea and North America*" published in the sixth volume (1938) in "*The Studies of the Institute of Geography at the University in Cluj*", p. 159-302, with a summary in French, six complex maps (boards I-VI) and a series of images and photographs (boards VII-X), study which was awarded the "George Vâlsan" award in 1941, and "*The shepherds from Mărginimea Sibiului and their transhumance to South Dobrogea*" published in "*The Annals of Dobrogea*", at Cernăuți in 1938 (the XIX year of the review), p. 121-137, with the map "*The road of the sheep towards the place for spending the winter*".

In 1938, when the position of professor of Geography at George Barițiu High School in Cluj became vacant, he moved there, operating until 1940, when he was forced to take refuge in Sibiu.

Being economical and hard-working, Professor Dragomir bought in 1933 some land from the ones sold by the town hall of Cluj, in the area which would later become the "Andrei Mureşanu" neighborhood and between 1933-1935, he built a beautiful house in the Neo-Romanian style.

In terms of building a family, Professor Dragomir fulfilled himself by marrying Professor Sofia Moraru in 1937, having three children together: Sorin (1938), Mircea (1939) and Viorel (1943), the youngest, born in Sibiu, because after surrendering large territories from Transylvania, Crişana and Maramureş, the Hungarian authorities have asked the Professor to leave his residence from the town on Someşul Mic in 24 hours.

Between 1940-1945 he took refuge in Sibiu, where Professor Dragomir functioned at Gheorghe Lazăr High School, completing the school department at the Normal School for boys, where once he was a student and later, he functioned at the Pedagogy Seminary also. In this period, in June 1941, he was awarded the "George Vâlsan" award of the Romanian Academy, worth 15.000 lei, which he received from the hands of its Secretary General, Alexandru Lapedatu.

In 1945, he came back from refuge with his family to his residence and to his position at the Barițiu High School, where he had a full-time teaching job and functioned "normally" for two years, until 1947, when the Great Purge began in force by removing the valuable teachers, with their "bourgeois" and national education from teaching. Starting with the autumn of 1947, a long series of successive transfers began for Professor Dragomir: to the School of Pedagogy for girls, the CFR Technical Secondary School, the Technical Leather Making Secondary School, then for seven years to Bob School, from which he retired in 1953 after a career of 39 years, with a pension of 560 lei. Due to the fact he had a young family – he had married late, his children were still in school – he made a request which was approved (how kindly!) to function as an educator and secretary at the Technical Leather Making Secondary School where he worked for another 9 years, until 1962, when he retired for good and received a final pension of 955 lei after a career of 48 years.

God rewarded Professor Nicolae Dragomir with a beautiful life of 92 years; on 1st April 1982, he died at his residence in Nicolae Iorga Street, no. 25.

Relatively small in stature, with a soft voice and gentle character, but very active and lively, his bright figure will last over time through his three sons "tall as trees", as he enjoyed saying and through his grandchildren. Also, his scientific work dedicated to the shepherds from Mărginimea Sibiului, from whom he descended, will remain perennial, having an unalterable value.

As a high school teacher, he honoured his teaching job with great dedication, being a part of the magnificent gallery of high school teachers of the interwar Romania, where the selection – which was open for everybody – was rigorous, and promotion was based on merit, not on the game of influence pedding. After the war, the University has missed the chance of calling Professor Dragomir back, losing a valuable element, but at the dawn of the new world which was arising, another sort of people were needed...

3. GEOGRAPHICAL WORK

Nicolae Dragomir's studies are in the field of human geography, with obvious ethnographic emphasis sparsely, as discussed in the classic French school of human geography – in fact, Professor Emmanuel de Martonne noticed, encouraged and congratulated him – his studies being focused on the sheep husbandry practiced in Mărginimea Sibiului.

At the advice of his mentor, Professor George Vâlsan, who he necessarily wanted to mention, young Dragomir began an extensive campaign of inquiry and investigation on "sheep husbandry in Mărginimea Sibiului". In his first study, he recorded: „I believe it is my duty to mention that this study was initiated at the advice of Professor George Vâlsan, who, aiming at a systematic study of the Carpathians from a geographical point of view, dictated to me and my colleagues since 1920, a detailed plan for a pastoral monograph, drawing our attention to the problems regarding geography, such as the fairs in the heights, life in huts and pounded areas, the shepherding road map etc." (1926, *op. cit.*, p. 252). Following this advice, after lengthy research on site from which he assembled immense material, Nicolae Dragomir synthesised and prepared his first study, later augmented with other two, all of these studies forming a whole and exhausting the subject of "sheep husbandry in Mărginimea Sibiului", being a model of comprehensive approach. To this day, despite the time gone by, the value of his scientific studies remains unaltered, successfully passing the test of time, whose marching enhances the documentary value of his work. This situates Nicolae Dragomir on the same level with geographers such as Nicolae Popp, Mara Popp, Laurian Someşan and Tiberiu Morariu who studied Romanian sheep husbandry in relation to different regions of Romania, whether the shepherds from Bran, Săcele, Bratca, Monor (from the Călimani Mountains area) or from Maramureş.

The favourable physical-geographical conditions for a pastoral life and activity in the region of "Margine, Mărginime or Mărginenime" in the county of Sibiu, in the foothills of Cândrel Mountains, have directed the people to practice sheep husbandry and to develop "the economy of cattle". Here is how the author summarises the favourable conditions: "the less rewarding soil compared to the harder work of the land, on one hand, and on the other hand, its more gentle forms of relief, placed at different heights, stepwise: low, between 500-600 m, the «*Border*», with rich meadows and pastures for winter; higher, between 1000-1300 m, the «*Forests*», great places for meadows and pastures in autumn and spring; and highest, the «*Mountains*» widened in the shape of large bridges without steeps, with a rather mild climate and rich in water and grass to the top, has determined them to exclusively devote themselves to this occupation, which they developed so thoroughly that they remained unsurpassed among the other shepherds from Romania" (1938[2], *op. cit.*, p. 12).

In the meaning of the word "mărginime", the author includes the strip of land that stretches along the Carpathian ridge, but the toponym "Margine, Mărginime or Mărginenime" has a much narrower scope: "Mărginimea, the true Mărginime, with its limits set by those who inhabit it is much smaller. It is confined, almost enigmatically, only to a few villages grouped

around a center, refusing others, which are located on the same strip and in close proximity (1938[1], *op. cit.*, p. 159), being the "strip of territory around Sălişte, which consists of 13 communes". Its limits would be the Carpathian ridge to the south and in the north, the "Great Road" beyond which "there are no more people from Mărginimea Sibiului, only people of the plains, people from the center, who are special in many ways" (ibidem, p. 160). Therefore, "the name of «mărgineni» is given only to the villages of shepherds who practiced transhumance", indicating "the occupation, more than the establishment" (*idem*), the villages that form Mărginimea being: Sălişte, Galeş, Tilişca, Rod, Poiana, Jina, Vale, Sibiel, Cacova, Săcel, Orlat, Gura-Râului and Răşinari. These settlements are "strung" on the contact line between the hills and the mountains, "a happy circumstance" which affected through the physical characteristics of the earth "not only the physical body and the mental attitude of the people", but at the same time, it "persuaded them to a certain occupation, which they developed so thoroughly and practiced on such a large area, that they remained unsurpassed in the history of sheep husbandry" (*idem*).

In the 18th century and first half of the 19th century, "when sheep husbandry lived its golden age", the people from Mărginimea Sibiului were "in constant motion from the lowlands to the mountains and vice versa" (1926, *op. cit.*, p. 196). The constant motion mountain-valley (plain), from villages to the huts up in the mountains, of small spatial extent, was replaced with a larger oscillation, mountain-lowlands, away from the heavy winters, from Lunca Dunării, the Historical Dobrogea, including its valleys "without winter", to the Mountains of Moldavia, followed afterwards by the expansion of the sheep husbandry to the east, in Bessarabia, Crimea and Caucasus.

The calendar of the oscillations, the activities characteristic for sheep husbandry, the organisation of the sheepfold, the roads followed by the shepherds from Mărginimea Sibiului are described in short chapters, of 2-3 pages, such as: the departure to the sheep festival, the shepherds' roads, breeds of sheep, the marking of sheep, the sheepfold and the shepherds, the wages, making cheese, pastoral festivals and others.

When describing places, activities, highlighting toponymy, etc., all a result of thorough investigations that he made – the author recorded the name, age, profession and residence of those interviewed – the storytelling talent of the author, the critical and selective observation, the capacity of synthesis and connecting with other sciences (history, ethnography) stand out, all of these resulting in some memorable pages; some of them I will cite myself.

"**The passage in Dobrogea**" of the shepherds from Mărginimea Sibiului happened shortly "after they started going to the Pond" (1926, *op. cit.*, p. 235), after the Peace of Passarowitz (1718)?, asks the author. There were crossing points in Giurgiu, Oltenița and Călăraşi with kayaks – "moveable bridges", sometimes they would also use fixed bridges or pontoons built by Russians because of the frequent conflicts with the Ottomans, as it happened in 1854 in Giurgiu.

After 1877, "they passed much faster because they would tie the kayaks – which supported up to 1000 sheep – to a little ship; thus, in 1881, 47000 sheep passed through the port of Călăraşi in a single day!

Before 1877, they would pay the tax charged for grazing cattle to the Ottoman officials, who were not too rigorous, getting in return the "chiştireaua", a document based on which they could graze freely. Once they passed in Dobrogea, "the shepherds would disperse to wherever they wanted: some towards Tulcea, other to Constanța or Mangalia, the best places being considered to be around Bazargic in Deliorman, the valleys of Batova and Balcic, reaching even Şumla and Varna (*ibidem*, p. 236). The observations about the toponymy are very interesting

because the shepherds from Mărginimea Sibiului would name the villages after a series of dominant features, such as: "At the poplars", "The village with the Turkish mayor", "The well in the hill", "The village with windmills", "The garbage village", "The village with many wells", "The village with cannons" or "The village from the crash" (*ibidem*, p. 238). We also learn, transmitted by the oral tradition of the shepherds that "close after Rusciuc (Ruse, s.n.) most of the villages were Romanian, such as Turtucaia and below Silistra and Popina, they were almost purely Romanian […]. The shepherds' tradition says that in the old times all the villages surrounding Rusciuc were inhabited by Romanians, but Bulgarians slowly came in" (*ibidem*, p. 237).

In their transhumance, while "looking for places without winter", the shepherds from Mărginimea Sibiului did not limit themselves to the Romanian Dobrogea, but "they went down and south, getting into the entire north of the Balkan Peninsula, where they would meet Aromanian shepherds, their brothers in the Romanian-speaking latin family, the "*scutar*" (the leader of the sheepfold, s.n.) from Mărginimea Sibiului shaking hands with the Aromanian "*celnic*". There were crossing points in the Lower Danube region at Bechet, Turnu Măgurele, Giurgiu, Oltenița, Călărași, Silistra and Hârșova (1938[2], *op. cit.*, pp. 130-131).

In **Bessarabia**, "the shepherds from Mărginimea Sibiului arrived after 1870-1880" knowing "its abundant pastures before their travels towards finding places for spending the winter" and "until 1812, no one would hinder them from crossing the Prut, because there was only one Moldavia from the mountains to the sea and to the Dniester (1938[1], *op. cit*., p. 211). After Bessarabia became a Russian province, the tsarist authorities have encouraged the Transylvanian shepherds to graze their flocks there, as evidenced, in addition to oral history, by the Russian maps from 1836-1852, which "show many Romanian sheepfolds in Southern Bessarabia" and by the Austrian consul's accounts from 1813-1815 sent to Chancellor Metternich. After 1870-1880, Bessarabia became "the only place where sheep husbandry could be practiced freely. The number of sheepfolds increased so rapidly that when World War I began, Bessarabia became what Dobrogea used to be: a huge sheepfold of shepherds" (*ibidem*, p. 212).

In **Crimea-"Crâm"** the shepherds from Mărginimea Sibiului arrived because of the frequent droughts followed by heavy winters from Bessarabia and Dobrogea, as well as because of the declining prices of sheep and their products, attracted by the "breadth" of the space, because "after their passage in Bessarabia, obviously, sheep husbandry became so popular that the territory of Bessarabia was not big enough" (*ibidem*, p. 221).

The shepherding life in Crimea was not stationary as it was in Bessarabia, but it was the same oscillating movement between mountain and lowlands as in the Romanian Land from the Carpathians to the Pond and/or to Dobrogea, but "it was not as big, nor as great" (*ibidem*, p. 230).

At one point, "because the sheep multiplied too much, Crimea became overcrowded and the shepherds had to search for new places" (*ibidem*, p. 252). Thus, the shepherds from Mărginimea Sibiului spread in the **Caucasus**, which "offered very favourable conditions for sheep husbandry, because it gave them the breadth they were looking for and cheap land: 1 deseatina (Russian unit of area for measuring land, equal to 1.09 hectare, s.n.) for the price of 10-20 kopecks in the beginning". The result was that in less than ten years the entire Caucasus was filled from out to out with the sheep from the sheepfolds of Mărginimea Sibiului (*ibidem*, p. 255). In the last years of its existence (1921-1930), "the sheep husbandry of Mărginimea Sibiului" in Russia – recorded Nicolae Dragomir – has gone through great crises which have not only stopped the momentum it has taken, but weakened it much and then completely destroyed it (*ibidem*, p. 263).

The few survivors of the Soviet paradise who were able to return home during the years 1934-1935 reported to the author that the Soviet authorities stripped the shepherds from Mărginimea Sibiului of a total of about 5 million dollars, equivalent to about 1 billion lei in "their persecution for gold". There are whole pages of disturbing evidence about the communist oppression; I believe that at the time when the study was published – the year 1938, the most flourishing year for Romania from an economical point of view under the reign of King Carol II, it was a warning on the methods of the society communisation practiced by a bunch of opportunists. The method was applied in exactly the same way one decade later, when the abundant Kingdom of Romania entered the Soviet sphere of influence and has experienced the same "revolutionary transformations".

Let us consider the pastoral festivals, in whose description Nicolae Dragomir proves to be a complex geographer and, moreover, one with real literary qualities. In his view, they "have a national role as the ancient Greek olympic games or the Arabian markets", but "on a lesser scale" (1926, *op. cit.*, p. 212-214) because "even with all their trouble and the simple and poor lifestyle they led, the shepherds were always lively and cheerful, just as the nature surrounding them".

The pastoral festivals were held during the summer holidays: at Sânziene (24th June), St. Peter (29th June) and St. Elijah (20th July), "the most famous were the ones held at Sânziene in the Poiana Muierii (the Woman Glade), when nature would wear its most pompous robe, for all the flowers were blooming, when everything in the mountains would smile of holiday and life would be more enjoyable" (*idem*).

One or two weeks before the preparations began, "the secretive mountains with their profound life were starting to become noisier: the quiet mysterious warm evenings began to be more often interrupted by the shepherds' whistles and by the barking of dogs; the almost deserted roads were becoming alive, because more and more travellers and traders who came from afar walked on them, whose horses groaned under the burden of the goods they carried and the «faces» were increasingly crossed by the relays who hurried from sheepfold to sheepfold; the only stories that were told around the fires of the sheepfolds were those regarding the festivals of the mountains, to stir the shepherds and if they were there, the shepherdesses also, so that all the youth would enjoy the celebration of gladness" (*idem*).

Poiana Muierii (the Woman Glade) was a small platform, "a hidden ravine in the mountain ridge, which you can find only with difficulty and which, by its position, makes you expect something spectacular. It is a platform of unsurpassed beauty: it is horizontal, covered with tall, but soft grass, with a brook and a sheepfold nearby and - being located at a height of approximately 1700 m, an extension to the Solane, a peak that detaches itself from the Peter's Crest – which has broad views towards Frumoasa, but especially towards the Valley of Haţeg, where eyes are lost in the great distance. It is surrounded all around by pine trees and other beautiful glades, but somewhat lower, as a queen seated on her throne (*ibidem*, p. 213). Here, "the shepherds and the inhabitants that lived in the surroundings gathered to feast" (*idem*). They could not have picked a more suitable glade for such a festival of the mountains, which could be in a more perfect harmony with the joy the guests felt and manifested, brothers from two countries" (*idem*).

Early in the morning, the inhabitants that lived nearby started to come, "young and old", from Valea Jiului, Cimpa, Livezeni, Lonea, Petroşani, Jieţ, Lupeni, Petrila, "clothed with beautiful garments, and the women with their marvellous headwear, woven and embroidered by their own hands and very skillfully adjusted on their heads". Then, the shepherds and the shepherdesses would arrive "hurriedly, as flocks of birds", after they had finished milking

"clothed in black, simply, but cleanly"; thus, they came from Poenari, Jina, Şugag and even from Tilişca. "Almost at noon, people from the Kingdom would arrive, in groups of 20-30, men and women, from Novaci, Bengeşti, Voineasa, Baia and other communes near the mountains", and then "slowly, the youth would start dancing" which "continued until it was late in the night, when everybody would go home". Sometimes, fights would take place because "on the occasion of pastoral festivals matters of the heart were settled" as well as economical matters "when people would revenge the grazing violations" (*idem*).

The golden age of the sheep husbandry of Mărginimea Sibiului extended from the late 18th century until the first half of the 19th century, when it started to fall into decay due to many causes. Among the causes for the decay of the sheep husbandry, Nicolae Dragomir lists:

- "the openness to commerce of Bosphorus" after the Adrianopol Peace Treaty (1829), when the Romanian Principalities were able to trade, escaping the Ottoman monopoly. Thus, becoming profitable, the cereal cultivation began to be practiced on a growing scale, "the wide plains, which used to be covered only with grass until then, slowly began to be transformed in fields broken by the plow" (1938[1], *op. cit.*, p. 167), which meant reducing the grazing areas and hindering the roads to finding places for spending the winter;

- the shepherds practicing other occupations, which we nowadays call retraining, such as commerce or some jobs related to the products obtained from sheep: wool, milk and its derivative products, meat, tallow, agricultural tools, fabrics;

- the protectionist customs policies of the Austria-Hungary which annihilated trade profitability. Thus, if the traders from Mărginimea Sibiului "could not bring goods from Transylvania, they brought the factories, transforming a number of little towns such as Râmnicu Vâlcea, Caracal, Slatina, Târgu Jiu, Curtea de Argeş, Drăgăşani, Corabia, Piteşti and others into Romanian industrial centers" (*ibidem*, p. 184), the author offering us many examples of tanneries, leather factories, carpentries, workshops manufacturing ropes, candles, metalwork, wheels and others, developed on the capital of the former shepherds from Mărginimea Sibiului.

4. CONCLUSIONS

Even though it is not lengthy, the work of Nicolae Dragomir focused on the study of the pastoral life of the shepherds from Mărginimea Sibiului can be an example of a comprehensive approach on all sides of this issue. Mainly using field surveys, the author manages to give us in the smallest detail, the live mirror of "the pastoral life from Mărginimea Sibiului", as he called it. The roads of the shepherds, the organisation of the sheepfolds, the life at the sheepfold, shepherding in Dobrogea, in the south of the Danube, where the shepherds from Mărginimea Sibiului „met their Aromanian brothers", their passage in Bessarabia, and then in Crimea and Caucasus are all masterly described. The steps towards the communisation of the sheepfolds in Russia are masterfully depicted, as well as the struggles of the Romanian shepherds for survival and finally their "defeat", as a matter of fact the defeat of the relentless work, of the diligence on behalf of an egalitarian ideology, which represented a signal of danger for the well-developed Romanian society, part of the monarchical interwar Romania. From this point of view, he was a visionary!

If I am allowed, I may say that I feel a special personal satisfaction, managing to recover from obscurity by persistence the biography of this great geographer and to emphasise again his scientific work, so that I can invoke with full satisfaction the biblical dictum "he was lost, but now he is found"!

The "recovered" biography of this geographer is offered to the scientific community from various fields, emphasising his work at the same time. Also, the community of the city on Someşul Mic, "capital of Transylvania", as it desires to be, must know its true values, for only then it deserves the title it claims, its self-awareness acquiring more substance.

As this is a redeeming undertaking, I want to thank those who led me in the footsteps of Nicolae Dragomir: Professor Pop Grigor from the Faculty of Geography in Cluj, Mr. Ion Păculea from Vale village, Sibiu County, the venerable retired teacher Mrs. Zoe Dragomir from Vale village, who gave me valuable information about Dragomir family and Mr. Viorel Dragomir, the youngest son of Professor Dragomir who gave me to consult 7-8 pages with manuscript notes and the photograph of his father. To all these people I am thankful and I express all my gratitude.

Finally, let us give the word to Professor Nicolae Dragomir, who, concluding, describes the people of Mărginimea Sibiului as "one of the liveliest and most valuable elements of the Romanian people. They, by their paths trodden by the old times, not only contributed greatly to the unity of the Romanian soul and indicated the boundaries of a country with a golden future, Great Romania, but by their travels through «foreign countries», proved the intelligence, excellence, virtue, diligence and dignity of the Romanian people, whose sons they truly are" (1938[1], *op. cit.*, p. 294).

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IN MEMORIAM

PROFESSOR DR. DAVID TURNOCK (1938-2011), A PASSIONATE RESEARCHER OF THE ROMANIAN GEOGRAPHICAL SPACE

A tragic road accident (collision with another car) which took place on May 8, 2011, on the road from Leicester to London (A 47, in East Norton), led to the passing away of the reputed teacher and scientific researcher in the field of Human Geography from the Geography Department of the University of Leicester, United Kingdom, on May 10, 2011 (in hospital).

Of course, the news of the event saddened me very much, taking into consideration, among other things, a fruitful cooperation which has started in 1993 and continued until recently, that also led to the publication of several studies in collaboration[1].

The analysis of the personal data indicates that Professor D, Turnock, PhD, was born on August 19, 1938, in Wigan (Greater Manchester), United Kingdom, and was married to Marion. They have two sons, Graham and Andrew.

The first stage in its educational preparation took place in Wigan Grammar School, between 1949 and 1956. Then, between 1956 and 1964 he attended and graduated the high school, university and post-university studies, including the Ph.D., awarded at St. Catherine's College in Cambridge.

As a consequence of the excellent results obtained during the 15 years of educational and scientific preparation, in 1964 he was appointed Assisstant Lecturer and then Lecturer (1966) at *Aberdeen University*, where he developed his career until 1969. During that year, he moved to the *Department of Geography at the University of Leicester, UK*, where he advanced as *Senior Lecturer,* then *Professor* and since 2003 *Emeritus Professor*. During his 47 years of activity he succeeded in achieving the best teaching and scientific results.

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[1] *The participation to the British-Romanian Seminar, organized by Professor Dr. David Turnock at the universities of Leicester, Sunderland and Luton between August 31 and September 12, 1993, with the paper entitled "Structural Modification of Rural Space in Romania". On this occasion, very instructive fieldtrips have been organized in the areas surrounding the three towns. The above-mentioned action was described in the paper "Third British-Romanian Seminar" (*Studia UBB, Geographia, 2/1993, p. 41-48*). One should also add the drawing up and presentation of the LAUDATIO on the occasion of the granting of the academic title of DOCTOR HONORIS CAUSA to Professor D. Turnock by the West University of Timişoara (May 29, 2000) and the common field researches we made in Apuseni Mountains.*

Regarding his **teaching activity**, one should emphasize that from the very beginning he assumed full responsibility for a very high level of giving lectures and seminars. Among the courses he taught, even since 1970, one should mention the *Philosophy of Geography, History of Geography, Regional Geography of the British Isles* etc. In all these activities, he had constant preoccupations to illustrate cartographically the entire range of debated issues.

In order to increase the understanding and to fix the contents taught during the lectures and seminars, Professor D. Turnock wrote and published several significant books, such as: *A Concise Philosophy of Geography* (five editions), *Regional Geography of the British Isles – Ireland and Scotland*, *Concise Geography of Eastern Europe, Landscape and Settlement in East Anglia etc*.

Together with the teaching activity part, in full condition and inseparable from it, Professor D. Turnock had a highly rewarding **scientific research activity**, very well prepared and conceived. He realized that this is absolutely necessary, on the one hand, for the research of the complexity of geographical phenomena, and on the other hand, the educational process is not possible without a thorough knowledge of the territory (where?), relations (why?) and time (when?) of the realities of geographical space.

Considering the fundamental components of **Geography**, Physical Geography and Human Geography, it comes out that the activity of Professor Dr. D. Turnock belongs almost entirely to the **field of Human Geography**, a very dynamic one during the latest decades due to the more and more obvious impact of the anthropogenic factor on the natural environment. Of course, the research components within Human Geography were characterized by *complex subjects*, analyzed territorially both in England and the other parts of the United Kingdom (Scotland, Ulster and Wales). Regarding the basic subjects, one realizes that they had in view the rural space in almost its entire complexity: population and settlements, agricultural and industrial activities, means of communication and transports, especially the railways etc.

Highlighting the aspects concerning the territories where these subjects were analyzed, it comes out that most of the traditional research activity was carried out in *Scotland*, where he made thorough investigations which resulted in very significant works: *Patterns of Highland Development* (1970), *Problem Regions of Europe – Scotland's Highlands and Islands* (1974), *Industrial Britain – The New Scotland* (1979), *The Historical Geography of Scotland* (1982), *History of Rural Settlement in Scotland* etc.

Apart from the above-mentioned research territory, one may add a number of studies concerning the departments of East Midland, Leicestershire and Devon, as well as other larger areas. There he investigated several aspects regarding land use change, rural settlements, farms, communication lines, which resulted in books like *Railways in the British Isles, Landscapes, Land Use and Society* (1982) and *A Regional History of the Railways of Great Britain - North of Scotland* (1989).

Without forgetting the constant investigation of the geographical space of Great Britain, Professor D. Turnock focused his attention with his full working and intellectual capacity towards Eastern European states, especially Romania, where he arrived for the first time in 1967 as the leader of a group of Scottish geographers. The opportunity to know directly the Romanian geographical realities determined him to reach the conclusion, as he points out in a Curriculum Vitae, that *„As a result of these experiences I decided to specialize on Romania and I have maintained this commitment since coming to Leicester"*.

During the whole period after 1967, he traveled at least once a year to Romania. The scientific research activity was developed on the basis of research programmes performed under

the guidance of the Royal Geographical Society, the Institute of British Geographers, the British Academy, the British Council etc. The cooperation from the side of Romania was ensured by the staff of the Institute of Geography of the Romanian Academy, as well as some teaching staff from the university centres, mainly Cluj-Napoca and Iaşi. During the last two decades, the geographers from the Department of Geography of the West University of Timişoara also took part in this action.

The investigation subjects of this distinguished man of science of European importance in the field of Geography were gradually larger, as the number of investigation stages of the different parts of Romania increased. One of the favourite areas of research, at least for a large period of time, were the Curvature Carpathians and Subcarpathians, where he found the most favourable conditions, made available by the Institute of Geography of the Romanian Academy within the Geographical Research Station at **Pătârlagele** (Buzău County). Apart from this region, during the long period of investigation of the Romanian territory, he also studied other important geographical units within the Southern and Western Carpathians. The research subjects were among the most complex ones, especially regarding rural space: population and settlements, different aspects of agriculture and industry, communication lines, tourism etc.

Professor D. Turnock had a constant and very fruitful coooperation with the Institute of Geography of the Romanian Academy and several teachers of the large university centres. However, depending on the needs of research programmes, he also established numerous scientific relations with a large number of personalities in the fields of History and Sociology, as well as governmental departments, local authorities, planning institutions etc, which amplified during the last two decades.

One should also emphasize the action of investigating thoroughly the Romanian geographical literature, which Professor D. Turnock performed with expertise and diligence. This fact allowed him to have a complete vision of the entire Romanian territory, which contributed essentially to the inclusion of the Romanian geographers in the European and even global scientific circuits. As a result, the Romanian Geographical School was largely appreciated.

The long and deep investigation of the largest part of the Romanian territory, the large scale use of the geographical specialized literature, the beneficial relations established with Romanian geographers and a number of institutions were materialized by means of the organization of high level scientific events, mainly the "*British-Romanian Geographical Seminar"*, which took place both in Romania and Great Britain. The papers presented at these meetings were published in several volumes, for instance "*Rural Change in Romania*" (1995) and "*Enterprise in the British Countryside*" (1997). In a number of situations, such volumes were also published in Romania by the Institute of Geography of the Romanian Academy.

The same conditions of close analysis of the Romanian geographical realities allowed Professor D. Turnock to write and publish a number of larger or smaller works, even since 1974, when he published the book „*An Economic Geography of Romania*" (London, Bell & Hyman, 319 pp.), and in 1986 „*The Romanian Economy in Twentieth Century*" (London, Croom Helm, 296 pp.). To these two books, one should add many other works concerning Eastern Europe, such as: „*Studies in Industrial Geography: Eastern Europe (1978*)", „*The Making of Eastern Europe from the Earliest Times to 1815"*, "*Eastern Europe: Historical Geography 1815-1945", „Eastern Europe: Economic & Political Geography"* and „*Environmental Problems of Eastern Europe"*. The latter four volumes amount to almost 1400 pages altogether. All these works make substantial reference to Romania, according to the subject.

Since 1990, Professor D. Turnock's area of collaboration with the Romanian research and especially university centres developed considerably both from the point of view of the subjects approached and territorially. This fact is proved by the many works written and published either as a single author or in collaboration, in different Romanian journals as well as in Great Britain, notably in the internationally recognized **GEOJURNAL**.

In a concise manner, concerning the above-mentioned issues, we hereby list only a few of the works which refer to:

- *the whole territory of Romania* (The planning of the rural settlements in Romania, Forest railways of Romania, Geography in the new Romania, Hydro-electricity in the Romanian Carpathians, Romania – regional development in transition, The rural transition in Romania, The future of Eastern Europe's small towns – the Romanian case, Railways and economic development in Romania before 1918, Romania's railways under transition – reorganization, rehabilitation and regional development, Romanian railway development 1950-1989, changing priorities for socialist construction etc);
- *some geographical units* (The tourism in Romania – the rural planning in the Carpathians, Forest exploitation and its impact on transport and settlements in the Romanian Carpathians, Agricultural change in the Romanian Carpathians, The Romanian Carpathians in transition – human resources and development potential in the context of national demographic trends, Pătârlagele – a key village in the Buzău Subcarpathians, Human resources for regional development in the Romanian Carpathians, Historical and contemporary aspect of pluriactivity in the Curvature Carpathians of Romania, A rural development strategy for the Apuseni Mountains, Preliminary result of the Apuseni project – Zlatna area, Pluriactivity in Buzău Subcarpathians – the case of plum brandy distilling, etc.);
- *the geographical-historical provinces or the counties* (The Covasna forest railway, The Reşiţa industrial complex – perspectives in historical geography, Prospects for Vrancea – a traditional mountain community in Romania, Living on landslides – the Subcarpathian counties Buzău and Vrancea, A geographical profile of the Vâlcea county, The impact of tourism and conservation of the agriculture in the mountains of the Vâlcea county, Romania, Geographical essays on the Romanian Banat, Rural tourism and economic diversification in Maramureş, Romania, Rebuilding the economy of the Reşiţa region, Southwestern Romania, etc).

Generalizing, it comes out that Professor D. Turnock was a remarkable scientist and one of the top authorities on Human Geography in Great Britain and Eastern Europe, especially Romania. The results of his work, together with an exceptional teaching activity, were materialized in the publication of 44 books (more than 20 as a single author) and around 210 papers. As an outcome, he received the award of the Royal Geographical Society. In Romania, he was honoured with many diplomas and medals. In 2000 he became **Doctor Honoris Causa** of the West University of Timişoara and in 2009 he received the same title from "Alexandru Ioan Cuza" University of Iaşi.

Now, taking into consideration his high quality as a university teacher and knowing his bright results in the scientific research, we have the duty to analyze and capitalize his complex geographical work related to large spaces of Romania, and at the same time, to say:

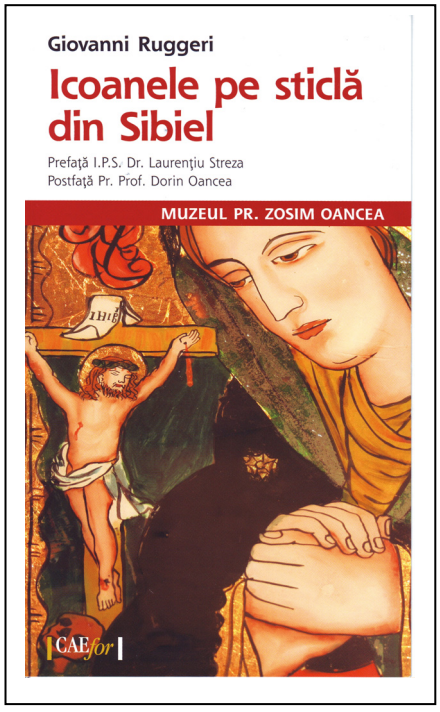
May God rest his soul in peace.

Prof. GRIGOR P. POP PhD

STUDIA UBB GEOGRAPHIA, LVII, 1, 2012, pp. 249-256

Giovanni, Ruggeri, 2008, *Icoanele pe sticlă din Sibiel* (*The Icons Painted on Glass from Sibiel-Sibiu)*, by Giovanni, Ruggeri, the Città Aperta Publishing House, Troina (Italia) 72 p.

Some time ago, namely in 2008, a beautiful and lively monograph called "***The icons on glass from Sibiel***" was published in Italy by the Città Aperta Publishing House. Its author is an Italian journalist from Bergamo by the name of Giovanni Ruggeri.



It is a well-known fact that in the Eastern Orthodox Church "icons have played a crucial part, being revered as part of the liturgy" and also that "they have come a long way, from being strictly rejected in early Christianity to becoming the focus of Orthodox piety" (Eva Haustein-Bartsch, 2009, *Icons*, Taschen Publishing House, Köln, p. 8).

In a short introduction entitled "***The light of Sibiel***", the author introduces us to the tradition of Transylvanian iconographers, whose creations "represent an extraordinary phenomenon of faith and folk art, born out of the great richness of the Christian Orthodox tradition and out of the vast creativity of the Romanian peasant painters […], a blend of fundamental dimensions: spirit and matter, contemplation and involvement, prayer and toil".

Although we consider ourselves these creations to be masterpieces of the folk genius, the recognition that we receive from Italy – "*the country of art*", as it is referred to by Elvira Bogdan, one of Nicolae Iorga's assistants – through Giovanni Ruggeri's voice, reaffirms to us, if needed, the sensibility, skill and value of the Romanian folk iconographers.

The book revolves around two major themes: on one hand, it shortly presents the creations of the Transylvanian iconographers, on the other hand, it includes "the story of a man", the story of Orthodox priest Zosim Oancea, the creator of the Museum of Icons Painted on Glass from Sibiel, who "with clairvoyant intelligence and relentless tenacity has created, being supported by the residents of Sibiel, the largest exhibition of icons painted on glass in one of the smallest villages in Romania". He is an example of faithful devotion for the purpose of spiritually ministering to the community.

Being published in excellent printing and graphic conditions, the book begins with the foreword written by I.P.S. Dr. Laurențiu Streza, Metropolitan of Transylvania, a profound and revered scholar, humble minister of the Church, belonging to the trinity of the wise Orthodox Metropolitans, among which Nicolae Corneanu of Banat and Pimen Zainea of Suceava and Rădăuți are included.

In the foreword entitled "***A heavenly gift***", I.P.S. Dr. Laurențiu Streza considers icons as "windows to divinity" and he also says that "the devoted prayer that takes place in front of them transports people from merely looking at them by means of their senses to spiritual eyesight and to the mystical encounter with the represented persons and with their healing work". The high priest highlights the specificity of the icons painted on glass in the Transylvanian culture, as being "an expression of our nation's spiritual sensibility", from which the icons were born in the beginning as a "comfort, guidance, support and teacher". His Eminence blesses the

toil of the one who is worthy to be mentioned, the priest Zosim Oancea, in preserving the Transylvanian spiritual values, having by his side the community of Sibiel, which followed its shepherd, making available for the European Christian culture their icon dowry and he also blesses the author – Giovanni Ruggeri, relentless in its presentation.

Structured in three chapters, the first two chapters of the book are dedicated to the icons painted on glass from Transylvania, respectively Chapter 1 „***Transylvanian heaven and earth. The way icons painted on glass are born***", as well as to the collection of icons from the museum in Sibiel, in Chapter 2 "***Heavens and earths of Transylvania. The icons from the Priest Zosim Oancea Museum***". Chapter 3 "***Zosim Oancea. The story of a man and of a museum***" is dedicated to the founder of the museum.

After several general considerations regarding the icon, for which he resorts to the teachings of the Church Fathers, such as Saint Basil the Great and Saint John Damascene, the author recalls the harsh political, social and religious conditions of the Romanians from Transylvania, in which context the icons painted on glass appear to be as "one of the effective means of preserving their Orthodox identity", joining the European trend, born in the 17th and 18th centuries in Bavaria, Bohemia, Silezia, Moravia, Galicia and Austria.

In this context, the author describes the miraculous event from Nicula, where the icon painted on wood of the Mother of God with Jesus, painted by the priest Luca from Iclod (who painted icons only on wood, there are no icons painted on glass known to be painted by him!) shed tears for several days in a row in the year 1694 (other say it was in 1699), event that sparked off a lively emotion among the local population and awoke the interest of the Romanian peasants for the icons painted on glass, a material more accessible, obtained manually from melting quartz sand in glass houses. Because of the phenomenon of "shedding tears", the icon from Nicula became a topic icon for many peasant iconographers, first in the Nicula area and then in the entire Transylvania. Thus, in a short period of time, a center of painting icons on glass has developed in Nicula, becoming "the cradle of the Transylvanian icons painted on glass", from where the craft spread in the entire Transylvania because "in 1696, a man called «Ion of Nicula» was already working in Scheii Braşovului" (Juliana Dancu, Dumitru Dancu, 1975, "*La peinture paysane sur verre de Roumanie*", Meridiane Publishing House, Bucharest, p. 49). Thus appeared other centers with famous iconographers, who passed along the craft to their descendents as a "gift of grace", the most flourishing period being in the 19th century and in the first decades of the 20th century.

The author knows that painting icons was not "a merely material act" because, in addition to their technical and artistic skills acquired thanks to a master iconographer and to some "*erminia*" – painting books, the iconographers "were preparing themselves spiritually also, by praying and fasting".

The folk artist iconographer would get their glass from glass houses. There were many glass houses in Transylvania; only in the area of Făgăraş, Juliana and Dumitru Dancu (1975, *op. cit.*, p. 16) mention the ones from Arpaşu de Sus, Făgăraş, Porumbacu de Sus, Tălmaciu, Cârţişoara, Ucea, Avrig. "They produced the colours themselves using natural materials". The actual realization of the icon was done in three phases, as written by Juliana and Dumitru Dancu (*op. cit.*, p. 78), namely: drawing the sketch, which is a black drawing; next, they would draw a network of lines in white or other contrasting colours; finally, the last phase would consist of filling the remaining surfaces with spots of colour.

At the end, after the painting was over, the icon would be framed in a frame which "being an actual part of the icon, would sometimes be painted or carved".

For the Romanian population in Transylvania, which was enjoying at the time some economic prosperity, icons in general and especially the icons painted on glass were extremely popular. Colorful and beautiful, it had "not only spiritual value, but also decorative value" because Transylvanian iconographers had what is called the "*horror vacui*", which is a fear of empty space and therefore, they filled the entire surface of the icon with colour. Of them, Ana Tămaş, (married name: Deji, 1860-194?) led this technique to its peak, revealing its sensitive and feminine side; she was invited in 1934 to the Romanian Peasant Museum at the sociological exhibition, painting live in front of the visitors

and being admired by Nicolae Iorga himself and by paintress Lena Constante, who dedicated a published study to her in the cultural magazine "*Wheat Berries*", which had a circulation of 5000 copies (which culture publication has such a circulation nowadays in Romania?) and by sculptor Mac Constantinescu. Ana Deji was active until the end of the 1930's. Giovanni Ruggeri shows us the photograph of Ana Deji concentrating on an icon, as well as the photograph of an other iconographer, from Laz, Maria Poienaru-Diac, more austere in her iconographic representations.

In the second chapter, the largest chapter, the author describes briefly the collection of icons from the Museum of Sibiel, founded, organised and developed by the endeavour of priest Zosim Oancea. The collection of icons is presented to us in terms of regional affiliation, following the "schools of painting", if it does not sound too grandiose, and in terms of the thematic criterion.

Thus, the author identifies the main themes of the Transylvanian icons painted on glass, respectively, Jesus, the Virgin and the Saints, as well as the Birth, the Baptism, the Last Supper, the Crucifixion, the Resurrection, the Mystic Wine Press, the Final Judgment, in referance to Jesus.

But we find out that "the most common topic is that of the Mother of God, in different situations." Let us not forget the name given by one of the most illustrious popes of Christianity, John Paul II, to the space inhabited by Romanians, which is "*Garden of the Mother of God*". Among the most common subjects of the representations of the Mother of God, there are those with Jesus (as a child) in different situations, the Mother of God Grieving (because of the Crucifixion), the Annunciation, the Coronation of Mary and the Assumption.

The Saints are also depicted in the icons, each "being assigned with a protective power"; the ones imagined the most often are: St. Nicholas, St. George, St. Elijah, St. Haralambos, St. Constantine and Elena, St. Paraskeva, St. Andrew.

The icons painted on glass from Transylvania preserve the essential elements of Byzantine iconography in a local "garment" because "they reflect not only the spiritual universe, but also the material universe of the Transylvanian peasant."

The regional criterion allows the author to identify the areas in Transylvania where famous iconographers can be found and afterwards, to describe their essential features, thus: **Nicula and the north of Transylvania** – "*the cradle of Transylvanian icons painted on glass*", with small format icons, with "simplified forms, saturated spaces, recurring motifs"; the craft has spread from this place to the entire province. The major representatives were: Maria Chifor, Tămaş family, later established in the area of Făgăraş, Prodan family, who later moved to the Maierii neighbourhood in Alba-Iulia, as well as Ion and Maria Chendreşan; **Valea Mureşului**, with the center in **Iernuţeni**, active between 1796-1808, whose icons are characterised "by a unique blend between the influence of Byzantine tradition, typical for icons painted on wood and the motifs inspired by local customs, having Popa Sandu as its most representative iconographer; **the Braşov area**, with its center in **Scheii Braşovului**, where "painting icons on glass made its way through the painters coming from Nicula", such as "Ion of Nicula" active in this area since 1796. He was followed by Ghimbăşanu Iconaru, Elena Faur (1875-1928), Ioan Pop and Ioan Trâmbiţaş. Their icons are "larger and more richly decorated" because of the influences coming from Wallachia and because of a relative prosperity of the Romanian peasants from that area; **the area of Făgăraş** or that of the **Olt area** where "painting icons on glass reached its artistic peak", with well-defined artistic personalities, such as Savu Moga (1816-1899), Matei Ţâmforea (1836-1906) and Ana Tămaş (married name: Deji, 1860-194…). The high thematic and artistic expressiveness of the icons from this area is due to a more profound Orthodox spirituality, maintained thanks to the rulers of Wallachia; **the area of Mărginimea Sibiului**, that "strip of territory around Săliştea organised in 13 villages" strung on the contact line between the hills and mountains, settlement that "has persuaded the inhabitants to a certain occupation, which they developed so thouroughly and practiced on such a large expanse that they remained unsurpassed in the history of shepherding" (Nicolae Dragomir, 1938). In this place, an original style was developed through the work of iconographers Ion Morar (1815-1890) and his daughters Emilia (1861-1931) and Elisabeta (1866-1939), and

Nicolae Oancea (1806-1890) from Vale. The icons are characterised by "the accuracy of the drawing, the chromatic originality, the compositional balance", sometimes with "a mixture of elements of erudite painting"; **the area of Valea Sebeşului – Alba Iulia (Maierii)**, where "more sober colours and more statical compositions characterise the icons" and the characters have a more hieratic physiognomy; in this place, iconographers Ioan Kostea, Nicolae and Petru Zugrav, Savu Poienaru and his family, from the centers in **Laz-Lancrăm**, stood out.

The presentation of these iconographic creation areas represents a foray into the "*cultural geography*" of Transylvania, undertaken with sensibility by Giovanni Ruggeri.

The third chapter is dedicated to the founder of the Museum from Sibiel, priest Zosim Oancea (1911-2005). It is a shattering chapter due to the drama of a journey so special, both of the priest and of the man at the same time, which can be identified with the journey of other hundreds of thousands of patriots – models of civic behaviour that opposed the communism in Romania.

I am grateful to Giovanni Ruggeri, who provides a big enough space for the founder of the museum, because in Romania, communism has destroyed the sense of gratitude to the elites. The communist historiography presents our great political or social events as if they belonged to the masses of peasants, soldiers, workers, knowingly concealing the role of personalities! A serious error that is perpetuated to this day! Why?

At a particular moment in time when he was assessing his life, priest Zosim Oancea said: "I and my generation have lived a life of suffering and sacrifice, but we have not lost faith in our eternal values. What I managed to accomplish, with God's help and with the help of so many people of good faith is somehow a revenge on the perpetrators of my generation. I learned what confession and forgiveness means and the icon has always seemed to me a sharing of the eyes and soul of goodness and beauty that connects us and takes us all to the One who has conquered the world."

Zosim Oancea was born in 1911 in the village Alma, near Mediaş. Shortly, he becomes an orphan because of his father's death and is raised by his mother, Anica and by one of his grandfathers. With great efforts, he managed to attend and graduate from the Faculty of Theology from Bucharest in 1935.

The lines in which he himself describes the special affection that his grandfather had for him are full of tenderness: "when I was a child, I would sleep only in the barn, in the hay, in the summer nights, that is where I liked to sleep. Often, when I woke up, my grandpa used to bring me something, a fruit or something else. He would climb in the barn and put them next to me so I could find them when I woke up. My grandpa Zosim was a very special and smart man…" Here we can see a genuine sequence of life from the interwar period in Romania, when the valuable elements of society rose from a healthy peasantry, their success intertwining with the nation's success! By his own merits, young Zosim Oancea became a priest at the Orthodox Cathedral in Sibiu and a professor of theology, but his beautiful evolution was suddenly interrupted on 7th July 1948, when he was arrested on political grounds. In a Romania of "popular democracy", the Great Purge began by eliminating the valuable elements formed in the solid patterns of a monarchical interwar Romania.

Priest Zosim suffered for ten years the privations of the communist prison system in Aiud (until 1957), where, as he confesses "the first miracle of his life happened", while he was sharing abject cells with the personalities of the Romanian elite. But "God was not far, in heavens, He was like a neighbour, you could talk to Him and ask Him as if He was a neighbour. That is how close He felt!" Released from prison to take the path of house arrest in Bărăgan and in the Danube Delta, where he lived until September 1963, he saw his youngest child for the first time, in a railway station...

His reintegration into social life took place at the beginning of 1964, when priest Oancea was entrusted with the parish from Sibiel, which he served at the Holy Trinity church. At the age of fifty-three years old, he began to work hard to raise the morality of the village, in a genuine pastoral and liturgical life, reaching true unity with his believers, becoming a "*genius loci*", whose protecting spirit grows as time passes by…

After carefully restoring the church, on Easter Day in 1969, he launched the idea of creating a museum of icons to his parishioners,

accomplishment, which he himself considered to be "the second miracle of his life". Charming pages follow, in which Giovanni Ruggeri describes different episodes, which accompanied the completion of the icon museum from Sibiel because "Romanians are not communist at heart. Very few fools were persuaded!" as priest Oancea Senior said himself. Then, the museum became well-known and was visited by many secular and ecclesiastical personalities from all over the world, and radio stations such as BBC and NBC have reported on this topic.

If the collection of the museum of Transylvanian icons painted on glass, belonging to priest Zosim Oancea, from Sibiel has enjoyed, as we can see, the attention and promotion of an author such as Giovanni Ruggeri, we cannot say the same thing about other great collections in Romania, which are known only by exegetes.

We mention here the collections of Dr. Ştefan (1902-1973) and Marietta Jianu, Dr. Corneliu Anton Ciobanu and Simona, Dr. Klaus Kessler, of the priest from Sic-Gherla and his wife, Alexandru (1866-1934) and Liana Bidian, of professor Garabet Avachian, of Nicolae Romalo, of musicologist Constantin Brăiloiu (1893, Bucharest – 1958, Geneva), of Liviu Scorobeţ from Cârţişoara, of husband and wife Juliana and Dumitru Dancu, of C.S. Niculescu-Plopşor and there will be many others. All these collections deserve thorough monographs, in order to become known and thus enter the cultural circuit, as important identity pieces of the spirituality of our nation.

In the afterword entitled "***Encounters on the thread of destiny***", the youngest son of priest Oancea, Dorin Oancea, he himself being a priest and a professor of theology, points out in a few well-written and soul-felt sentences, the moral portrait of his parents, through the eyes of the child that experienced the great trials his family had to go through.

A short bibliography is attached to the book and it ends with thanks given by the author to the ones who helped him in his undertaking, both to the ones in Romania and to the ones in Italy, where the book was published in excellent graphic conditions, having numerous reproductions in colour, sepia and black and white, of great accuracy; it was published in Romanian, Italian, German, English and French, making it accessible to a very large inland and foreign public, to which a general information site is available: www.sibiel.net. Also, Giovanni Ruggeri, besides the fact that he created this book, which can become a spiritual bridge between Romanians and Italians, a means for them to better understand our spirituality, he also is a tireless presenter of our values – the Transylvanian icons painted on glass, to the public in Western Europe. For all these things, we also thank journalist Giovanni Ruggeri, who managed to capture an aspect of our spirituality, proving that the Latin saying "*sunt fata locorum*" is true, which means that all places have their own story…

As for me, I bring a modest tribute to the memory of priest Zosim Oancea, accompanying this review with three icons from the area of Făgăraş, painted by Ana Deji.

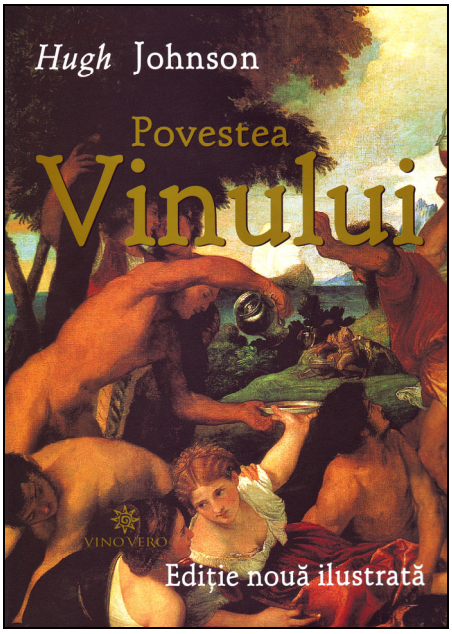
I highly recommend this book, little jewel of Romanian spirituality, to all who are passionate about art and beauty, to those who desire to understand, a second faster, the iconographic representations of those who drew their inspiration from the wonderful multicultural geographical space called Transylvania.

Lecturer Alexandru Păcurar Ph.D.

Johnson, Hugh, 2009, *Povestea vinului – ediţie nouă ilustrată*, coordinated by Maia Banciu, Vino Vero SRL, Cluj-Napoca, 256 p. (Johnson Hugh, *The Story of Wine – New Illustrated Edition,* Octopus Publishing Group Ltd.).

The Vino Vero SRL Company from Cluj-Napoca offered us in 2009 the translation of the excellent monograph on wine written by Hugh Johnson ″The Story of Wine – new illustrated edition, actually the first edition in Romanian, translated by Maia Banciu (born Homorodean) and Alex Moldovan. The book can be purchased from the ″Vino Vero" shop located on Napoca Street, no. 13, as well as from the chain bookstores Humanitas, Cărtureşti and Book Corner.

The book originally appeared in 1989 in Great Britain, being a real success, which is why it was published in many editions, showing the public's interest in wine, in the ″institution of wine" as an anthropo-cultural act.



The book is divided into 43 chapters, it contains a foreword and an index, the text is accompanied by many images and suggestive cartographic sketches that complete them, proving the vast knowledge of the author in the vine growing and grape processing field.

The chapters are short (4 or 5 pages), full of information, the style is alert, fluent, fairy-tale-like, to sum up, it is a captivating narration which shows the exegete qualities of Hugh Johnson in this field. In a modest way, the author states in the "Foreword" that "this book – The Story of Wine – is the interpretation that I give to the history of wine, my attempt to place it in the context of different periods of time and to understand why do we have such a wide variety of wines and why we do not have others".

The titles of the chapters are very suggestive and represent the very essence of them. Thus, in the first chapter, "The power to ward off anxieties", the author shares his fear that the first wine drinkers have rather consumed it because of its effectiveness in driving away anxieties, in potentiating the intellect and the body, thanks to its content, in various proportions, of sugars, acids, esters, acetates, dissolved in the watery solution of ethanol obtained by fermentation.

The miraculous plant that produces the fruit - the grape vine – the *Vitis*, from which wine is obtained, has been named *vinifera* by the botanists. At the beginning, people would obtain it from wild grape vine *Vitis vinifera sylvestris* (which was found in the forests), then, from the selected one *Vitis vinifera sativa* (which was cultivated), the region of origin being the Caucasus, where it has been cultivated since 7000 B.C.

After the author describes the area "where the grapes were crushed for the first time", he forays in the "culture of wine" from Egypt, Greece, Ancient Rome and Judea, where wine received liturgical and Christian connotations. There is dense information, starting from the cultivation techniques of the grape vine to the techniques of obtaining, preparing and conservation of the wine, the gods that protected the cultivation of the plant, to the games of the parties that were stimulated by it and the forms of socialization generated by it, including the conntotations received by it as a symbol of sacrifice for the Christians.

Through the Greeks and then through the Romans, the vine growing culture has spread in Europe and in the Orient, being cultivated by Gauls in France, by Thracians in Macedonia, by Dacians-Getae in Dacia, by the beginning of the Middle Ages the grape vine being cultivated everywhere it was possible in Europe, Charles the Great (Charlemagne or Karl der Grosse) proving to be a great oenologist, too. Following the grape vine spreading in Europe, the author forays pertinently in various fields, giving examples from mithology, arts and old chronicles. Information is offered concerning the grape processing techniques, the making of the wine, the consumership, in chapters like "*How medieval wine was made and tasted*", "*The monastery and the wine press*", as well as the presentation of European trade flows concerning this very popular product, approaching a wide variety of themes: the way it was transported, the counterfeiting problem, the emergence of big vineyards, famous viticulturists and better breeds of wine, making real case studies, such as viticulture in Bordeaux (France) or Porto (Portugal), which developed and became early prosperous because of the wine commerce with England and the Nordic countries.

Concerning the 18th century, the author notes the birth of the golden rules of oenology expressed by the Benedictine monk Dom Pierre Pérignon, published in 1718, three years after his death, whereas in 1662 in England – a great consumer of wine – a treatise on the processing of grapes was published, entitled *"The Art of Wine Making*". In that period, the famous vineyards from Champagne, Burgundy, Bordeaux, Porto, Madeira, Aragon, Loire Valley, Rhine Valley, Piedmont, Tuscany and Tokoj were already well-known on a market that continually expanded, each one of them with its own "story", so naturally narrated by the author. He examines the diversification of the wine production when aside from the "heavyweight" wines, the light and frothy ones appeared, such as champagne. He also mentions the new professions related to the processing, storing and merchandising of the wines, such as the profession of *courtier-commissionnaire*, its first representative being Claude Moët in 1716.

The Dutch entrepreneurs - attentive observers and sea transporters – introduced the vine growing culture in South Africa, Cap Province, where the first harvest was pressed in 1659 in Groot Constantia Colony, the reader having the possibility to discover with great pleasure the first steps in the development of this viticultural region.

In the 18th century, the activity in the wine field had become a real economic branch, which led to wealth, as it is proved in chapters 26 to 28, *"The great theatre*", *"The mapping of the Golden Coast*" and *"The cabarets of Paris*" where "everything revolves around wine".

The next chapters are dedicated to the techniques of vinification and the wine production in the German states, to the "story" of the famous *Riesling*, to the methods of selecting the *butlers* and the *"kabinett wine*" for the elites, in the chapter *"Kabinet wine*", as well as to the major changes that happened in the *"Zollverein*" period (the Customs Union), when the quality producers were selected.

In the chapter *"Three bottles*", the author describes "the evolution of taste" of the wine consumers from England in the 17th and 18th centuries. Then, he notices the drastic changes brought in this field by the French Revolution in the chapters *"Before and after the Revolution*" and *"Methode Champenoise*" up until the moment of the real "boom" of vinification from the period known as "The Golden Age" of the vineyards from Bordeaux and Burgundy in the 19th century, described in Chapter 36.

In *"Wine cellars and storehouses*", Hugh Johnson insists on the Spanish-Iberian and Portuguese specific traits – in vinification, transport and wine consumership.

Chapter 34, *"John Bull's vineyard*" is devoted to Australia, where we find out about the epic of the pioneers of the vine growing culture and vinification, about certain characters, such as John Macarthur, James Busby, considered to be the father of the Australian wine or about the cultivators James King or John Reynell, who introduced and expanded the culture in New South Wales, on the valleys Yarra and Hunter River, in Victoria around Melbourne and South Australia state, at Adelaide. Curiously, the first viticultural Australian farm, dating from 1829, was founded in the West, on the banks of Swan River. The breeds that were brought - more than 570! – were predominantly European, but also from South Africa. The association between exploiting gold and viticulture is very interesting, "if the immigrants who came in waves after 1850 did not find gold or if it was finished, they would plant vines". Thus, the "map" of the viticultural Australian development contains "vineyards spread randomly where gold could be found and even where it could not be found...".

The North American continent, with big oscillations of the climatic parameters, having a lot of pests, has entered in the grape and wine production later, only after 1800, when, thanks to their perseverance, the colonists succeded in domesticating strong breeds, both on the East Coast and on the West Coast, in a real "epic", described by the author in such a fascinating way.

Chapter 38, *"Trouble never comes alone*" is devoted to the attack of the phylloxera which "gave a heavy blow to the European vineyards" generating a crisis that unfolded over a period of four decades, reaching its "peak" in 1880.

Chapter 39 is "Italian", because for Italy "wine is even more important as an identity factor than it is for France" concludes the author, in his distinctive style – namely making connections

with the sociopolitical evolution – he introduces us into the modern period of the ″wine civilization", with its entire corollary: its own techniques of cultivation and processing, specific terms, the brief presentation of some big vinicultural regions, as well as the contribution of some exegetes in this field, such as Dottore Cerletti, the first director of the new Oenology Institute from Piedmont, founded at the end of the 19th century.

The chapter entitled ″*The Hispanic rebirth*" introduces us into the specifics of the modern Spanish viticulture and of its colonies, which expanded this activity, especially after gaining independence; we are offered interesting information concerning the big vineyards from the Rioja Provinces, such as Riscal, Ygay and Logroño and Duero.

After ″*50 years of crisis*", a series of ″good years and bad years" for the wine production, of regulations and prohibitions in the culture and consumership of alcohol (the Prohibition), which are presented by the author in a fluent style, with social and political interactions, that radically changed the first decades of the 20th century, we are exemplarily presented in the last two chapters ″*The challenges of the New World*" and ″*The answer of the Old World*", so cleverly mirrored by Hugh Johnson, ″a period that reflects the globalization of wine".

Reading the book is exciting because the style is fluent, lively, but not effortless!, the book being very well translated. It is an exercise of oenologic education, which brings together people, actions, ideas, all of these having as goal the production of the Bacchic nectar.

The pleasure of reading is slightly shadowed for the Romanian reader because there is no word in the book mentioning the ancient tradition of the vine growing culture in the Romanian geographical area, which goes as far as the second and the first centuries BC or any Romanian vineyard, some of them famous even since the Middle Ages, with the exception of Transylvania, which is mentioned briefly at Hungary, but does not appear in the ″Index", as well as the Rákóczi family, with great accomplishments in this field. It is the responsibility of the new generations of cultivators and processors from the viticultural field from Romania – some of them resumed a noble tradition, so necessary! – to make known to consumers and experts our contribution to the ″wine culture", as it is from now on, from which for far too long - 50 years - we excluded ourselves through statism and through the annihilation of the producers.

The book is directed to a vast majority of people, both to the general public and to the experts in geography, cultural anthropology and history. The geographers will complete their knowledge through the ″cultural" side of the vine growing culture, which is so necessary for them, especially because there is a current trend towards interdisciplinary, relational, correlative and integrative approaches and not towards locational geography. Therefore, the book should not be missing from any ″geography" library, let alone from general libraries, both private and public, because it has multiple educational valences.

It should be noted that many of the wines mentioned in Hugh Johnson's book can be found at the ″Vino Vero" shop in Cluj, Napoca Street, no. 13, owned by the Banciu family and the associates. Through selection and events, the shop is dedicated to the recovery of the lost culture of quality wine. Moreover, following this educational approach, Maia Banciu has translated and published the book called ″*Wine Tasting*" written by Jancis Robinson, which appeared in February 2011.

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