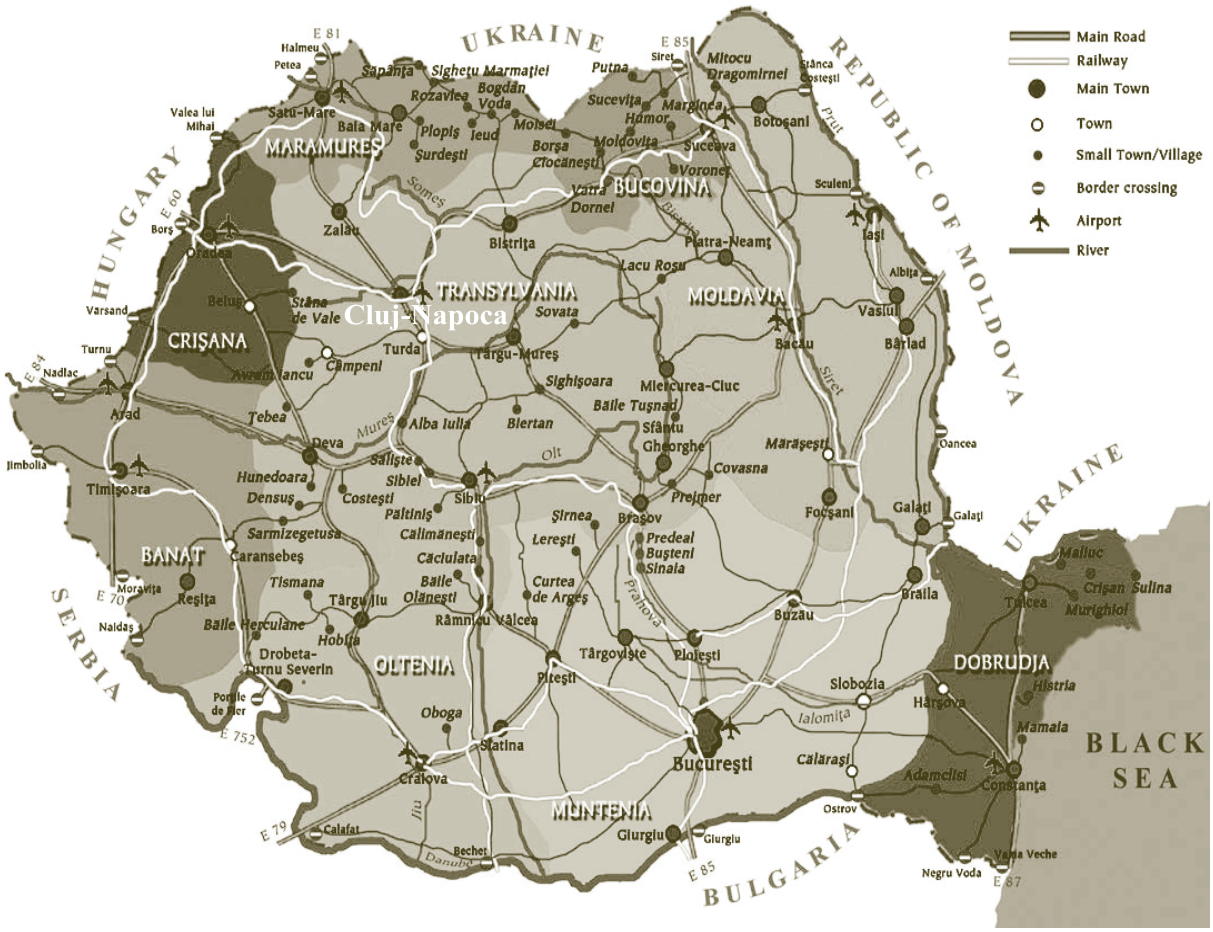
STUDIA UNIVERSITATIS
BABEŞ-BOLYAI



GEOGRAPHIA

2/2011

YEAR **(LVI) 2011**
MONTH **SEPTEMBER**
ISSUE **2**

S T U D I A

UNIVERSITATIS BABEŞ–BOLYAI

GEOGRAPHIA

2

Desktop Editing Office: 51ST B.P. Hasdeu, Cluj-Napoca, Romania, Phone + 40 264-40.53.52

CUPRINS – CONTENT – SOMMAIRE – INHALT

Notes and Book Reviews – Note şi recenzii

STUDIA UBB GEOGRAPHIA, LVI, 2, 2011

SPATIAL DISTRIBUTION OF DEEP-SEATED LANDSLIDES (GLIMEE) IN THE TRANSYLVANIAN BASIN

V. SURDEANU[1], MONICA MOLDOVAN[1], T. ANGHEL, ŞT. BUIMAGA-IARINCA, O. POP, I. RUS

ABSTRACT. – Spatial Distribution of Deep-seated Landslides (glimee) in the Transylvanian Basin. The deep-seated landslides (glimee) have played an important role in the evolution of the Transylvanian landscape, causing the reshaping of the slopes. Previous research indicates that the triggering moment of this landslide began during the Late Glacial Period or even in the Eemian Period. Although contemporary geomorphologic processes affect the body of the landslides, it remains a specific element of the landscape in Transylvanian Basin. In our study we performed a statistical analysis, regarding some factors like spatial distribution, the altitude of the scarp, the regional morphologic units, lithology and slope exposure. Our attempt is to emphasize the relations between the deep-seated landslides and the adjoining territory.

Keywords: *Deep-seated landslide, glimee, Transylvanian Basin.*

1. INTRODUCTION

The deep-seated landslides (glimee) represent one of the specific aspects of the geomorphologic landscape in the Transylvanian Basin. These types of landslides are represented by massive mass displacements with a characteristic morphology in form of mounds and depression areas.

Although most of the Transylvanian Basin subunits are affected by mass movements, these type of landslides presents local differences that give a specific note to the area where they are positioned.

In the Transylvanian Plain is noted the largest number of areas affected by deep-seated landslides (over 500, according to Gârbacea, V., 1992). In the Hârtibaciului Plateau their number is reduced, but they have larger sliding surfaces (Şaeş, Movile, Saschiz and Cornăţel).

Regarding on their localization along the longitudinal profile of the slopes, the landslides are found at their bases (Suatu), at the top (Apold, Bozieş, Românesti) as well as along the whole profile (Sălicea, Urmeniş, Şaeş, Saschiz).

Determining the landslides age was one of the main issues covered in the specialized studies. Therefore, we find several hypotheses regarding their triggering periods such as that the assumption that they begin with the Late Glacial until Subatlantic (last 3000 years), with the possibility that some of them still have occurred during the Eemian (114000 years ago) (Pendea, Fl., 2005).

[1] *"Babeş-Bolyai" University, Faculty of Geography, 400006 Cluj-Napoca, Romania, e-mail: surdeanu@geografie.ubbcluj.ro*

The purpose of our scientific approach is to interpret the spatial distribution of deep-seated landslides (glimee) in Transylvanian Basin. The selected factors for analysis are: lithology, slided slopes exposure, altitude of the scarp, and the regional units to which they belong.

During the two years of the study, we inventoried 400 sites of glimee sliding type, and on this basis we performed a statistical analysis aiming to establish the relations between the landslides and the adjoining territory.

2. METHODOLOGY

For achieving our study, we used GIS techniques and geostatistical methods. For determining the area of the landslide, scarp area, the height values and the slope exposure we have used GIS tools. To establish the correlations between the factors listed and landslides we used geostatistical methods. We analyzed the distribution of the deep-seated landslides with reference to lithological, morphological parameters and regional influences.

Identification of the areas with deep-seated landslides, mapping the surface area of the slides and their scarp areas was carried out in field campaigns in the last two years. For areas where we encountered difficulties in tracing the exact surfaces of the landslides we used aerial photographs (edition 2002-2005).

3. RESULTS AND DISCUSSIONS

Regarding the spatial distribution of the deep-seated landslides within the regional morphological units of the Transylvanian Basin (fig. 1), their concentration is highlighted in the Transylvanian Plain (225 landslides), followed by Hârtibaciului Plateau (51 landslides), Târnavei Hills (47 landslides) and Someş Plateau (43 landslides).

A small number of deep-seated landslides sites are recorded in the marginal regions of our study area. The meadow morphology of Turda – Alba-Iulia Corridor has induced a reduced presence of this type of landslide, thus in Măhăceni Plateau we found only four sites (Dumbrava, Unirea, Măhăceni) and one site in Aiud Hills (Gârbovita - Aiud). In Târnavelor and Mureş Hills, the development of the deep-seated landslides was restricted to areas consisting of marls, sands and gravel belonging to Sarmatian Period (Ruştior, Dumitra - Bistriţa Hills) and of argillaceous marls and sand deposits belonging to Pannonian Period (Iara de Mureş, Măgherani - Târnavei Hills).

The previous studies indicate that a large number of deep-seated landslides are developed on Sarmatian deposits or at the contact with those of the Pannonian (Grecu Fl., 1983). This distribution reveals the importance of this type of stratigraphic deposits. Alternating layers of sand and gravel permit the water infiltration, causing the wetting of impermeable layers, which triggers the mass movement. For defining a correlation between deep-seated landslides and the lithologic units presented in the geological maps (scale 1:200000), we determined their spatial distribution (fig. 2). By analyzing the graph in figure 2, we noted that 57.4% of identified landslides overlap formations of marls, sands and gravels, belonging to the Sarmatian Period (Tăureni, Şeulia, Sângeorgiu de Câmpie).

A percentage of 17.5% is represented by landslides located on Pannonian formations, composed of argillaceous marls and sands (Corunca, Romanesti), and 7.7% of them are located on the Badenian age formations, respectively marlstones and volcanic tuffs (Câmpeneşti, Sucutard). A small number of deep-seated landslides (5.1%) are found in formations consisting of limestones or conglomerates; only 0.1% of the total is found on sandstone deposits.

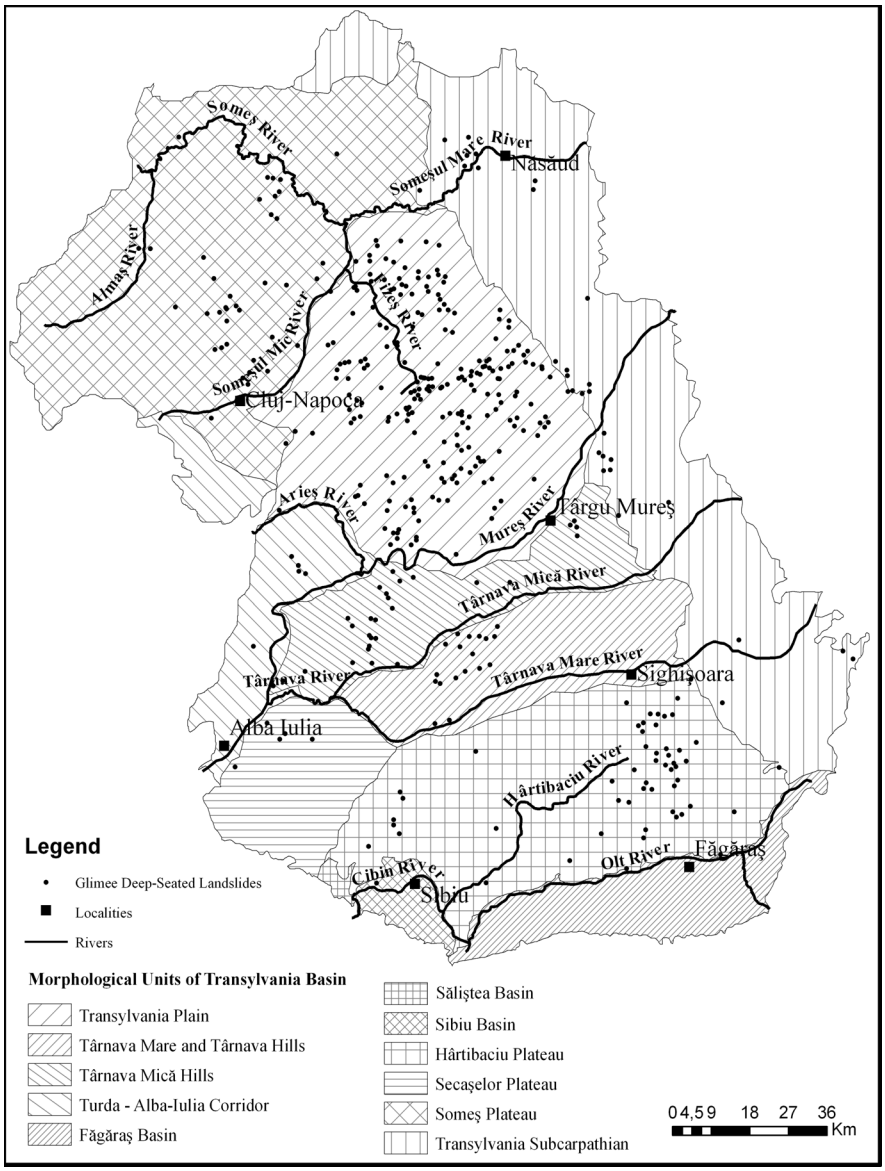


Fig. 1. Spatial distribution map of the deep-seated landslides (glimee) within the regional morphologic units of the Transylvania Basin.

In terms of petrography, the deep-seated landslides are developed mainly on marls, sands and gravels from the Sarmatian Period, argillaceous marls and sand formations from Pannonian age; formations with argillaceous marls, sandstone, salt and volcanic tuffs (belonging to Badenian) and also the marls and volcanic tuffs (from Buglovian).

Preexisting morphology, petrography and micro-climatic conditions have induced particularities to each landslide, determining the specificity at the level of morphological units. For example the deep-seated landslides in the Transylvanian Plain, developed on formations of marls, sands and gravels (Sarmatian), have larger surfaces than the Hârtibaciu Plateau landslides, which are developed on argillaceous marls and sands formations (Pannonian).

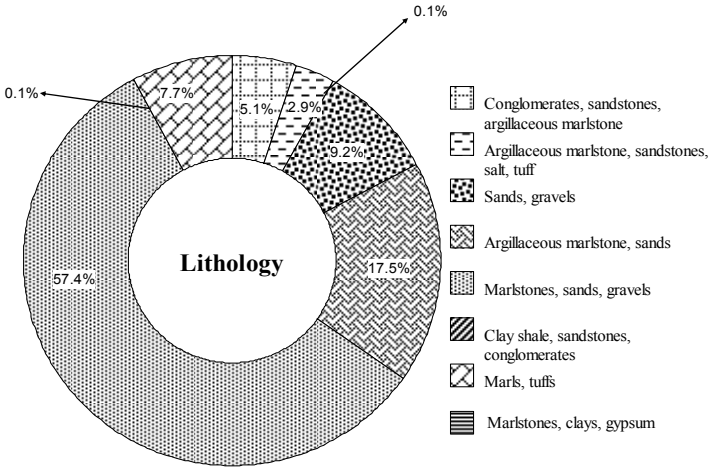


Fig. 2. Distribution of deep-seated landslides from Transylvanian Basin depending on the lithology.

Therefore, it is obvious that the morphology of pre-existing relief and petrography has an important role in the evolution of the deep-seated landslides, without ignoring important external factors like climate, vegetation and human activities.

Spatial distribution of this type of landslides in Transylvanian Basin was correlated with altitude of the scarp zone in order to determine the altitude classes on which they develop. Choosing the scarp as a landmark, the study was based on two morphologic criteria. The first criterion refers to the fact that the scarp area is considered a source of deposits that can be reshaped, and the second refers to the degradation of the landslide's toe, partially or totally.

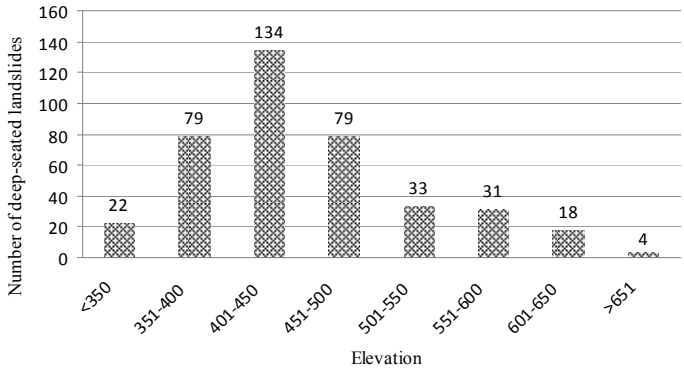


Fig. 3. Distribution of deep-seated landslides from Transylvanian Basin depending on the detachment area's altitude.

To analyze the distribution of the alti-tude of the scarp area we established eight classes of altitude values.

In figure 3, we can estimate that the largest number of deep-seated landslides, respectively 134, is recorded in the range of 401 – 450 m. Both in the altitude class 351 – 400 and 451 – 500, we identified 79 deep-seated landslides.

We emphasize that in the altitude range of 300 – 500 m there are over 71.4% of the total number of deep-seated landslides. A small percentage is found at over 600 m.

Although in the altitudinal range of 401 – 450 m there is the largest number of deep-seated landslides, their current areas are relatively small. Landslides that have surfaces areas over 700 ha are encountered between 551m – 600 m in altitude (Saschiz-786 ha, Movile-1104 ha, Saes-1654 ha).

Geomorphologic processes related to water (erosion, landslides and mudflows) and the type of vegetation are influenced by the slope's exposure. Northern exposure causes a higher degree of moisture and small variations of the wet-dry cycles. South facing slopes show a low humidity, with frequently alternating wet and dry periods (Sidle R., Ochiai H., 2006).

The correlation between spatial distribution and orientation of slopes provides additional information in order to study the evolution of deep-seated landslides (glimee). The presence of a large number of landslides (61%) on sunny slopes (fig. 4) indicates the importance of the wetting - drying and freeze – thaw periods.

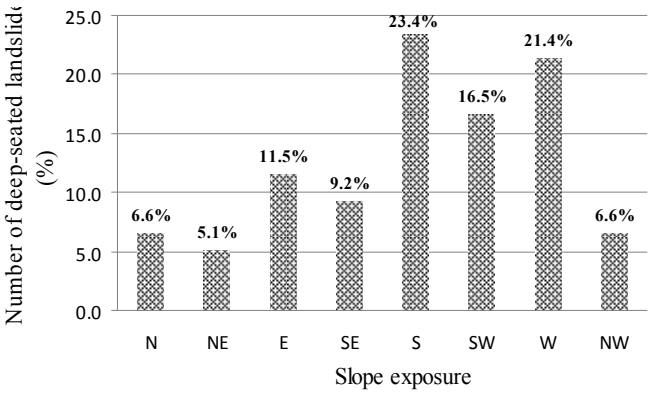


Fig. 4. Spatial distribution of deep-seated landslides from Transylvanian Basin depending on the slope exposure.

Most landslides, with a percentage over 23% of the total, were identified on the southern slopes. In addition, a signifycant percentage is recorded on western slopes (over 21%) and those on south-west orien-tation (17%). A small number of deep-seated landslides appeared in the shaded slopes (7% on the northern slopes and 5% of the north-eastern) due to lack of high frequency of wet periods alternated with dry ones. Taking into account data obtained from the correlation between slope exposure and deep-seated landslides surfaces (in hectares) we found that the sites with the largest area are on western slopes (Saes - 1654 ha), south-west (Movile – 1104 ha) and southern (Biia – 1148 ha)

The relevance of the slope's orientation analysis increases when is correlated with other factors, such as lithology, morphology. This fact is emphasized by the existence of deep-seated landslides with area over 700 hectares on the north facing slopes (Șăulia-Leorința 1340 ha – Transylvania Plain).

4. CONCLUSIONS

Spatial distribution of deep-seated landslides (glimee) in the Transylvanian Basin highlights the relations between internal factors (lithology, structure) and external factors (climate, hydrology, vegetation) and last but not least the anthropic factor.

R E F E R E N C E S

1. Gârbacea, V. (1992), *Harta glimeelor din Câmpia Transilvaniei*, Studia Universitatis "Babeş-Bolyai", Cluj-Napoca, Seria Geographia, vol. XXXVII, nr. 1-2.
2. Gârbacea, V., Grecu Florina (1983), *Relieful pe glimee din Podişul Transilvaniei şi potentialul lui economic*, Mem. Secţ. Şt. Acad. Română, seris IV, tomul IV, nr. 2-1982.
3. Grecu, Florina (1997), *Glimee - Induced relief modeling in Transylvanian Tableland*. Studia Universitatis "Babeş-Bolyai", Seria Geographia, Cluj-Napoca.
4. Jakab, S. (1981), *Modelarea versanţilor din Dealurile Târnavelor prin alunecări de teren,* Lucrările Conferinţei Naţionale pentru Ştiinţa Solului Braşov, Publicaţiile Societăţii Naţionale Române pentru Ştiinţa Solului, Bucureşti.
5. Josan, N. (1973), Podişul Transilvan dintre Târnava Mare şi Mureş (Dl. Târnavei Mari): studiu geomorfologic, Teză de disertaţie, Universitatea "Babeş-Bolyai", Cluj-Napoca.
6. Matei, L. (1983), *Argilele panoniene din Transilvania,* Edit. Academiei, Bucureşti
7. Morariu, T., Gârbacea, V. (1968), *Deplacements massifs de terrain de type glimee en Roumanie*, Revue Roumaine de Geologie, Geographie, Geophisique, Serie de Geographie, tome 12, nr. 1-2, Edit. Academiei, Bucureşti.
8. Pop, Gr. (2001), *Depresiunea Transilvaniei*, Edit. Presa Universitara Clujeana, Cluj- Napoca.
9. Savu, Al. (1963), *Podişul Someşan – studiu geomorfologic*, Teză de dizertaţie, Universitatea "Babeş-Bolyai", Facultatea de Ştiinte Naturale – Geografie, Cluj-Napoca.
10. Sidle, R., Ochiai, H., (2006), *Landslides: Processes, Prediction, and Land Use*, Water Resources Monograph 18, American Geophysical Union, Washington, DC.
11. Vancea, A. (1960), *Neogenul din Bazinul Transilvaniei*, Edit. Academiei Republicii Populare Române, Bucureşti.

Note: This work was supported by CNCSIS-UEFISCSU; project number PN II-IDEI 2465/2008

STUDIA UBB GEOGRAPHIA, LVI, 2, 2011

SLOPE PROCESSES IN THE ŞIEU RIVER BASIN

CLAUDIA – LOREDANA CLIVEŢ[1] (married CRISTEA), I. A. IRIMUŞ[1], ANCA AFLAT[1], F. V. PETREA[1] (married TULUC)

ABSTRACT. – Slope Processes in the Şieu River Basin. In the natural evolution of the physico - geographical factors, an essential role is that of the relief changes. It cumulates a series of features of other components such as the petrographical structure, soil type, vegetation coverage, vegetation type, the type of climate and water drainage. Rains, especially torrential ones, carry out a mechanical action on the soil, at first as solifluction, then dissolution and transport towards the slope base. Rains, mostly torrential ones, carry out a special mechanical action upon the soil, of displacement and transport of solid particles. Pluvial - denudation, the dispersed liquid leaking and stream drainage (which produces channels) are the main energetic components of surface soil erosion. The organization of concentrated liquid flow, in the form of micro – currents, giving rise to ephemeral floods in small basins, typically with a high value of turbidity, leads to the development and increasing of gully erosion. The higher or lower slope of the relief, the higher or lower strength of rocks, the presence or absence of vegetation, combined or separated, may form causes that may hinder or favor the formation of solid flow and the development of torrential bodies in the Şieu river basin. A particular aspect is represented by the steep slopes of the Şieu valley between Sărăţel and Şieuţ, as well as its tributaries from the area, but also parts of the left side slope of the valley between the Sărăţel and Şieu townships. Slopes in these sectors have not reached an equilibrium profile thus being subject to processes of collapse and active landslides. In this way, temporary and locally, flowing waters get loaded with large amounts of silt in suspension, which clog up footbridges and small bridges, causing the flooding of localities (Budac, Domneşti, Sântioana and Şieu).

Keywords: *soil erosion, gully erosion, slope, Şieu River.*

1. INTRODUCTION

I dedicated this detailed land study to the Şieu River basin, the main tributary – left sided – of Bistriţa River (North–East of the Transylvanian Depression) for the following reasons:

- although small in size – 447 square kilometres – which is about 8.42% of the Bistriţa-Năsăud county area (in which it is fully integrated) is one of the county's most outstanding agricultural area, largely uncoiled in the Eastern Carpathians mountainous area (more than 1/3), so with a restricted amount of crop – land;

- it has a relatively complex lithology (clays, marls, sands, sandstones, andesites), but with alternations and facies variations that have resulted in a hilly terrain (500–650 m the regular slope ridge altitude) with medium relief energy and increased fragmentation, encouraging overall, a very wide range of actual slope processes;

[1] *Babeş-Bolyai University, Faculty of Geography, 400006, Cluj-Napoca, Romania, e-mail: claudia.cristea@geografie.ubbcluj.ro; irimus@geografie.ubbcluj.ro; anca.aflat@geografie.ubbcluj.ro; viorel.petrea@geografie.ubbcluj.ro*

- the mobility of the geographical landscape elements, is also completed by other factors: the climate specific to the high hills area of the eastern Transylvanian Plain (annual average temperature of 8.1°C, medium annual amplitude of 22.5°C), annual precipitation bellow 700 mm – 635mm at Şieu, 640mm at Mărişelu, 660mm at Budac, generally non-uniformly distributed, but with a maximum frequency in June and minimum in February and with a particular intensity of convective rainfalls in the increasing aridity index as a result of massive deforestation;

- the hydrographic network, richly branched, with average density values, but with a large balance of its semi-permanent artery (about 50%), which increases the torrential regime and hence the strength of linear erosion, even for the 2 -3 km long valleys;

- the low percentage of forest covered areas (6.09%) which are broader only on the ridges, at Râpa (the slope ridge between the Şieu and Dipşa valleys), Mărgurica (the slope ridge between the Ardan and Budacului valleys), Rotund (the slope ridge between the Ruştior and Ardan valleys), otherwise maintaining its insularity, thus without a special significance in the braking of slope processes;

- the significant share of ploughable land (in most communes over 50%) and that of natural grasslands (30 – 40%), compared to forests, orchards, vineyards, meadow-lands, establishes an important factor in the triggering of slope processes;

- the appreciable density of settlements, some of which are large and medium (Măgurele, Budacu de Jos, Şieu, Budacu de Sus, Domneşti etc.), the 477 square kilometres river basin comprising 23 settlements, meaning one at 17.6 square kilometres, which justifies the extension of deforestation with the purpose of gaining new agricultural lands.

2. SECTORS OF SLOPE FORMATION AND EVOLUTION

Amid this complex of factors and some local peculiarities, the slope processes of the Şieu catchment present a large variety (different intensity areal erosion, land failures and landslides, torrential erosion), spread on a wide area. Taking into account the frequency, intensity and predominant types of processes, several areas on which we insist on the following, can be distinguished:

2. 1. The Upper Şieu River Basin. With old and almost generalized deforestation, has a high percentage of arable land (65% in the area of Şieut township, in the southern part of the region). All types of degradation are present, with local differences in the association between them and their intensity as processes. In the vicinity of Ardan, Lunca and Sebiş localities, the strong and moderate areal erosion is dominant, associated, in all cases, with frequent landslides on the west and south – west slopes. With the 1970`s rains and floods, there has been a re – emerging of landslides, which have revived older ones, also affecting (mostly) new pasture areas,(or less) agricultural land and grass – lands. Linear erosion, without any serious consequences, affects the lands of Ruştior, Ardan and Lunca towns, but are particularly intense in the upper basin of the Valea Domnească river (around the Sebiş village), respectively at the springheads of the branching streams on its right side.

2. 2. The Middle Şieu River Valley. Presents the most complex issues in terms of slope process` variety and areal extension, in the range of the Şoimus, Şieu, Sântioana and Bârla settlements and several annex hamlets. On the left axis of the valley, due to the forests descending

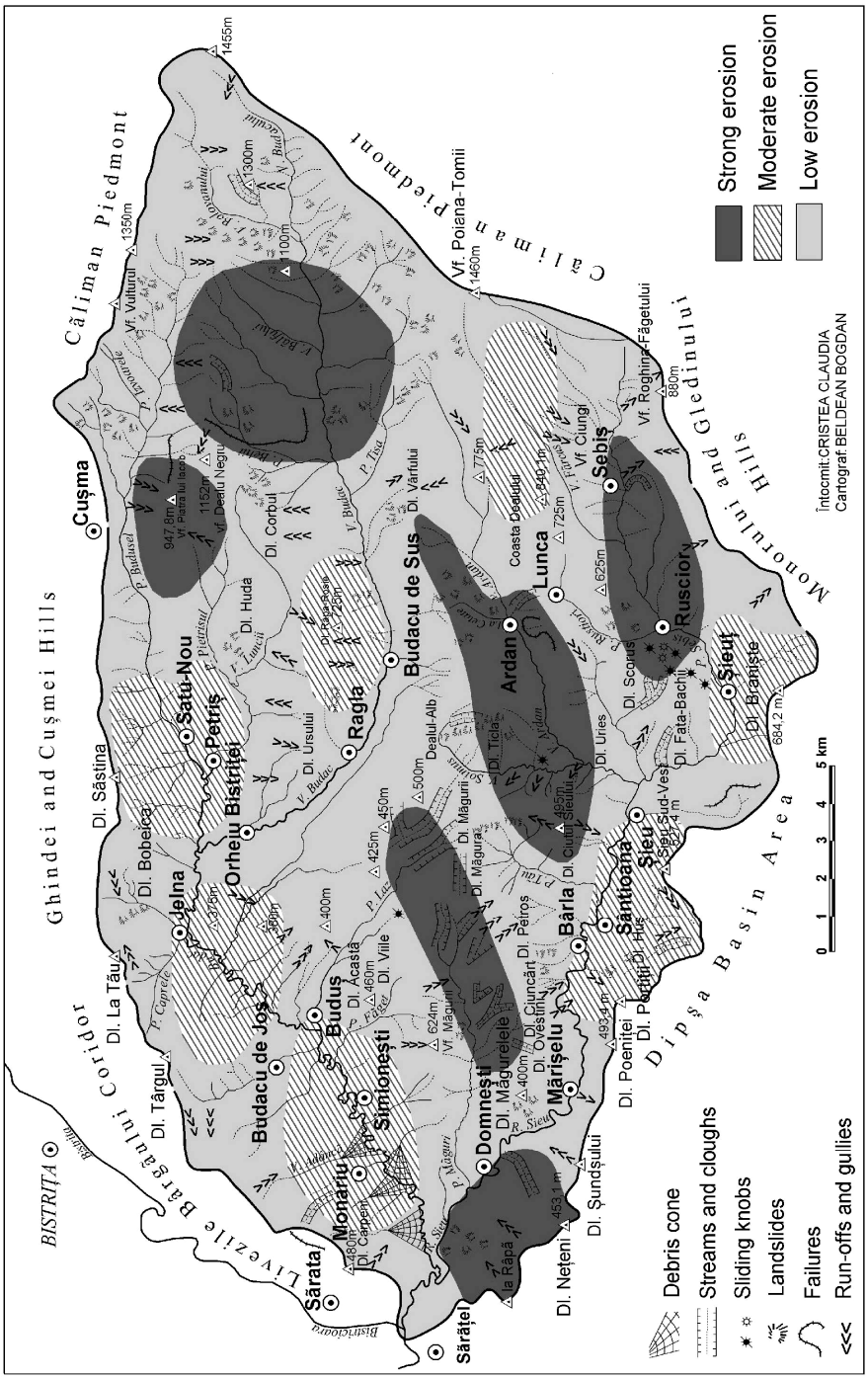


Fig. 1. Slope processes in the Şieu River Basin.

of the Şieu slope, degradation processes are restricted to the deforested areas of the Sud – Vest Şieu Hill, Hus Hill, Portiții Hill, Poieniței Hill, where areal erosion and landslides are prevalent, very extensive in Sântioana.

On the left side, the forests occupy scattered areas, in the Ciutul Şieului Hill and Țicla, Măgura and Petros Hills. Landslides and subsidence, combined with the intense denudation of the south and western facing slopes, predominantly destined to grazing, are found in the Şoimuş and Tău Valleys, the gully erosion being insignificant here (except for a few stronger torrents, at the southern extremity of the Măgurii Hill, the northern extremity of the Oveştini Hill and in the north part of the Petros Hill).

2. 3. The Lower Şieu River Basin. It shows many similarities with the previously described area, but on a much smaller area, having only two settlements – Mărişelu and Domneşti. The forests, owing about 18% of the total area, occupy the slope ridges, also protecting the surrounding areas against erosion. Overall, the areal sweep is prevalent, on the south facing slopes (Măgurele Hill, the Măgurii Valley river basin) and seldom on the west facing slopes, the latter also being affected by old landslides (the Şunduş Hill, the Neţeni Hill), reactivated by the excess moisture in the 1970`s, when a few dozens of vineyard hectares were destroyed, even from the recent plantations.

2. 4. The Junction Area of The Budacului and Şieu Valleys. It is limited within the territory of the Sărata and Sărățel villages (with a high urbanization tendency**)** and affects almost exclusively the right side of the Măgurii Valley and the junction ridge, on plats destined to pastures and crop lands. The wide spread of vineyards (7% of the total county area) and of orchards (5%), determined the more rational use of slope lands. However, at Monariu, current processes are very active (areal sweep and linear erosion, moderate and strong) and at Sărățel also the landslides after the 1970`s rains can be added:1970, 2003, 2008, 2010.

2. 5. The Pintic – Poşmuş Chute. With a liaison function between Teaca and the Şieu river valley, through the Poşmuş saddle, shares many similarities with the previous area: forests on both slope ridges of the Pintic Valley, more uniform on the right side and more fragmented on the left one, arable lands and pastures in the Poşmuş – Pintic sector, to which are added orchards and particularly vineyards, in the Pintic – Teaca sector.

In the upper basin of the valley, the areal sweep is felt (on the right side), combined with medium - scale landslides, and torrential erosion on the left, subject to un – organized grazing. In the lower basin, at Teaca, the phenomena are more complex, combining all forms of degradation. Only at the Teaca I.A.S., there are in different stages of degradation, 1 238 ha of land, of which 454 ha with surface erosion and 12 ha with torrential erosion. The restoration measures have imposed agro – terraces on 685 ha of ploughable land, 42 ha of grassland, 15 ha of vineyards and 8 ha of orchards.

The particular intensity of current processes is conditioned by the high percentage (about 50%) of the declivous lands (at more than 15° - 30˚ or even over these values). Reactivations of the landslides occurred here in May – June 1970, 1998.

2. 6. The Budac River Basin. Highly branched, it had enabled the emergence of some old villages (Budacu de Sus, Ragla, Dumitrița), sheltered by the surrounding forests, which occupy almost all the major slope ridges. The dominant slope processes are those of

areal sweep, largely extended in the areas dedicated to grazing, (Orheiu Bistriței, Jelna, Buduș), also in the south – east of Buduș strong torrents appear, here and there having remarkable depths (up to 3 – 4 m). To the south – west of Ragla - landslides can also be added, with the separation offset just below the forest edge, which shows that deforestations should be entirely banned.

2. 7. The Buduşelu River Basin. Represents the last area with a more pronounced degradation (strong erosion and landslides) on the south – western facing slopes and occupied by pastures, vineyards and orchards. Their generalization on some of the slopes is also related to the slope`s medium and high declivity values (15° - 45°). In the rest of the basin, and especially in the Cuşma-Satu Nou-Petriş area, although most of the land is represented by arable land, the low slopes and the proper organization and territory maintenance, have as a result the much lower percentage of degradation, the only area affected by erosion that is moderate to strong erosion, being the Izvoarele-Vulturul sector. As a result to the intense movement of cattle and sheep towards the pastures and drinking areas, the Pietrişul and Luncii Valleys are affected by moderate erosion.

3. MEASURES AND TERRITORIAL PLANNING WORKS

Given this situation, the abidance and organization of new measures is imposed, in order to re-integrate into the economic network of all the degraded or degrading areas. The complex of measures and woks to improve and enhance the eroded grasslands, include territorial planning, works to restore the vegetation cover, works of retention or discharge of water from the slopes and rational organization of grazing. It is required that the grazing should take place on rectangular grass fields, with a parallel orientation to the contour lines; to ensure water for animals from the closest grass field, so that there is no need to carry the animals from one slope to another, thus contributing to the destruction of the vegetation cover (for example Ardan, Şoimus, Buduş, Bârla, Petriş).

The restoration of the vegetation cover, located on the sloping pastures, through over-seeding or re-seeding, represents an effective means to stop soil erosion. To retain or remotely discharge of the extra volume of water from the slopes, derived from rain or melting snow and which is an important element in the onset and development of soil erosion, a series of works are required: fluting, scoops made with rollers and special machines, bush bands, erosion curtains, plantations in the mountains. Fluting represents a means of water retention, which can also be applied on moister – deficient pastures. It must be made parallel to the contour lines. It's not advisable to use fluting on pastures with landslides, in run – off and gullies areas and on surfaces where the grass cover is destroyed (the Domneşti pastures, Şieu pastures, the downstream side of the Lunca pasture). On these pastures the pits should be done with tooth – rollers and special machines, in order to retain storm water. The holes, evenly distributed on the pasture's surface, can be made with a heavy roller, provided with teeth and with a plough fitted with alternating discs.

This method has not yet been applied here, but it would be very useful for grasslands in drier areas, making possible the more efficient use of water from precipitation. In pastures with cloughs good results are obtained by applying over – sown land waves, which prevent water concentration and the increasing of gully erosion (e.g. Şoimuş Hill, Şieuț Hill, Măgura Hill and Petros Hill).

Erosion curtains or plantations on the massif are indicated only on pastures with very strong erosion processes in order to delimit them, as well as for stabilizing the existing soil cover.

The control of gully erosion requires the establishing of specific criteria in choosing the appropriate measures for each form of gully erosion, also depending of the area`s land usage. The agricultural use as pastures, grasslands and vineyards or orchards, of the land, requires the making of best conditions for conducting all agro – technical and hydro – improvement works. In this respect the not so sharp subsidences, run – offs and the small gully , must be balanced. By levelling the drainage ditches of streams and gullies are neutralized, preventing the concentration of leakage and hence their evolution. Highly eroded surfaces, which can not receive other use, will be afforested with adequate essences, which seem to resits such climatic and soil conditions, in order to e able to firmly stabilize the land (Măgurele Hill, Alb Hill, Corbul, La Râpa).

Fig. 2. Non – consolidated clough between Domneşti and Mărişelu, on the left bank of the Şieu River.

The gullies that can not be levelled, as well as ravines with running water works, will be fixed through afforestation, once with the tops of ravines. For the cloughs and streams of the Şieu river basin, measures to strengthen the banks as well as their riverbed, are asserted. The banks of gullies must be planted with species that strongly produce sprouts, as a series of cloughs in Bârla, on the right side of the Şieu Valley and others have been consolidated.

A form of land degradation that affects, as stated above, the upper middle basin of the Şieu river valley, is represented by landslides. Due to the high damage they cause, a series of measures must be taken to fix it. For this purpose narrow terraces (0,5 – 1 m) will be created, at a distance of 2- 3 m one from the other and stregthened by wattle fences or walls.

Lands that are exposed to landslides are not suitable for agricultural use (vineyards or pastures), but must be afforested with water retaining species, rapidly increasing plants (willow, poplar, ash).

Surface water must not be stagnant, but should be directed to the slope`s base through outlets. In the case of Jelna, Ardan, Mărişelu, Petriş etc. Landslides, measures should be taken to stabilize and prevent their development (drainage, retaining walls – with filter and barbacan*)*.

On such lands it is wise to avoid the building of constructions, warehouses etc.

Fig. 3. Landslides at Râpa cu Păpuşi – Domneşti, right bank of the Şieu river.

Fig. 4. Landslides in the lower Şieu River Basin.

4. CONCLUSIONS

In conclusion, the main measures and works to combat soil erosion in relation to the slope are:

- on lands with slopes between 3° - 10°: crops sown in the direction of the contour lines; the sowing of corn in sutters. On slopes greater than 8° the strip crop system is used;

-on lands with slopes between 11° - 20°: the strip culture system, the intercropping of legumes with maize, with reducing, in some situations, the proportion of drills;

- slopes between 21° - 30°: protection crop rotations; agro – terraces. Arable areas are fewer. The strip culture system or grass strips are applied. Slopes higher than 20° are planted with fruit trees and vineyards.

The gullies and cloughs are forested, reducing the areas planted with corn; eroded soil fertility increases. As the upper limit of arable land, the approx. 30° slope is considered.

Grazing should be well maintained, not abusively cleared. These measures would greatly contribute to the increase of the agricultural production and the retaining of various forms of slope processes.

R E F E R E N C E S

1. Gârbacea, V., (1956), *Dealurile Bistriței. Studiu gemorfologic*, Teza de Doctorat, Cluj-Napoca.
2. Gârbacea, V., (1961)*, Considerații cu privire la evoluția rețelei hidrografice în partea de NE a podișului Transilvaniei (Dealurile Bistriței)*. Studia Universitatis Babeş-Bolyai, Geologia-Geographia, II, 1.
3. Marinescu, Fl., Peltz, S., (1968), *Harta geologică 1:200000*, foaia11, Bistrița, Institutul Geologic.
4. Morariu, T., Gârbacea, V., (1968), *Studii asupra proceselor de versant din Depresiunea Transilvaniei*. Studia Universitatis Babeş-Bolyai, Geographia, I.
5. Pop, P. Gr. (2001), *Depresiunea Transilvaniei*, Edit. Presa Universitară Clujeană, Cluj-Napoca, 2001.
6. Rădoane, Maria, Rădoane, N., Ichim, I., Surdeanu, V. (1999), *Ravenele - forme, procese, evoluție,* Edit. Presa Universitară Clujeană, Cluj-Napoca.
7. Rădoane, N. (2002), *Geomorfologia bazinelor hidrografice mici,* Edit. Universității Ştefan cel Mare, Suceava.
8. Surdeanu, V., (1986), *Alunecările de teren ca surse de aluviuni*. În Proveniența și Efluența Aluviunilor, vol. 1, Piatra Neamț.
9. Surdeanu V., Zemianski Sanda,(2005), *Rapports entre les processus de versant et la dynamique des alluvions dans les petits bassins hydrographiques*. Travaux de l`Institut de Géographie de Reims , nr. 123-124, 2005.
10. http://www.primariabistrita.ro
11. http://www.prefecturabn.ro

Note: Investing in people! SECTORAL OPERATIONAL PROGRAMME HUMAN RESOURCES DEVELOPMENT 2007 – 2013 Priority Axis 1 „Education and training in support for growth and development of a knowledge based society". Key area of intervention 1.5: Doctoral and post-doctoral programmes in support of research. Contract SOP HRD/6/1.5/S/3. Project Title: „Doctoral studies: through science towards society".

STUDIA UBB GEOGRAPHIA, LVI, 2, 2011

GIS METHODOLOGY FOR THE CALCULATION OF PROBABLE PEAK DISCHARGE TIME OF CONCENTRATION IN SMALL DRAINAGE BASINS. CASE STUDY

ŞT. BILAŞCO[1]

ABSTRACT. – GIS Methodology for the Calculation of Probable Peak Discharge Time of Concentration in Small Hydrographic Basins. Case Study. The model proposes a methodology for the calculation of the time of concentration using geoinformation software. Water run-off on slopes depends both on their configuration and on the collected water volume and in this way the slope flow characteristics differ very much from one drainage basin to another. At the same time, the period during which the flood flows on the drainage basin's area is extremely important in the warning and evacuation process in order to avoid eventual disasters. While the estimation of the time of concentration on the base of empiric equations is time-consuming, the proposed model integrates the numerical and spatial databases specific to the hydrologic models into a spatial analysis formula with the help of ArcGis software extensions, in this way the computation and spatialization of the time of concentration becoming time-efficient.

Keywords: *methodology, G.I.S., time of concentration, database.*

1. INTRODUCTION

The time of concentration appears in numerous equations that compute the peak discharge, being absolutely necessary in the utilization of the rational method that calculates this parameter in small drainage basins.

Each drainage basin is characterized by particular values of the time of concentration, in relation to the conditions that determine water flowing on slopes or river channels. There are many ways in which water may flow, laminary on some slopes, in pluvial drainage channels on others or concentrated in river channels etc., the attempts to determine the time of concentration having to consider all these water flow types.

The presented case study is a continuation and completion of the G.I.S. model proposed by Bilaşco, 2010, with implementation on the same drainage basins located in the Cluj Hills – the drainage basin of a first order tributary of the Nădăşel River and the second one, the drainage basin of the first order tributary of the Sălişte River (Bilaşco, 2010). The used databases reffer to the maximum water volumes and were completed during the application of the previously proposed spatial analysis model.

[1] *Romanian Academy, Cluj Branch, Department of Geography, 400015 Cluj-Napoca, Romania, e-mail: sbilasco@geografie.ubbcluj.ro*

2. THEORETICAL CONSIDERATIONS

The literature in the field proposes numerous formulas to estimate the time of concentration, the most popular being: Wave Method, Kirpich formula (1), Kerby formula and NRCS Velocity Method (2).

The time of concentration is defined as the time needed for water to flow from the most remote point of the hydrographic basin to the calculation section.

Another definition given to the time of concentration, and maybe the most complete, is that it represents the time during which water drops from rainfalls with maximum intensity on the entire drainage basin contribute simultaneously to runoff, from their formation point to the point under investigation.

The calculation of the time of concentration is based on two main components: the time of concentration on slope and the time of concentration in the flowing channel (main channel, tributaries' channel, pluvial drainage channel etc.).

The Kirpich formula

$$t_c = 0.0078 * L * \left(\frac{L}{H}\right)^{0.385} \qquad (\min ites) \tag{1}$$

where:

t_c – time of concentration (minutes);

L – maximum length of the flowing channel;

H – altitude difference between the highest and the lowest point in a drainage basin.

The method is applicable only on drainage basins with insufficient available data, as the method does not take into consideration the time of concentration on slopes and, as a result, it is used only in case of small drainage basins, while for larger ones the calculation of the time of concentration with this formula gives significant errors.

NRCS Velocity Method

This is one of the most common methods, being the most appropriate to geoinformation software and giving the most accurate results in computing the time of concentration of water volumes.

The calculation of the time of concentration of water is based on the following formula and takes into account three main parameters: length of the main channel, computed peak discharge and inclination of the flowing channel.

$$t_c = \frac{L}{0.6} \qquad (ore)$$

$$L = \frac{L_a^{0.8} * (S+1)^{0.7}}{1900 * \gamma^{0.5}} \qquad (ore) \tag{2}$$

where:

t_c – time of concentration in hours; L_a – length of the drainage channel;

S – water retention potential; Y – inclination in degrees.

3. G.I.S. METHODOLOGY

In order to calculate the time of concentration we have used the NRCS method, equation (2), considering that it encompasses the main factors that may affect the value of this indicator.

3. 1. Database

The necessary database was created by using the thematic layers representing the peak discharge, the flowing channel inclination and the flowing channel length (table 1).

Specific database

Table 1

Thematic layer	Format	Attribute
Peak discharge	GRID	m^3
Inclination	GRID	%
Flowing channel length	Alphanumeric	km

The flowing channel length represents the alphanumeric database that identifies, in km, the longest flow route of water within a drainage basin (fig. 1 and 2) and was worked out automatically (as input data we had the DEM and the watershed of the basin whose length we intended to calculate) with the help of the function Longes Flow Path for Catchments, HydroTools 9 extension, ArcGIS software.

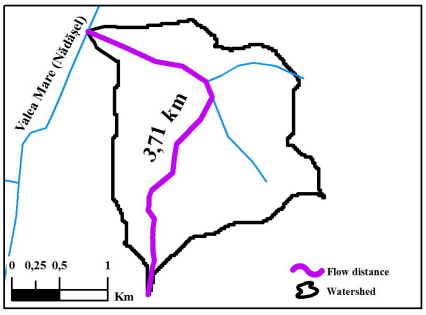


Fig. 1. Drainage channel (Nădăşel tributary).

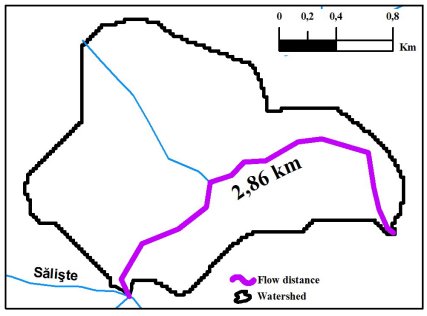


Fig. 2. Drainage channel (Sălişte tributary).

The inclination value influences the time of concentration of water into the main flowing channel, a higher slope inducing a shorter time of concentration, while a lower slope, a longer time of concentration. As the inclination of the flow channel increases, the time of concentration will tend to zero. At the same time, the time of water concentration on slopes is also influenced by the slope gradient. In case of large areas with steep slopes, the time of concentration will be short, the runoff tending to be torrential, while on less inclined slopes, the time of concentration will increase.

The peak discharge may be identified as a GRID database representing the drained water volume (fig. 2) for which the time of concentration is computed. The peak discharge was calculated through the SCS-CN model.

3. 2. Spatial analysis

After analyzing all the calculation formulas for the time of concentration, we have decided to use the NRCS Velocity Method. The spatial modelling of the time of concentration requires some adjustments of the mathematical spatial modelling techniques which reffer mainly to the processing of the thematic layers by some equations and functions that should generate new attributes stored in other thematic layers (fig. 5).

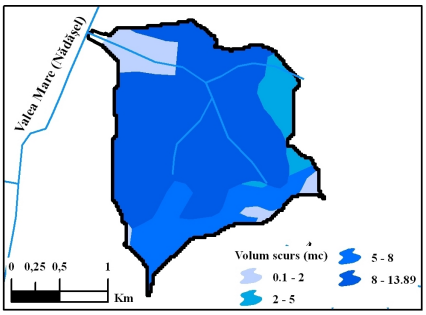


Fig. 3. Peak discharges (Nădăşel tributary).

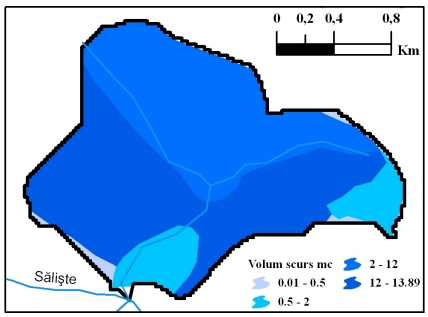


Fig. 4. Peak discharges (Sălişte tributary).

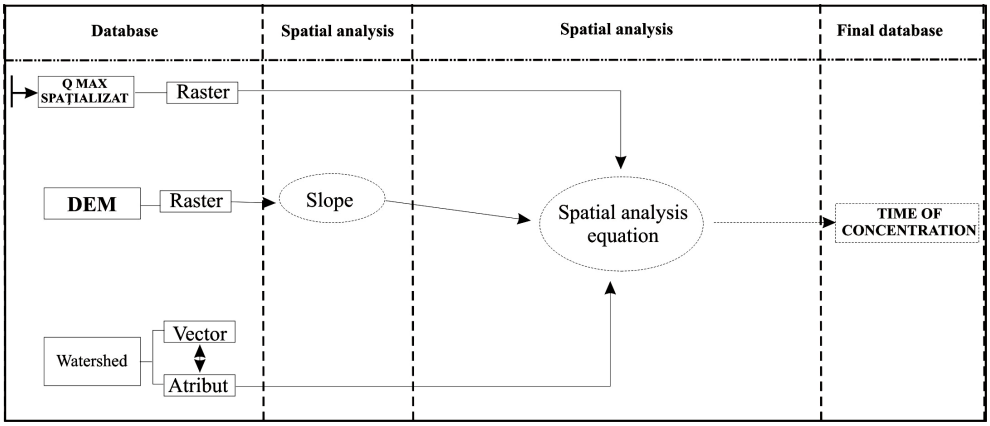


Fig. 5. Spatial Analysis Model.

In order to develop the spatial modelling, we have used the ArcGIS software, extension Spatial Analyst, Raster Calculator function, which allows the working out of the cartographic modelling overlay as a combination between raster and alphanumeric databases with the help of some spatial analysis equations.

The spatial analysis equation that we have used in computing the time of concentration, after adjustments, has reached the following form:

$$((Pow(L_a, 0.8) * Pow((1000 / [Q]) - 9, 0.7)) / (4407 * Pow([panta\%], 0.5))) * 60.$$

The NRCS Velocity Method makes possible the calculation of the time of concentration in hours and thus the obtained value was multiplied by 60 with the purpose that the time of concentration is given in minutes and in this way it could be integrated into the rational calculation formula.

4. RESULTS AND CONCLUSIONS

The database that was achieved through this modelling is expressed in the form of two thematic layers in GRID format (fig. 6, 7) representing the time of concentration for the collected water in the territory of the two analyzed drainage basins (table 2).

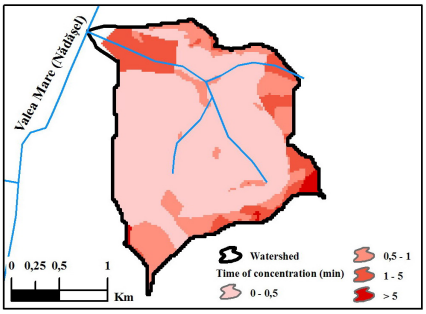


Fig. 6. Peak Discharges (Nădăşel tributary)**.**

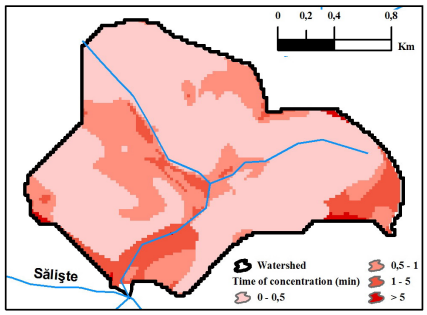


Fig. 7. Peak Discharges (Sălişte tributary).

A comparison between the time of concentration computed data was not possible, as the minimal, average and maximum values reffer to the water volumes and not to the entire drainage basin.

Time of Concentration Characteristics

Table 2

Name of the drainage basin	Length of the flowing channel (km)	Modeled time of concentration (minutes)			Slope length (m)	Computed time of concentration (minutes)
		Minimal	Average	Maximum		
Nădăşel tributary	3.71	0.14	0.65	30.79	113.91	4.88
Sălişte tributary	2.86	0.14	0.42	169.37	98.01	5.14

We have also undertaken an analysis of the percentage manifestation of the studied indicator, taking into account that the modelling highlighted low values for the minimal time of concentration, high values for the maximal time of concentration in the case of some drainage basins and low values for the average time of concentration (Table 2), corresponding to a very decreased percentage in the case of the maximal time of concentration (0,9 - 2 % above 5 minutes) and an increased one in the case of the characteristic (minimal and average) time of concentration (sharing around 90% of the studied territory).

4. 1. Procedures to validate the time of concentration

Once we obtained the modelled time of concentration, we proceeded at the direct calculation of the time of concentration in order to compare the results and identify the areas in which the modelled time of concentration is similar to the directly calculated one.

The modelled results pointed out for the Nădăşel drainage basin large areas with time of concentration under 5 minutes (98% of the total basinal area) - 0-0,5 67%, 0,5-1 17%, 1-5 14% - and small areas with time of concentration above 5 minutes. The Sălişte drainage basin is also characterized by large areas with time of concentration below 5 minutes - 0–0,5 65,5%, 0,5-1 23%, 1-5 10,6% - and small ones with time of concentration above 5 minutes - 0,9%.

As regarding the calculated values, we obtained a time of concentration of 4,88 minutes for the first drainage basin and 5,14 for the second one. These values were used as reference points in order to validate the accuracy of the proposed model. The comparison between the calculated and the modelled results highlighted that in the most of cases the modelled values of the time of concentration was quite similar to those calculated in the traditional way, fact that mirrors and prove the accuracy and the validity of the proposed spatial analysis model. Some overrunning values of the modelled results were noticed, the explanation being attributed to the grid overlay analysis in which some cells could intercept the extreme variation in slope and discharg within a certain area, taking into account the 20 m resolution of these layers.

R E F E R E N C E S

1. Bilaşco, Şt., (2008), *Implementarea GIS în modelarea viiturilor de versant*, Edit. Casa Cărţii de Ştiinţă, Cluj-Napoca.
2. Bilaşco, Şt., (2010), *Calculation of maximum funoff volume induced by torrential rainfalls trought the G.I.S. SCS-CN method. Case study: the small hydrographic basins in the Shouth and West of the Somesan Plateau*, Studia UBB, 1/2010
3. Haidu, I., (1993), *Evaluarea potenţialului hidroenergeticnatural al râurilor mici. Aplicaţie la Carpaţii Maramureşului şi Bucovinei*, Edit. Gloria în colaborare cu RENEL, Cluj
4. Wanielista, M., Kersten, R., Eaglin, R., (1997), *Hydrology water quantity and quality control*, Joh, Wiley and Sons. 2nd ed.

Note: This work was supported by CNCSIS –UEFISCSU, project number PNII – IDEI 2549/2008.

STUDIA UBB GEOGRAPHIA, LVI, 2, 2011

THE PARTICULARITIES OF CLOUDINESS IN THE APUSENI MOUNTAINS

OVIDIU GACEU[1]

ABSTRACT. – The particularities of cloudiness in the Apuseni Mountains. The following paper describes the characteristics of atmospheric influenced cloudiness in the Apuseni Mountains, based on daily weather data collected between 1960 and 2009 from 9 weather stations situated in this area. The data have been processed according to the traditional methodologies used in the climatological practices, thus determining the total and low cloudiness values, the number of overcast and sunny days as well as the frequency of different types of clouds. The values registered have been included in a table on the basis of which several diagrams have been drawn out and analyzed correspondingly. The results thus obtained are synthetically expounded as part of the conclusion of this study.

Key words: *cloudiness, regime, frequency, type of clouds, the Apuseni Mountains*.

1. GENERAL ASPECTS

According to their shape, size, duration and structure, clouds engender changes in the evolution of other climatic elements, also influencing the normal development of life. Therefore, clouds determine the quantity of rainfall for a given area, reduce the intensity of solar radiation during daytime and decrease the intensity of effective radiation during nighttime, thus determining the moderation of temperatures.

2. CLOUDINESS REGIME

2. 1. The average monthly and annual cloudiness

By analyzing the values *total cloudiness*, (sky coverage taking into account all the clouds existing at the moment of observation) registered by the nine weather stations of the Apuseni Mountains area, it is noticeable that the *annual values* proportionally increase with altitude, from 5.7 tenths registered at the foot of the mountain (Ştei), to 6.8 tenths on the highest peaks (Vlădeasa 1800) (table 1, fig. 1).

One notices that the values of total cloudiness differ from mountainside to mountainside at the same altitude level. Thus, on the northern and north-western slopes exposed to the main direction of the air mass movement, the total cloudiness is accentuated (6,0 tenths registered at Stâna de Vale station), due to the intensification of the frontal activity, while on the more sheltered eastern and south-eastern slopes, the descent of the air masses engenders the disintegration of cloud systems (5.8 tenths registered at Băişoara) (fig. 1).

[1] *University of Oradea, Faculty of History, Geography and International Relations, Oradea, Bihor, România, e-mail: gaceu@yahoo.com*

By observing *the monthly development of the total cloudiness* one notices that in the lower half of Bihor and Vlădeasa Mountains (Gurahonţ, Borod, Huedin, Câmpeni weather stations) the highest values are registered during winter in December (7.1-7.3 tenths), when thermodynamic processes are alleviated. As a result, the air cooled on the peaks accumulates at the foot of the mountains, determining the emergence of thermal inversions which influence the development of the stratus clouds and of haze. These conditions are paralleled by the intensification of the Mediterranean cyclonic activity which carries humid and unstable air masses bearing numerous condensation products. Thus, high altitude regions are sunnier during winter (6.0-6.9 tenths), registering a maximum value of cloudiness in *April* (6.5-7.4 tenths) when western air-mass circulation is predominant and thermal convection intensifies, determining an increased evaporation process at the surface of the damp soil.

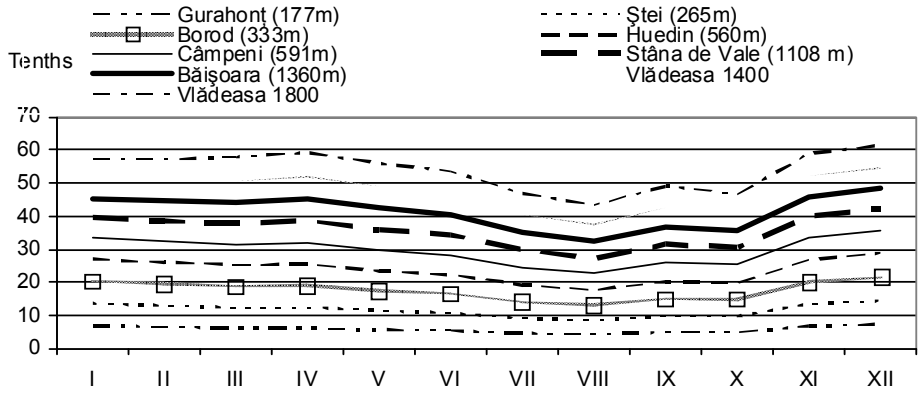
The average monthly and annual cloudiness (tenths of sky coverage) in the Apuseni Mountains

Table 1

Station	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Year
Gurahonţ	6.9	6.5	6.2	6.3	5.6	5.4	4.5	4.3	4.9	4.9	6.7	7.3	5.8
Ştei	6.7	6.5	6.2	6.2	5.8	5.3	4.6	4.2	4.8	4.8	6.6	7.1	5.7
Borod	6.8	6.6	6.4	6.5	6.1	5.8	5.0	4.6	5.3	5.2	6.8	7.2	6.0
Huedin	6.6	6.5	6.4	6.5	5.9	5.8	5.0	4.6	5.1	4.9	6.7	7.2	6.0
Câmpeni	6.3	6.2	6.0	6.4	6.1	6.0	5.4	5.1	5.7	5.4	6.5	7.1	6.0
Stâna de Vale	6.3	6.2	6.7	6.8	6.4	6.1	5.3	4.7	5.6	5.4	6.4	6.5	6.0
Băişoara	5.7	6.0	6.3	6.5	6.4	6.1	5.4	5.0	5.3	4.9	5.9	6.0	5.8
Vlădeasa 1400	5.4	5.6	6.4	6.6	6.5	6.3	5.2	4.9	5.8	5.2	6.3	6.1	5.9
Vlădeasa 1800	6.5	7.0	7.3	7.4	7.2	6.9	6.5	6.0	6.5	6.0	7.0	6.9	6.8

Source: Data provided by the archive of the National Agency of Meteorology.

Fig 1. The monthly and annual development of the total cloudiness in the Apuseni Mountains.



The lowest values of total cloudiness are registered for all the altitudes at the end of the summer, in August, when the anticyclonic regime is predominant and high levels of isolation determine the evaporation of condensation products, the sky remaining overall sunny: 4.2-4.6 tenths registered at low altitudes (Gurahonţ, Ştei, Borod, Huedin), 4.7-5.0 tenths at average altitudes (Stâna de Vale, Băişoara) and 6.0 tenths on the highest peaks (Vlădeasa 1800) (fig.1).

Low cloudiness (the degree of sky covered with low clouds) corresponds to *annual average values* which differ according to altitude and local conditions. Thus, an increase of the value of low cloudiness is generally noticeable: from 2,9-3,8 tenths registered at low altitudes (Borod, Ştei, Gurahonţ) up to 5,1 tenths on the highest peaks (Vlădeasa 1800).

Average monthly and annual low cloudiness values (tenths of covered sky) in the Apuseni Mountains

Table 2

Station	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Year
Gurahonţ	4.8	4.1	3.6	3.8	3.6	3.7	3.1	2.9	3.1	3.1	4.5	5.2	3.8
Ştei	4.0	3.6	3.1	3.4	3.4	3.2	2.8	2.4	2.5	2.3	3.8	4.5	3.2
Borod	3.3	3.1	2.6	3.1	3.0	3.1	2.6	2.2	2.4	2.1	3.3	4.0	2.9
Huedin	4.6	4.1	3.7	4.1	3.9	3.9	3.4	3.0	3.2	2.8	4.5	5.2	3.9
Câmpeni	4.5	4.4	4.1	4.6	4.8	4.9	4.5	4.3	4.5	4.0	4.9	5.5	4.6
Stâna de Vale	3.6	3.6	3.5	3.9	3.8	3.8	3.3	2.9	3.3	2.7	3.5	4.0	3.5
Băişoara	3.6	4.0	4.1	4.5	4.6	4.7	4.1	3.7	3.7	3.1	3.9	4.1	4.0
Vlădeasa1400	3.7	3.8	4.2	4.4	4.6	4.5	3.7	3.5	3.9	3.2	3.7	4.1	3.9
Vlădeasa 1800	4.7	5.1	5.4	5.4	5.4	5.5	5.2	4.6	4.9	4.2	5.0	5.4	5.1

Source: Data provided by the Archive of the National Agency of Meteorology.

However, this stratification is e disrupted by local conditions (natural depressions which favor the occurrence of thermal inversions maintaining low, stratus cloud systems) as is the case of Huedin and Câmpeni weather stations, determining higher values of low cloudiness than those registered at average altitudes: 3.9-4.6 tenths as opposed to 3.5-4.0 tenths at Stâna de Vale and Băişoara (table 2, fig. 2).

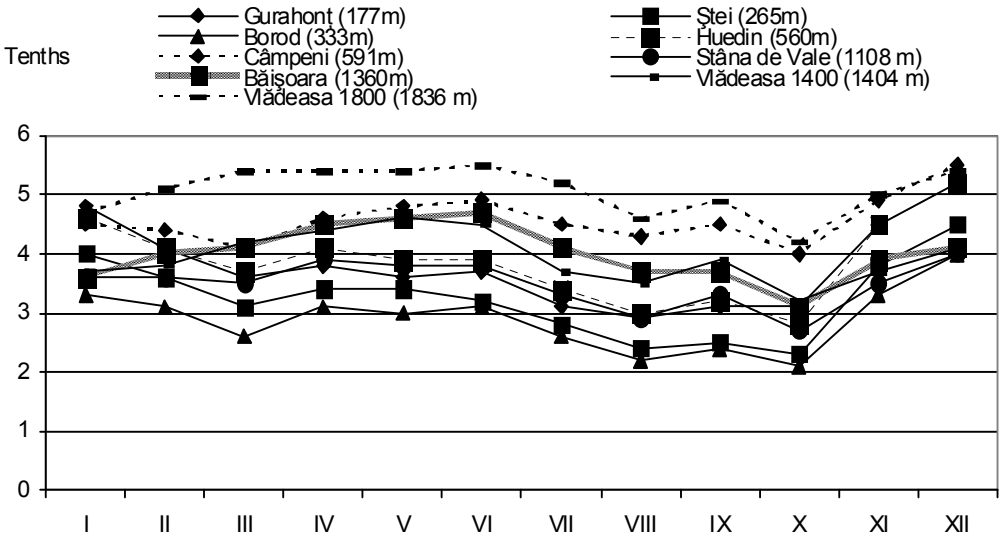


Fig. 2. Annual and monthly development of low cloudiness in the Apuseni Mountains.

The monthly development of low cloudiness is similar to that of total cloudiness: weather stations located on the lower half of Bihor and Vlădeasa mountains register the highest values during winter, in *December* (4.5-5.5 tenths), while those situated on the upper half of the studied area, the highest values of low cloudiness are registered during the end of spring and the beginning of summer in *April-May* (4.5-5.5 tenths) (fig. 2).

The inferior values of low cloudiness are also registered for all altitudes during the end of the summer, in *August,* oscillating from 2.2 tenths at Borod and 4.6 tenths at Vlădeasa 1800.

2. 2. The number of sunny and overcast days

The degree of sky coverage is variable and differs considerably from one day to another. In order to estimate this variability as correctly as possible, two types of days have been conventionally defined, according to the daily average coverage value (the calculated average of the four values measured at the fixed hours of observation: 0, 6, 12, 18): sunny and overcast days.

The monthly and annual average number of sunny days in the Apuseni Mountains

Table 3

Station	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Year
Gurahonţ	3.7	4.2	4.4	3.0	3.2	4.4	7.1	8.6	6.8	7.3	3.6	2.8	58.9
Ştei	4.1	3.9	4.5	3.2	2.9	3.7	7.0	8.7	7.3	8.5	3.7	3.5	61.0
Borod	3.5	3.7	3.4	2.8	2.5	3.3	6.2	6.8	5.2	6.8	3.4	3.0	50.5
Huedin	3.9	3.9	3.4	2.8	2.5	3.1	5.2	7.1	5.8	7.9	3.1	2.9	51.6
Câmpeni	5.0	4.4	4.2	3.0	2.0	2.0	3.4	4.1	2.6	3.9	3.5	3.5	41.5
Stâna de Vale	5.7	5.2	3.1	2.0	1.8	2.4	4.0	6.3	5.1	7.0	4.8	5.0	52.5
Băişoara	5.6	4.2	3.6	2.3	1.7	1.3	2.9	4.5	4.9	7.8	4.6	5.1	48.4
Vlădeasa1400	6.0	5.2	3.7	2.7	2.1	1.2	4.3	6.1	4.1	7.1	4.8	5.7	53.1
Vlădeasa1800	5.2	3.7	3.0	1.6	0.9	0.9	2.0	2.7	3.1	5.6	3.3	4.7	36.6

Source: Data processed according to the archive of the National Agency of Meteorology.

The highest *annual average of sunny days (*a sunny day is considered so only when the sum of the four cloudiness values registered daily does not exceed 4 tenths) has been registered in the area studied at Ştei weather station (61), while the lowest average is registered at Vlădeasa 1800 (36.6) (table 3, fig. 4).

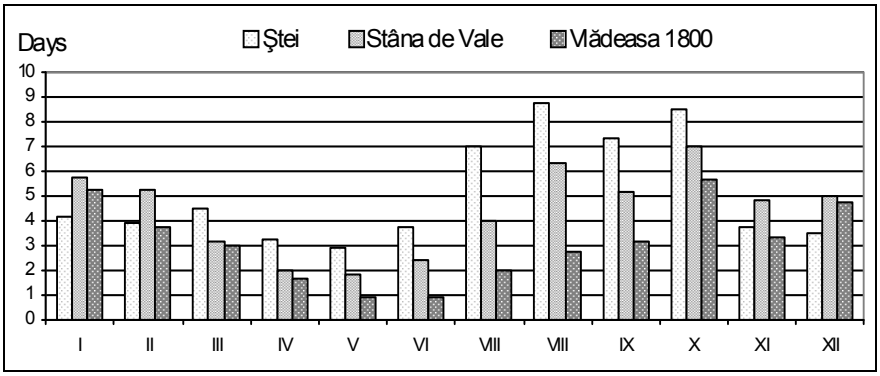


Fig. 3. Monthly average number of sunny days in the Apuseni Mountains.

Throughout the year, the *highest monthly average number of sunny days* is registered in August, for low and medium altitudes (8.7 days at Ştei, ,8.6 days at Gurahonţ, 7.1 days at Huedin, 6.3 days at Stâna de Vale) and in October in high altitudes (7.1 days in Vlădeasa 1400, 5.6 days at Vlădeasa 1800), due to the anticyclonic regime which manifests at the end of the summer and the beginning of autumn (table 3, fig. 3).

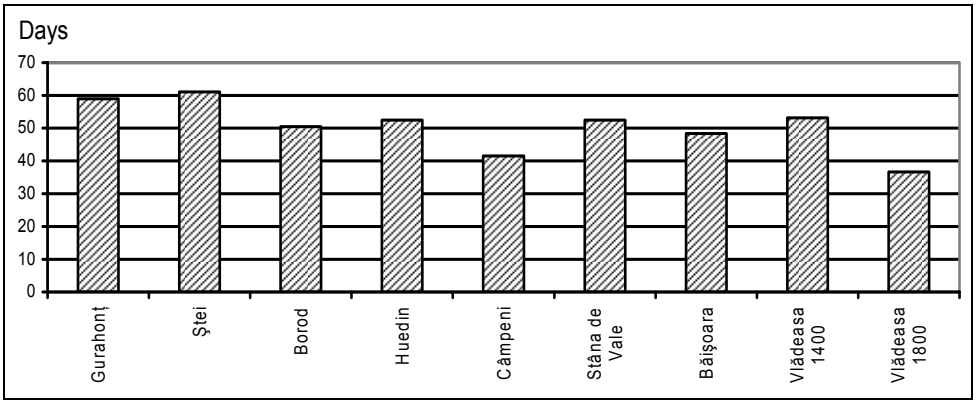


Fig. 4. Annual average number of sunny days in the Apuseni Mountains.

The lowest monthly average number of sunny days is registered in December by the foot of the mountains (2.8 days at Gurahonţ, 3.0 days at Borod, 3.5 days at Ştei), due to the winter anticyclonic regime, or, sometimes, because of the intensification of the oceanic air-mass movement in May-June at over 1000 m altitude (1.8 days at Stâna de Vale, 1.3 days at Băişoara, 1.2 days at Vlădeasa 1400, 0.9 days at Vlădeasa 1800), as a result of the amplification of thermodynamic convection processes (table 3, fig. 3).

The annual and monthly average number of overcast days in the Apuseni Mountains

Table 4

Station	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Year
Gurahonţ	14.2	11.0	10.4	9.9	7.3	6.3	4.8	4.3	6.5	6.8	12.5	16.2	110.0
Ştei	13.5	11.0	10.5	9.5	7.4	6.0	4.5	4.1	5.9	6.2	12.1	15.4	105.8
Borod	13.3	11.7	10.3	10.8	8.1	7.0	5.7	4.7	6.4	7.8	13.1	15.3	114.2
Huedin	13.1	11.4	11.2	10.8	8.9	7.3	5.1	4.5	6.5	7.0	12.7	15.4	113.9
Câmpeni	12.7	10.4	10.3	10.0	8.9	6.9	5.6	4.8	6.4	7.1	11.7	15.7	110.3
Stâna de Vale	13.0	11.1	12.3	11.5	10.0	8.1	7.1	5.4	8.0	8.4	12.2	13.1	120.2
Băişoara	8.9	9.7	10.9	10.4	8.7	7.1	6.1	4.8	6.4	6.1	9.4	10.0	98.5
Vlădeasa 1400	9.4	9.8	11.2	11.3	9.0	8.3	5.1	5.5	8.3	7.5	10.5	11.7	107.5
Vlădeasa 1800	13.5	14.0	15.7	15.2	13.4	12.1	11.2	9.3	11.2	11.1	14.8	15.3	156.8

Source: Data provided by the National Agency of Meteorology archive.

The average annual number of overcast days (an overcast day is considered so when the sum of the four cloudiness values registered daily is of 32 tenths or more) is much higher than those of sunny days.

The lowest annual number of overcast days is registered at Băişoara weather station, a total of 98.5 days, due to the positioning on the eastern slope, where descending air-mass movements originated on the western side are frequent. The highest annual number of cloudy days is registered at Vlădeasa 1800, a total of 156.8 days, due to the fact that this station is located in the direction of western air masses and to the high altitude which favors the frequent development of thermo-convective processes throughout the year (table 4, fig. 6).

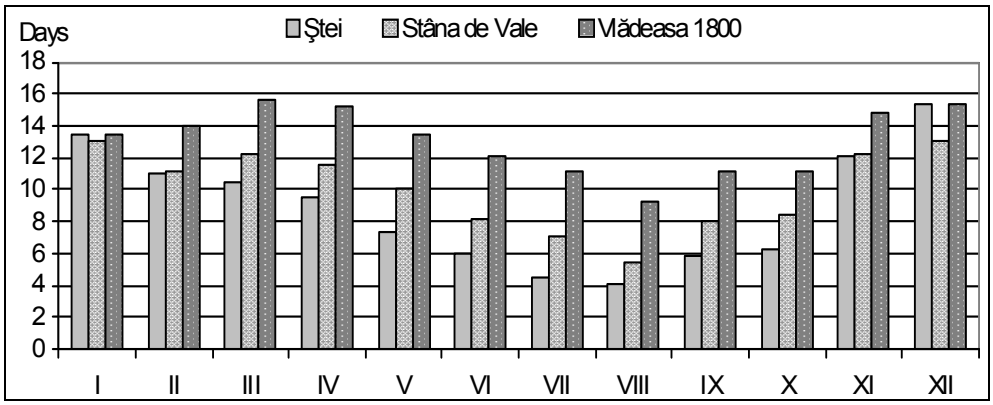


Fig. 5. Monthly average number of days with cloudy sky in the Apuseni Mountains.

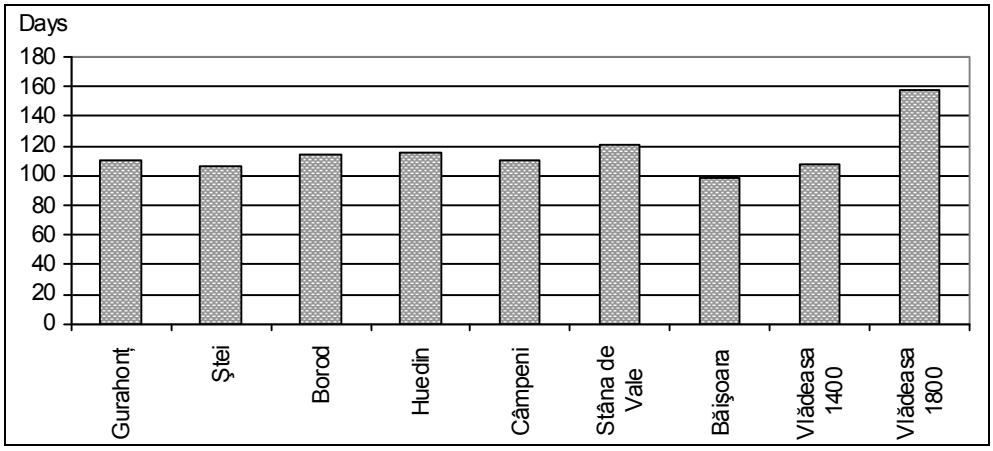


Fig. 6. Annual average number of overcast days in the Apuseni Mountains.

Throughout the year, the stations register the highest number of overcast days in the Apuseni Mountains in December (10-15 days), the maximum value being registered at Gurahonţ (16.2 days), while the minimum is recorded at Băişoara (10 days). The lowest number of registered overcast days is recorded in August (4-9 days), with a maximum value at Vlădeasa 1800 (9.3 days) and a minimum at Ştei (4.1 days) (table 4, fig. 5).

3. THE FREQUENCY OF DIFFERENT CLOUD TYPES

By calculating *the annual frequency* of different cloud types for the Apuseni Mountains, the results obtained are the following: the most frequent cloud type is the Altocumulus cloud, with a registered frequency varying from 13.8% at Vlădeasa 1800 up to 45.4% at Stâna de Vale, whereas the most rare cloud type observed is the Cirrocumulus cloud, with a registered frequency of under 1% (0% at Gurahonţ, 0.5% at Vlădeasa 1400) (fig. 7, table 5).

Generally, high clouds are less frequent, however, Cirrus clouds are registered at Vlădeasa 1800 with a 30.7% frequency.

Middle clouds are frequent enough, be they of the Altocumulus cloud type, followed by Altostratus clouds which are as frequent as 5% at Vlădeasa 1800 up to 23.6% at Stâna de Vale.

The most common low clouds found in this area are of the Stratocumulus type, as frequent as 4.0% at Vlădeasa 1800 up to 22% at Stâna de Vale. The Stratus cloud type is the less frequent low cloud type found in this area, as frequent as 0.5% at Vlădeasa up to 6.3% at Câmpeni.

Of the types of clouds with vertical growth, the most frequent are the Cumulus clouds, with a frequency of over 10% for the entire area whish has been studied, the highest value being registered at Vlădeasa 1800: 25.3% (fig.7, table 5). This figure and table also highlight the fact that the frequency of such clouds (vertical growth) increases with altitude, especially in the case of Cumulonimbus clouds, which are as frequent as 5.5% at Gurahonţ, 18% in the case of Stâna de Vale, and 14.7% at Vlădeasa 1800.

The annual frequency of cloud types (%)

Table 5

Station	Ci	Cc	Cs	Ac	As	Ns	Sc	St	Cu	Cb
Gurahonţ	11.8	0.0	4.0	21.4	10.7	9.3	16.6	6.1	14.4	5.5
Ştei	10.6	0.1	3.2	27.5	15.7	8.3	14.4	2.2	11.5	6.6
Borod	8.7	0.2	5.1	27.3	20.9	8.0	10.5	1.1	12.6	5.5
Huedin	11.1	0.3	5.5	24.5	9.1	7.8	13.3	2.2	13.0	13.2
Câmpeni	7.1	0.4	1.2	20.0	9.9	6.2	18.9	6.3	14.2	15.9
Stâna de Vale	15.0	0.3	5.8	45.4	23.6	13.7	22.0	1.6	16.7	18.0
Băişoara	11.5	0.4	4.7	22.3	11.6	4.2	13.8	2.3	14.4	14.7
Vlădeasa 1400	9.8	0.5	6.0	26.1	9.1	2.8	11.9	0.5	15.5	17.8
Vlădeasa 1800	30.7	0.1	4.4	13.8	5.0	0.1	4.0	1.8	25.3	14.7

Source: Data provided by the National Agency of Meteorology archive.

By calculating *the monthly frequency* of different types of clouds, one has established that during summer months, clouds with vertical growth are more predominant for all weather stations. Thus, in July, Cumulus clouds registered a 19.9% frequency at Ştei, 35.2% in the case of Stâna de Vale and 26.3% at Vlădeasa 1800, while Cumulonimbus clouds registered a frequency of 15.1% at Ştei, 38.2% in the case of Stâna de Vale and 18.5% at Vlădeasa 1800 (fig. 8, table 6).

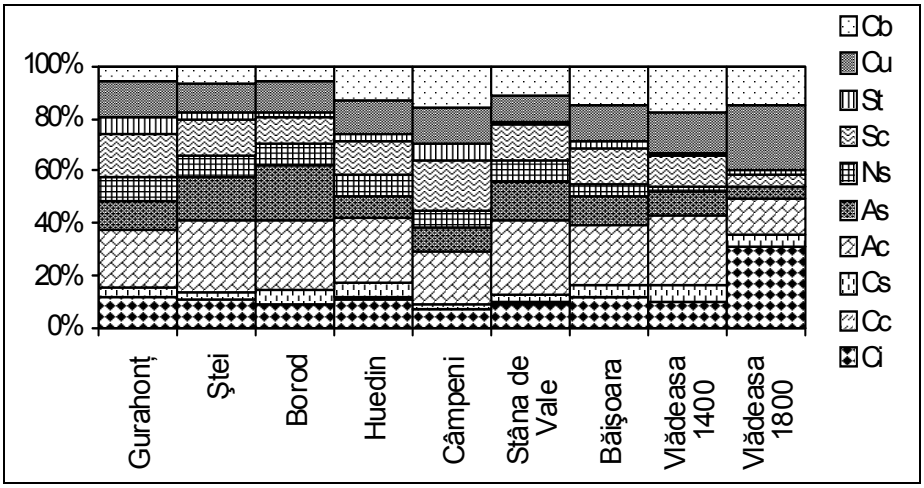


Fig. 7. The annual frequency of different cloud types in the Apuseni Mountains.

Stratocumulus clouds are the most representative example of the low cloud types, with a uniform distribution throughout the year, the highest values being registered at medium altitudes, that is at Stâna de Vale with a frequency varying from 18.5% in June and 28% in October. At the foot of the Apuseni Mountains (Ştei), Stratocumulus clouds are as frequent as 11.5% in August and 17.3% in November, while on the highest peaks (Vlădeasa 1800), their frequency decreases to 3.6% in January and 8.8% in April (fig. 8, table 6).

Stratus clouds are less frequent in all altitudes, however, they are more likely to appear during winter and more rare during the summer. Thus, their frequency ranges between 0.3% in April and 6.5% in January at Ştei, between 0.4% in June and 2.9% in December at Stâna de Vale and between 0.5% in June and 2.1% in December at Vlădeasa 1800 (fig. 8, table 6).

Middle clouds are the most frequent cloud type of the Apuseni Mountains, being uniformly distributed throughout all the months of the year and at all altitudes. Thus, the Altocumulus cloud type is as frequent as 24.7% in June and 31.6% in October at Ştei weather station, 41.3% in January and 52.0% in October in the case of Stâna de Vale and 19.8% in June and 32.2% in January at Vlădeasa 1800 (fig. 8, table 6).

High clouds also hold a uniform distribution throughout the year. The most frequent are Cirrus clouds which are present at the foot of the mountains (Ştei) as frequently as 6.1% in December and 13.3% in August. The higher the altitude, the more common they are, their frequency increasing from 10.1% in December and 18.6% in August for medium altitudes (Stâna de Vale), to 14.1% in July and 26.1% in January at Vlădeasa 1800. The most uncommon cloud type for Apuseni Mountains area are the Cirrocumulus, with a monthly frequence of 0.5-0.6%, with the exception of December at Vlădeasa 1800 where it increases to 1.2% (fig. 8, table 6).

Monthly frequency of different cloud types (%)

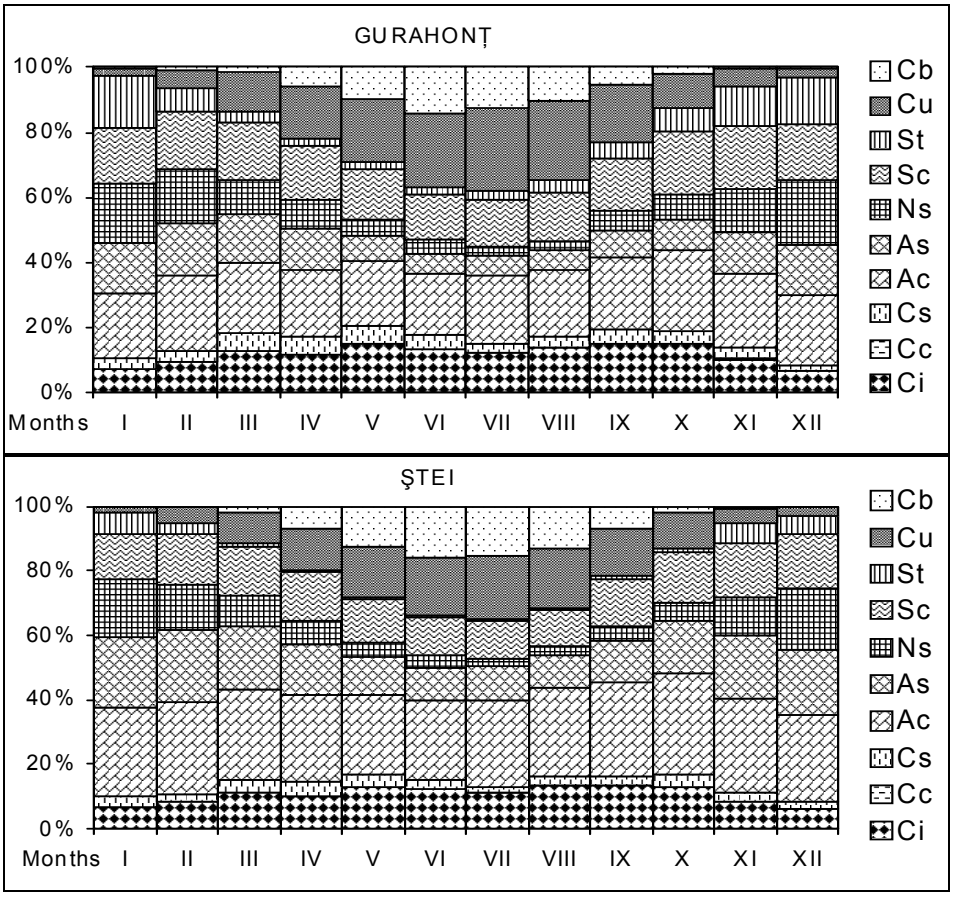
Table 6

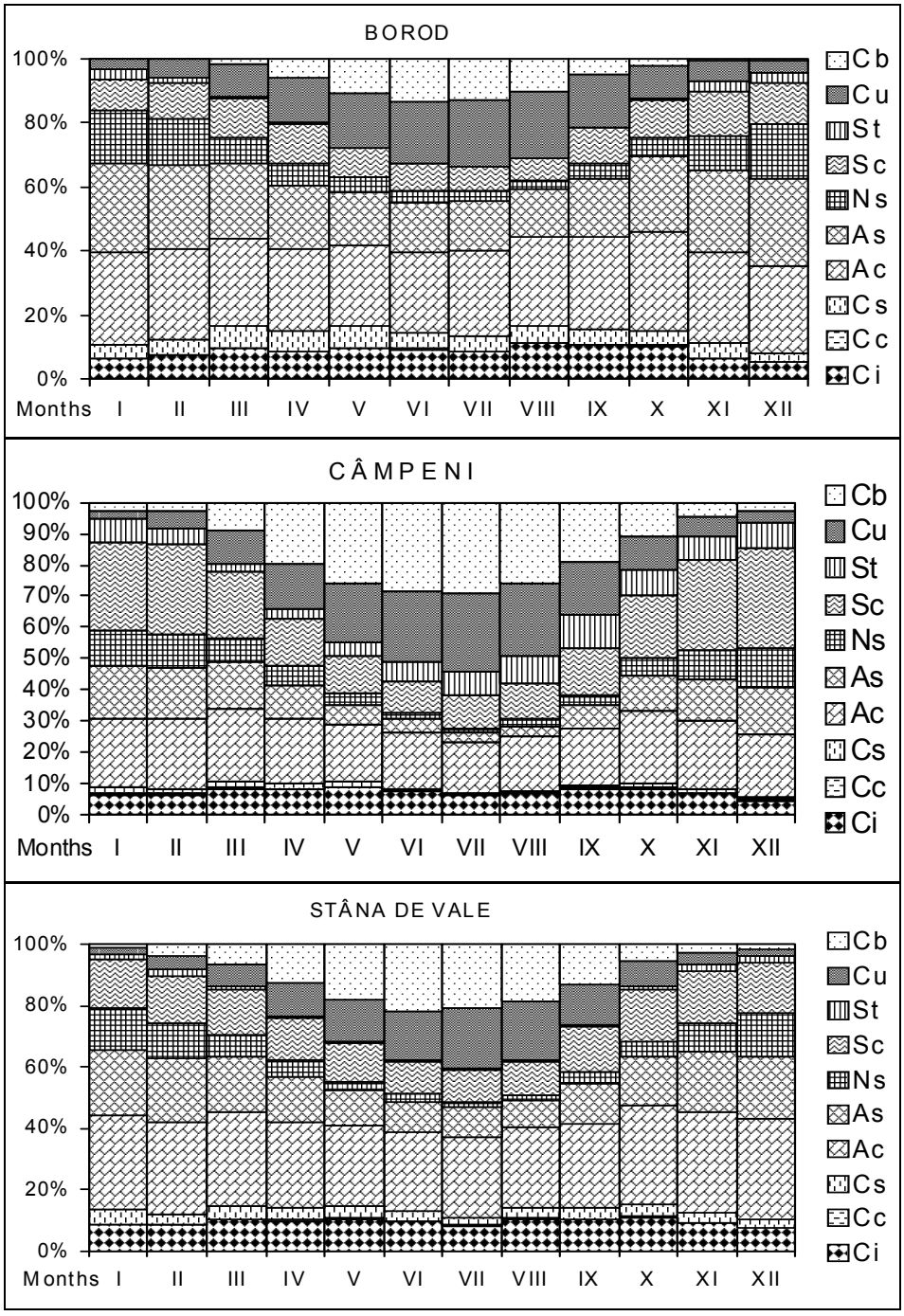
GURAHONȚ												
Types	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**IX**	**X**	**XI**	**XII**
Ci	7.3	9.1	12.5	11.7	15.1	13.3	11.9	13.7	14.7	15.0	10.0	6.3
Cc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0
Cs	3.2	3.8	5.5	5.6	5.2	4.0	3.1	3.5	4.3	3.8	3.4	2.1
Ac	19.7	23.1	22.0	20.5	20.0	19.4	21.1	20.5	22.6	25.0	22.8	21.6
As	15.4	16.1	15.0	12.6	7.9	6.1	5.9	5.7	8.0	9.4	13.0	15.3
Ns	18.6	16.6	10.3	8.6	5.0	4.2	3.0	2.9	6.1	7.6	13.2	20.3
Sc	16.9	17.6	17.9	17.1	15.6	13.6	14.4	15.2	16.2	19.5	19.6	16.8
St	16.3	7.5	3.1	1.8	1.9	2.2	2.5	3.6	5.0	7.0	12.0	14.8
Cu	2.3	5.5	12.2	16.5	19.8	23.1	25.8	24.6	17.8	11.0	5.3	2.7
Cb	0.1	0.7	1.6	5.6	9.6	14.0	12.2	10.4	5.2	1.7	0.5	0.1
ȘTEI												
Types	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**IX**	**X**	**XI**	**XII**
Ci	6.5	8.1	11.0	10.2	12.8	12.3	10.9	13.3	13.2	12.7	8.5	6.1
Cc	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.0	0.1	0.0	0.0
Cs	3.4	2.7	4.1	4.4	3.8	2.9	1.8	2.6	3.0	3.7	2.8	2.3
Ac	27.5	28.5	28.2	26.9	24.8	24.7	27.1	27.6	28.8	31.6	29.2	26.7
As	22.0	22.1	19.4	15.4	11.9	10.0	10.5	10.2	13.3	16.1	19.4	20.5
Ns	17.9	14.4	9.5	7.6	4.1	3.8	2.2	2.5	4.1	3.6	11.6	18.7
Sc	14.0	15.5	15.0	15.3	13.7	11.6	11.8	11.5	14.7	16.0	17.3	16.9
St	6.5	3.4	1.2	0.3	0.6	0.6	0.7	0.6	1.0	1.3	5.7	5.5
Cu	2.1	4.9	9.7	13.0	15.5	18.3	19.9	18.4	14.7	10.9	4.9	2.9
Cb	0.1	0.4	1.9	6.9	12.7	15.7	15.1	13.1	7.0	2.0	0.6	0.3
BOROD												
Types	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**IX**	**X**	**XI**	**XII**
Ci	6.4	7.4	9.6	8.6	9.7	9.3	8.7	11.2	10.7	10.4	6.7	5.6
Cc	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.2	0.1	0.0
Cs	4.3	4.7	7.0	6.4	6.7	5.3	4.6	5.5	4.4	4.7	4.3	2.7
Ac	28.8	28.3	27.2	25.4	25.4	24.6	26.9	27.7	29.0	30.9	28.4	27.2
As	27.6	26.5	23.3	20.2	16.5	15.6	15.5	14.5	18.1	23.1	25.7	26.9
Ns	16.8	14.4	8.4	6.6	4.5	3.6	3.0	2.8	5.0	5.8	10.8	17.5
Sc	9.4	11.2	12.2	12.5	8.9	8.5	7.3	6.9	11.1	11.9	13.8	12.7
St	3.2	1.5	0.5	0.2	0.2	0.2	0.1	0.3	0.2	0.5	3.3	3.2
Cu	3.2	5.7	10.0	14.3	17.3	19.4	20.8	20.6	16.4	10.2	6.1	3.6
Cb	0.2	0.4	1.7	5.8	10.6	13.3	13.0	10.3	5.0	2.3	0.8	0.6
HUEDIN												
Types	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**IX**	**X**	**XI**	**XII**
Ci	10.0	9.1	11.6	10.8	12.8	11.7	9.7	12.1	12.2	14.2	9.6	7.7
Cc	0.2	0.4	0.5	0.4	0.5	0.3	0.2	0.3	0.3	0.5	0.4	0.2
Cs	5.8	6.1	8.1	6.4	6.3	4.5	3.4	4.0	5.2	7.0	5.2	4.3
Ac	23.5	24.7	24.3	23.3	22.6	23.8	25.8	25.0	26.3	27.4	25.4	22.4
As	12.5	13.2	11.9	10.7	6.8	5.9	5.5	5.6	7.4	9.4	10.9	12.9
Ns	15.4	13.6	9.1	8.0	5.2	4.1	2.5	3.0	4.9	6.4	10.3	16.6
Sc	18.8	19.6	14.5	11.5	8.5	6.5	7.7	9.3	12.8	15.1	20.6	21.8
St	7.1	3.5	1.5	0.6	0.3	0.4	0.3	0.4	1.0	1.6	6.3	6.6
Cu	4.4	6.8	10.5	12.9	15.8	17.6	20.9	19.1	16.3	11.7	8.2	5.0
Cb	2.2	3.1	8.0	15.4	21.3	25.2	24.0	21.2	13.6	6.7	3.1	2.6

CÂMPENI												
Types	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**IX**	**X**	**XI**	**XII**
Ci	6.3	6.0	8.0	7.8	8.6	7.2	6.1	6.8	8.0	8.0	6.9	4.5
Cc	0.4	0.7	0.5	0.5	0.3	0.3	0.4	0.2	0.5	0.5	0.2	0.3
Cs	1.8	1.5	1.8	1.5	1.5	0.8	0.6	0.6	0.9	1.3	1.0	0.7
Ac	22.4	22.5	23.7	20.8	18.3	17.7	15.9	17.2	18.3	23.4	21.7	20.4
As	16.7	16.4	15.0	10.8	6.4	4.4	3.3	3.7	7.1	11.0	13.3	14.6
Ns	11.2	10.6	7.3	6.1	4.0	2.4	1.5	2.0	3.7	5.7	9.6	13.0
Sc	28.3	19.1	21.6	15.5	11.9	10.0	10.6	11.6	15.0	20.4	29.1	32.0
St	7.5	4.9	2.2	2.7	4.2	6.2	7.3	8.6	10.2	8.1	7.2	8.1
Cu	3.0	5.4	10.8	15.0	19.1	22.5	25.2	23.4	17.4	10.9	6.1	3.7
Cb	2.5	2.8	9.0	19.4	25.6	28.4	29.1	26.0	18.8	10.6	4.8	2.6
STÂNA DE VALE												
Types	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**IX**	**X**	**XI**	**XII**
Ci	11.8	11.8	15.1	15.7	17.5	16.5	14.7	18.6	16.7	17.6	13.0	10.1
Cc	0.0	0.4	0.2	0.2	0.3	0.3	0.6	0.5	0.4	0.6	0.0	0.0
Cs	6.3	4.9	7.1	6.3	6.4	5.2	4.6	5.9	6.1	6.9	5.3	4.4
Ac	41.3	41.5	46.0	45.0	43.5	44.4	48.1	47.0	44.8	52.0	47.1	44.7
As	28.8	29.2	27.6	23.5	19.0	17.4	17.8	15.5	22.0	26.0	29.4	27.8
Ns	28.1	24.0	16.4	11.7	5.5	4.5	4.0	4.9	7.0	10.2	20.2	30.2
Sc	21.3	21.4	22.8	21.5	20.6	18.5	19.2	20.3	24.5	28.0	24.6	22.2
St	2.5	2.7	1.4	0.8	1.0	0.4	1.0	0.8	1.2	1.8	3.3	2.9
Cu	3.1	6.2	11.3	17.5	22.7	28.2	35.2	33.6	21.1	13.1	5.1	3.0
Cb	1.3	5.6	9.5	20.2	29.8	37.1	38.2	33.5	21.9	9.0	4.2	2.4
BĂIŞOARA												
Types	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**IX**	**X**	**XI**	**XII**
Ci	11.8	10.2	11.6	10.6	12.4	11.8	9.1	11.2	11.8	15.2	12.4	9.9
Cc	0.2	0.2	0.4	0.3	0.2	0.3	0.4	0.4	0.8	0.7	0.4	0.3
Cs	5.9	5.2	6.1	5.3	4.7	2.9	2.4	2.7	5.4	6.4	5.4	5.2
Ac	23.1	22.5	21.5	21.9	21.3	21.1	22.7	21.6	21.8	23.7	24.6	23.0
As	17.8	18.2	15.7	12.6	8.0	5.8	6.3	6.2	8.2	11.6	15.8	17.7
Ns	7.7	7.5	5.4	4.1	2.4	1.7	1.0	1.2	2.1	3.2	7.1	9.3
Sc	19.9	20.7	16.4	12.6	8.4	7.0	8.1	9.2	12.5	15.8	19.2	20.9
St	4.5	3.8	2.7	1.4	0.9	0.8	0.8	0.9	1.9	3.6	3.4	4.7
Cu	5.7	7.9	11.5	14.4	18.1	20	22.4	21.2	19.6	13.1	8.0	5.3
Cb	3.4	3.7	8.7	16.7	23.6	28.6	26.8	25.2	15.7	6.7	3.6	3.6
VLĂDEASA 1400												
Types	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**IX**	**X**	**XI**	**XII**
Ci	11.0	10.7	10.7	9.6	10.1	8.6	7.4	8.2	8.0	11.4	11.8	11.5
Cc	0.1	0.1	0.4	0.2	0.5	0.7	0.7	0.7	0.9	1.1	0.1	0.1
Cs	7.1	6.8	7.7	7.2	5.9	4.3	3.0	4.1	5.7	6.5	7.4	7.8
Ac	29.6	30.6	25.7	24.8	21.6	22.1	23.7	23.9	25.9	30.1	30.9	29.3
As	14.3	14.0	11.0	10.2	5.7	5.1	4.9	5.5	6.9	9.9	13.8	13.9
Ns	5.1	6.1	5.1	2.4	1.4	1.1	0.5	0.8	1.3	1.8	3.7	7.1
Sc	19.1	16.3	13.0	10.1	8.1	7.9	7.2	8.6	12.8	13.6	15.3	17.4
St	2.1	1.4	0.6	0.1	0.3	0.1	0.1	0.1	0.1	0.2	0.2	1.1
Cu	6.3	8.0	12.2	15.2	18.8	23.0	26.0	22.5	18.1	14.0	7.7	4.9
Cb	5.1	6.0	13.7	20.2	27.7	27.0	26.6	25.6	20.3	11.5	9.1	6.8

VLĂDEASA 1800												
Types	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**IX**	**X**	**XI**	**XII**
Ci	26.1	23.4	22.3	17.4	16.4	16.7	14.1	16.4	20.1	24.9	23.3	24.9
Cc	0.2	0.4	0.3	0.4	0.3	0.3	0.5	0.6	0.6	0.5	0.2	1.2
Cs	13.8	11.0	11.9	8.9	7.5	5.0	4.4	5.1	7.3	10.0	11.3	12.5
Ac	32.2	31.2	25.8	24.3	22.1	19.8	21.5	21.7	24.4	28.5	30.4	30.9
As	16.7	17.5	15.3	12.7	8.5	7.1	6.8	7.4	10.3	11.5	17.4	16.9
Ns	1.9	2.3	2.4	2.0	1.6	0.9	0.7	0.9	0.9	1.3	2.6	2.9
Sc	3.6	5.0	7.0	8.8	7.2	6.1	6.5	6.9	7.1	6.4	6.7	5.2
St	1.8	1.7	1.4	1.0	0.7	0.5	0.7	0.8	0.9	1.7	1.8	2.1
Cu	3.7	6.7	10.8	16.2	21.4	24.2	26.3	23.1	19.3	12.3	5.7	3.4
Cb	0.1	0.7	2.7	8.3	14.1	19.4	18.5	17.1	9.1	3.0	0.7	0.0

Source: Data provided by the Archive of the National Agency of Meteorology.




BOROD
100%
80%
60%
40%
20%
0%
Months I II III IV V VI VII VIII IX X XI XII
Cb
Cu
St
Sc
Ns
As
Ac
Cs
Cc
Ci
CÂMPENI
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Months I II III IV V VI VII VIII IX X XI XII
Cb
Cu
St
Sc
Ns
As
Ac
Cs
Cc
Ci
STÂNA DE VALE
100%
80%
60%
40%
20%
0%
Months I II III IV V VI VII VIII IX X XI XII
Cb
Cu
St
Sc
Ns
As
Ac
Cs
Cc
Ci

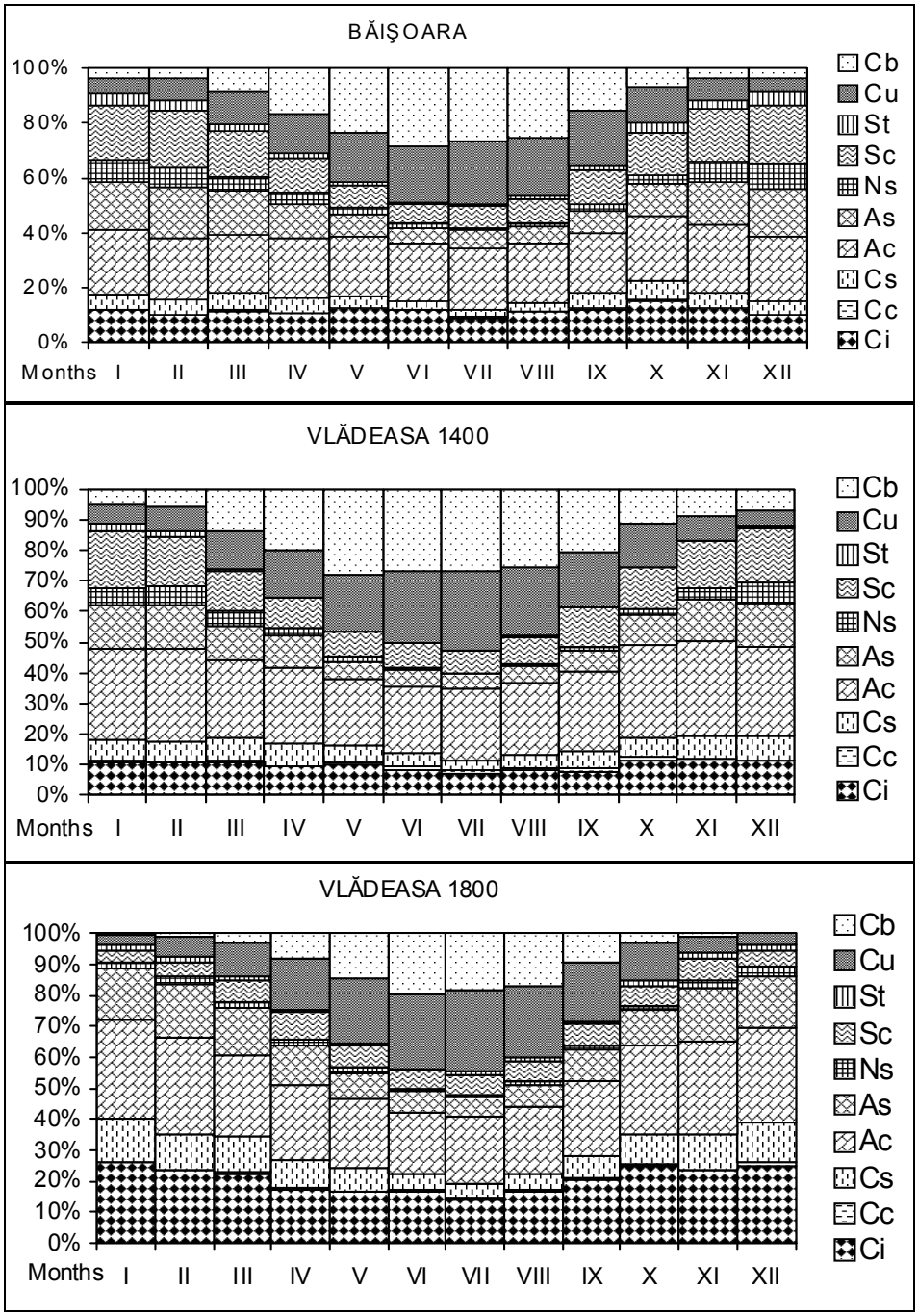


Fig. 8. Monthly frequency of different cloud types in the Apuseni Mountains.

3. CONCLUSIONS

Several conclusions can be set forth following the analysis of the regime and frequency of cloudiness in the Apuseni Mountains area :

a) Cloudiness is certainly accentuated on the western and north-western slopes, as they are exposed to the main direction of air-mass movement and to the atmospheric fronts, while reduced on the eastern and south-eastern slopes, due to descending air-mass movements which engender the dissolution of cloud systems. For example, the annual average coverage value registered at Stâna de Vale, on the western slope, is of 6 tenths, while at Băişoara, on the eastern slope, the value registered was of 5.8 tenths.

b) Throughout the year, the Altocumulus cloud type is the most frequent (14-45%), while Cirrocumulus clouds are rare (mostly 0.5%). Other types of clouds are differently represented and occur variably.

c) During summer, in July, Cumulus (20-35%) and Cumulonimbus clouds (15-33%) are the most frequently observed types. Altocumulus clouds are largely and evenly distributed both temporally and spatially, their frequency ranging from 25% in June by the foot of the mountain to 20% in June on the highest peaks and 50% for medium altitudes in October. Cirrocumulus clouds are the most seldom observed type, their monthly frequency not exceeding 0.5-0.6%, followed by the Stratus with a minimum frequency registered in June (0.3-0.4%) and a maximum in December-January (2-3% in the upper half and 6% in the lower half of the Apuseni Mountains).

d) The annual frequency of sunny as well as overcast days is distributed according to altitude. Therefore, the highest annual average of sunny days is registered by the foot of the mountain (61 days at Ştei), and the lowest on the peaks (37 days at Vlădeasa 1800), also registering the highest number of overcast days: 157. The lowest number of registered overcast days has been recorded at Băişoara (98), and is explained by descending air mass movements which contribute to the dissolution of cloud systems.

e) The monthly frequency of sunny days is higher in August (6-8 days) in low altitudes and in October (6-8 days) for high altitudes, due to the anticyclonic regime which manifests at the end of summer - beginning of autumn. The lowest frequency of sunny days is registered in December at the feet of the mountains (2-3 days due to the influence of oceanic air mass circulation sometimes thermal inversions, which support the formation of stratus clouds) and especially in May-June in the upper half of the studied area (1-2 days due to thermodynamic convection processes). The highest number of overcast days is also registered in the Apuseni Mountains' area in December (10-15 days), while the lowest such number has been registered in August (4-9 days).

R E F E R E N C E S

1. Apostol, L. (2004), *Clima Subcarpaţilor Moldovei,* Edit. Universităţii Suceava, Iaşi.
2. Bâzâc, Gh. (1983), Influenţa reliefului asupra principalelor caracteristici ale climei României, Edit. Acad. R.S.R., Bucureşti.
3. Cristea, Maria (2004), *Riscurile climatice din bazinul hidrografic al Crişurilor,* Edit. Abaddaba, Oradea.
4. Gaceu, O. (2005), *Clima şi riscurile climatice din Munţii Bihor şi Vlădeasa,* Edit. Univ. Oradea, Oradea.
5. Pop, P. Gr. (2006), *Carpaţii şi Subcarpaţii României. Ediţia a II-a revizuită şi adăugită*, Presa Universitară Clujeană.
6. Colectiv (1983), *Geografia României, I, Geografia fizică,* Edit. Acad. R.S.R., Bucureşti.
7. Colectiv (1987), *Geografia României, III, Carpaţii Româneşti şi Depresiunea Transilvaniei,* Edit. Acad. R.S.R., Bucureşti.
8. Data sources: Archive of the National Agency of Meteorology.

STUDIA UBB GEOGRAPHIA, LVI, 2, 2011

SOME ASPECTS REGARDING MINERAL WATERS IN BILBOR DEPRESSION

G. B. TOFAN[1], LAURA CĂLINA GIURGIU[2]

ABSTRACT. – Some Aspects Regarding Mineral Waters in Bilbor Depression. Bilbor – is a dam volcanic depression, located in the Oriental Carpathians, in their central group, between the Mesozoic crystalline area and the Neogene eruptive of Căliman Mountains, on the superior course of Bistricioara River. It is the most nordic settlement of Harghita County and as well the highest altitude settlement of the county, the precincts of the depression being comprised between 950 – 1050 m altitude, thus being included in the group of altitude settlements in our country. Bilbor is a depression region, located between three mountainous massives which surrounds it as walls do to a citadel. In the northern and eastern part, the Bilbor Depression is enclosed by the Bistriței Mountains, in the southern part by the Giurgeului Mountain and in the west by Căliman Mountains. Being located inside the moffette aureola in Căliman-Harghita, we can observe the existence of an important mineral water deposit, stored especially in the crystalline limestone from which most springs appear. Like other depressions, Bilbor Depression represents a connection nucleus between Transylvania and Moldova through mountains passes under the Pălținiș and Bursucăria peaks connects to Drăgoiasa – Glodu Depression and on the Bistricioara valley, through the Tulgheș pass the connection to Neamț county is ensured. The communication with the Borsec Depression is made through the Bistricioara valley as well and with the Giurgeului Depression through the Mestecăniș pass, then the Secu-Gura Secului narrow pass.

Keywords: *mineral waters, moffette aureola, „borvizuri" [i.e. regionalism for mineral water], mineral water bottling factory, „borviz swamps".*

1. INTRODUCTION

The territory of Harghita county, through its geologic variety facilitated the storing of a whole range of assortments of mineral waters (salted, sulphurous, carbonatated, ferruginous, mineral). On top of this hydrochemical variety, thanks to the direct influence of the post-volcanic moffette aureola in the new eruptive Căliman-Harghita, overlaps the mineral character. As a consequence of this fact the appearances of mineral waters are present on almost the entire county surface.

In the Harghita county there are six different types of mineral water deposits, which for the present case the most important are the mineral water deposits accumulated in the cracks and blanks of the crystalline formations, to which belong the appearances of bicarbonate mineral waters, the calcic, the magnesium mineral waters, sometimes the sulphurous ones from the basin of Bistricioara, summed up around the settlements of **Bilbor**, Borsec, Corbu, Tulgheș, from the second alignment of the northern half of the Mesozoic crystalline.

[1] *Babeș-Bolyai University, Faculty of Geography, 400006, Cluj-Napoca, Romania, e-mail: george.tofan@ubbcluj.ro*

[2] *Babeș-Bolyai University, Faculty of Geography, 400006, Cluj-Napoca, Romania, e-mail: laura.giurgiu@ubbcluj.ro*

2. MINERAL WATER HISTORIC RESEARCH IN BILBOR

The first research over the mineral waters ahve was made by the geologist I. Atanasiu, which studied the mineral waters from Borsec and the Bistricioara basin.

Knowing the large distribution of mineral waters appearance in the Harghita county, the Geology National Comitee has registered on its survey plan even since 1953, the execution of hydrogeologic prospections on the moffette aureola in Căliman – Harghita. The procedure was carried on after 1971 by the Ministry of Mines, Oil and Geology.

The research have started in 1953, with hydrogeologic prospections in the superior basin of Bistricioara at Bilbor, Borsec, Corbu and Tulgheş through hydrogeologic mapping made on a scale of 1: 20 000, designed by E. Davidescu and A. Pricăjan.

Between 1960-1961, Selényi Zsuzsanna Szabo and M. Székely performed a series of research studies over the mineral waters in Bilbor, establishing their main features.

In 1967 the aquiferous layers generating the mineral waters have been drilled, and the new series of hydrogeologic exploitations made in 1970 by a team of researchers from the Balneology Institute in Bucharest, have established the important mineral water deposit is located mostly in the crystalline limestone.

Also important information about Bilbor mineral waters can be learned from the numerous works of synthesis, such as *Natural therapeutic factors in Harghita County, Harghita County People's Council, Health Department* (1974), *Toplita – Small Tourist Guide*, R. Pufulete, M., C., Dumitrescu, (1987), and the synthesis work of A. Pricăjan, *Thermal mineral waters in Romania*, (1972), then together with Şt. Airinei, published a paper entitled *Mineral waters of food consumption in Romania*, (1979), where there are references to Bilbor mineral waters, as well as in his *Dialogue concerning mineral waters* of M., C., Dumitrescu, (1984).

The latest research on depression mineral waters, were conducted in German Frasenius laboratories for Şeştina mineral water source in 2008, in order to carry out mineral water bottling plant, revealing the important qualities of the water source, such as dioxide carbon naturally, high content of potassium, essential for body health and a balanced ratio of calcium and magnesium.

3. THE MAIN FEATURES OF MINERAL WATER IN BILBOR DEPRESSION

Bilbor mineral waters fall within the bicarbonate soda category **(borvizuri)**, located in the moffette aureola of Căliman – Harghita erruptive, where are the most interesting and rich deposits of this kind in our country. These waters due their mineralization to the latest manifestations of volcanism that gave rise to the massive eruption of the western Oriental Carpathians, forming broad moffette aureolas developed in the surrounding geological formations.

Of the six types of existing deposits in Harghita County, those from Bilbor are the type of mineral waters accumulated in the karstic levels of crystalline dolomite limestone.

Throughout the depression the mineral water springs are located to the west of it, i.e. on the right side of Bistricioara River and forms a relatively small area, where are about 15 mineral water dawns (according to other sources 17, Selényi Zsuzsanna Szabo and M. Székely, 1961), stored mostly in the hollows fir (ştiubee[3]) or concrete pipes.

[3] *A hollow trunk that serves as a rim of a small fountain.*

Most springs bear names that belong to local people with important contributions in hydro sources and affirming care.

Under Bâtca Bilboraşului, the most important mineral springs are: **Simion Lungu** and **Şeştina.** Simion Lungu mineral water spring is the only source hat stands ot even more pronounced by the continuity and intensity of the CO_2 issue, which is marked by the appearance of „*loud boiling*" water.

Under Piciorul Bilborului (Făget) is a line of springs represented mainly by the sources **Iacobeț**, **Raita**, **Truța**, and on the north side the three springs from **Vâlcăneşti.**

Fig. 1. The mineral water springs Simion Lungu and Vâlcăneşti, in 2010.

The remote Borcut mineral springs are located on the river of the same name, which is considered by locals as the „best" due to its outstanding properties, respectively on the Bistricioara Valley, in the area called **Huruba**, on a 300 – 400 m^2 area, there are six breaks of carbonated mineral water, which also belong to the main group, mineralization both by nature and by origin.

The mineral waters from Bilbor are hydrogeno – carbonate, calcium, sodium, magnesium-carbonated, being characterized by a high CO_2 content, free from 1.3 to 2.1 g/l and a total mineralization of 3-7 g/l. Characteristic of mineral water here is their high content of fluorine, which exceeds the other mineral in the region and country (3.98 mg/l).

Fig 2. The mineral water spring Borcut.

This explains the high content of fluorine that the presence of dental caries is low in those who consume it regularly. Although the fluorine concentration is incre-ased, the frequency of *tireopath endemic dystrophy*[4] is very low.

According to some researchers, the high magnesium content can also prevent cancer.

Springs hidrogeno-bicarbonate (HCO_3^-), calcium (Ca^{2+}), magnesium (Mg^{2+}), soda (CO_2), from Bilbor (according to R. Pufulete, and M. Dumitrescu, in 1987)

Table 1

The source of mineral water	Content in mg /l				
	HCO_3^-	Ca^{2+}	Mg^{2+}	CO_2	Total mineralization
Iacobeţ	2772.2	466.5	151.3	1752.5	5602.1
Vâlcăneşti	1911.7	468.5	55.0	1558.2	4197.1
Raita	2956.0	148.5	535.0	1884.0	5978.2
Şeştina	1827.1	299.3	103.1	177.3	4356.2

Springs hidrogeno-bicarbonate (HCO_3^-), sodium(Na^+), calcium (Ca^{2+}), magnesium (Mg^{2+}), soda (CO_2) in Bilbor, according to Pufulete R., and Dumitrescu M.,C., in 1987

Table 2

The source of mineral water	Content in mg /l					
	HCO_3^-	Na^+	Ca^{2+}	Mg^{2+}	CO_2	Total mineralization
Truţa	2510.1	190.5	445.9	135.6	2239.4	5717.3
Borcut	2099.2	57.0	410.2	121.2	1603.0	3788.4
Huruba	3432.6	187.3	621.0	213.3	1601.0	4631.0

Some mineral waters contain hydrogen sulphide (Vâlcăneşti), while others are weak ferruginous (Borcut). In addition to fluorine, they are present, although in smaller quantities, lithium ions, manganese, copper, zinc, bromine, iodine, boric acid, radium and radon. Most mineral waters containing radium. In Bilbor were higher than others in the region.

After some earlier measurements, the flow of mineral water sources are the following: Raita: 4360 l/24 h*;* Borcut: 5765 l/24h*;* **Şeştina**: **12960/24h**.

Regarding the number of counsmers, it amounts to about 3000, and is distributed as follows: the source Vâlcăneşti: about 2300 consumers, Raita: about 250, Şeştina: about 150, Iacobeţ: about 100, Simion Lungu: about 50, Borcut about 150.

The mineral water is indicated in disorders of the digestive tract and glands to treat gastric hyperacidity and chronic kidney and urinary tract of the device. Some waters contain mineral water springs indicated in neurosis and physical and intellectual exhaustion, as an example taking the Vâlcăneşti source.

[4] *Endemic goiter - Dystrophic thyroid disease occurring in 5-10% of the population in a territory where there is iodine geoclimateric deficiency. Because of the small amount of iodine it receives through food, the thyroid gland cannot produce enough thyroid hormone, which causes signs and symptoms of hypothyroidism.*

Following my analysis it is conlcuded that in terms of natural radioactivity in the commune Bilbor, mineral water can be used as drinking water daily mass consumption.

In popular parlance the mineral water springs are known as *borcut*[5] and *borviz*[6].

Near the mineral water source Vâlcăneşti there are two basins called by the locals „**Băile Dobreanu**", with waters rich in carbon dioxide, calcium, magnesium, hydrogen sulfide, indicated for the treatment of rheumatic pain in external cure. Currently used only by elderly residents, except during the summer. Also here is the „**Borviz swamp Dobreanu",** (eutrophe swamp), declared a natural reservation, situated at an altitude of 910 m, with a thick peat layer of 2.3 m, powered by carbonated springs, the area that meet a series of glacial relicts: dwarf willow *(Salyx repens),* birch *(Betula nana),* Siberian tongue *(Lingularia sibilica),* clover otter *(Manyanthes trifoliata).*

Fig. 3. The mineral water bottling factory in Bilbor Depression in 2010.

Encouraging is the fact that in 2008 was started the construction of a mineral water bottling, with a modern technology, by a newly established company which is part of the *United Romanian Breweries Bereprod*, one of the leading manufacturers and importers of beer and soft drinks in Romania, which has chosen to enter the area Bilbor anea market segment, namely that of mineral water. The total investment exceeds 10 milion euros, by exploitation of the Şeştina source, whuch has the highest rate flow from the existing sources in the commune (12960 l/ 24h), mineral water is extracted by drilling to a depth of 100 m. Here currently work 35 employees. There are two types of bottled water: natural mineral water, from one of the sources from Obcinele Căliman, located at an altitude of 1114 m, in two variants present in 0.5 l PET and 2 l PET, and that natural mineral water carbonated in 0.5 l PET and 1.5 l PET.

The factory has only one bottling line, with a capacity of 14 000 bottles/h for the 0.5 l container, 12 000 bottles/h for 1.5 l and 8000 bottles/h for 2 l.

The trump of the two sources of water exploitation is among the few sources that are discovered in Romania at a height so great that one reason for defining slogans Bilbor mineral waters is „*Purity from the altitude*", with a composition rich in minerals, which majes it ideal for consumption.

[5] *Borcut- Hungarian language, Wine fountain, mineral water.*
[6] *Borviz- Hungarian language, wine water, mineral water.*

In order to become an internationally renowned brand like Borsec, the manufacturer intends to export mineral water Bilbor at the end of 2010 in the Middle East, which would propel it to the international market of mineral waters.

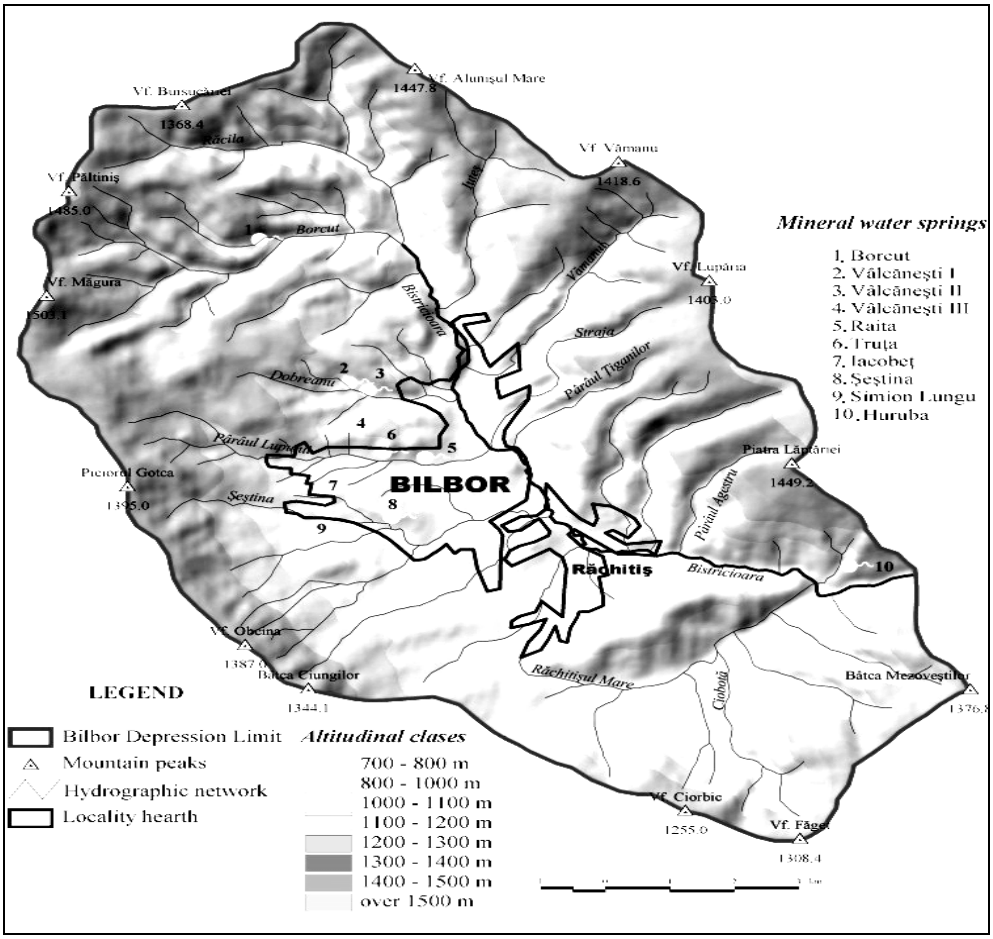


Fig. 4. Location of mineral springs in the Bilbor Depression.

In the future it is possible that in addition to the production of mineral water the company will produce soft drinks based on the berries existing here, and even launch a range of cosmetic products based on mineral water Bilbor.

4. CONCLUSIONS

Being an isolated commune, its development from the tourist point of view always stoodn under the sign of backwardness and not until today it starts going slightly over this setback.The lack of a connection road between Toplița and Vatra Dornei, through Bilbor, leads somehow to the isolation of it, not being a transit town but a head line.

The Bilbor economic potential disposes along with significant forestry resources, pasture, hay, coal, and an endless series of mineral resources, with a rich and diverse mineralization. Thus local mineral waters, is a card of this area, which is why we believe that this constitutes the essential prerequisite of tourism development which will lead to a particular type of accomodation and travel to a specific type, namely spa tourism.

In 1955, the Bilbor settlement was declared **„spa of local interest",** but due to reduced accomodation capacity, lack of equipments and spa facilities, a medical office, determined Bilbor to become a health resort with no treatment facilities.

The village currently has a limited number of furnished accomodation base for tourism, the accomodation being provided mostly by the inhabitants of the commune, the main categories of accomodation being: huts, hostels, rural farms, houses and hunting forest lodges.

With the launch of mineral water Bilbor on the market, this town receives an intense media coverage that will propel future spas in the category of those with national and even international interest, here it is possible to achieve a treatment center and spa complex, which besides ensuring proper treatment it will give us an opportunity for relaxation and leisure time throughout the year.

Therefore, we think it would be useful for the competent authorities to give greater importance to the future therapeutic use of mineral waters from Bilbor, given that they, in term of composition are not left with anything from the Borsec mineral waters.

R E F E R E N C E S

1. Atanasiu, I. (1939), *Distribuția regională şi geneza apelor minerale din România,* Revista „Iaşul Medical", an IV, nr. 1 – 9, Iaşi.
2. Ciangă, N. (1997), *Turismul din Carpații Orientali. Studiu de Geografie Umană*, Edit. Presa Universitară Clujeană, Cluj –Napoca.
3. Pop, E., (1965), *Studii şi cercetări de biologie; Problema relictelor glaciare în mlaştinile de tubă din România*, Edit. Academiei Române, Bucureşti.
4. Pop, P. Gr. (2006), *Carpații şi Subcarpații României*, Edit. Presa Universitară Clujeană, Cluj – Napoca.
5. Pricăjan, A. (1972), *Apele minerale şi termale din România*, Edit. Tehnică, Bucureşti.
6. Pricăjan, A., Ştefan, A. (1981), *Bogăția hidrominerală balneară din România*, Edit. Ştiințifică şi Enciclopedică, Bucureşti.
7. Pufulete, R., Dumitrescu M., C., (1987), *Toplița –Mic îndreptar turistic*, Edit. Sport – Turism, Bucureşti.
8. Tofan, Ana- Maria, (2009), *Valorificarea potențialului turistic din Depresiunea Bilbor şi împrejurimi*, lucrare de licență, Facultatea de Geografie, Cluj- Napoca.
9. Tofan, G., B., (2005), *Depresiunea Bilbor –Studiu geografic*, lucrare de licență, Facultatea de Geografie, Cluj –Napoca.

10. *** (1974), *Factorii terapeutici naturali din Judeţul Harghita*, Consiliul Popular al Judeţului Harghita, Direcţia Sanitară, Miercurea – Ciuc.
11. *** (1987), *Geografia României, vol.III, Carpaţii Româneşti şi Depresiunea Transilvaniei*, Edit. Academiei Republicii Socialiste România, Bucureşti.
12. *** (2007), *Dicţionarul explicativ ilustrat al limbii române*, Edit. ARC & GUNIVAS Publishing, Italia.

Note: "**Investing in people!**" PhD scholarship, by the Sectoral Operational Program for Human Resources Development 2007–2013,
Contract nr: POSDRU/88/1.5/S/60185: "Innovative Doctoral Studies in a knowledge based society". „Babeş-Bolyai" University, Cluj-Napoca, Romania.

STUDIA UBB GEOGRAPHIA, LVI, 2, 2011

WINDTHROWS AND SNOW BREAKS IN THE FORESTS OF THE MORPHOHYDROGRAPHIC GURGHIU BASIN

MARIA-LUMINIȚA NEAGU[1], I. A. IRIMUŞ[1]

ABSTRACT. – Windthrows and Snow Breaks in the Forests of the Morphohydrographic Gurghiu Basin. Our study is based on an analysis of the windthrows and the snow breaks which have affected the spruce and fir forests (*Picea abies and Abies Alba*) and which represent yet an important risk in Gurghiu basin, considering the climatic conditions (the abundance of solid precipitations and the wind intensity) and the cycles of appearance of this phenomenon. Windthrows and snow breaks affect mostly the pure spruce forests; the mixed forests - spruce and beeches - are not so affected because of their driving roots. The most devastating windthrows affecting the forests of the Gurghiu Basin had happened in 1915, 1967, 1975, 1987, 2004, 2007 and 2010. The damages have been considerable: several hundred thousand of cubic meters of wood for event. We must consider some aspects that reflect the gravity of this phenomenon: the environmental impact, the high cost of wood, the extra costs for planting new trees, the time required for the forest regeneration. Moreover, the risk reduction induced by the windthrows and the snow breaks should be performed by implementing several measures: planting trees in mixed brushes of spruce and beech, reducing the wood exploitation, the prevention of the phenomenon by using probabilistic methods for anticipation of its occurrence. The methodology includes a quantitative analysis of damages occurred during these events, an analysis of territorial dynamics of the phenomenon, a predictive approach by estimating the real risk and the measures which could be taken to reduce windthrows risk.

Keywords: *windthrows, snow breaks, spruce, fir, risk, probabilistic analysis.*

1. INTRODUCTION

The morphohydrographic Gurghiu basin is part of Mureş upper basin, the river Gurghiu being a left-side tributary of the Mureş River. The area of the Gurghiu basin is 563 km², out of which 40044 ha are covered by forests (the forest coverage being at 71%). The most frequent threats are the windthrows and the snow breaks, natural phenomena that affect mostly the spruce stands, but also the mixture of spruce and silver fir, sometimes even beech trees.

In the last decades, the growth rate of these phenomena in the forests of Central and Northern Europe has been noticed, last years even in the Western and East-Central Europe. All this is due to the context of global warming, to which the inappropriate forestry techniques are added. In Romania, the windthrows and the snow breaks affect especially the coniferous forests in the Eastern Carpathians.

[1] *Babeş-Bolyai University, Faculty of Geography, 400006, Cluj-Napoca, Romania, e-mail: irimus@geografie.ubbcluj.ro*

2. METHODOLOGY AND SCOPE

The purpose of this paper is to realize a diagnose of the windthrows and snow breaks situation in the forests of the Gurghiu basin, starting from the quantitative analysis of the data regarding the exploited wood volume from those phenomena, the analysis of the climate factors that influence their happening, finally trying to estimate the risks of windthrows and snow breaks by delimitation of those areas exposed to those abiotic damaging factors.

The methodology used is based on the quantitative analysis of the wood volumes resulted after the windthrows and snow breaks, the GIS techniques to point out the areas with the forests and delimitation of affected areas, as well as computational models of the windthrows indexes (the estimation of the windthrows risk).

3. CHARACTERISTICS OF FORESTS IN THE GURGHIU BASIN

The forests in the Gurghiu basin presents a natural setting according to altitude, from 375 m up to 1776 m, three stories can be highlighted: broadleaf, coniferous and broadleaf mixed and pure coniferous (fig.1).

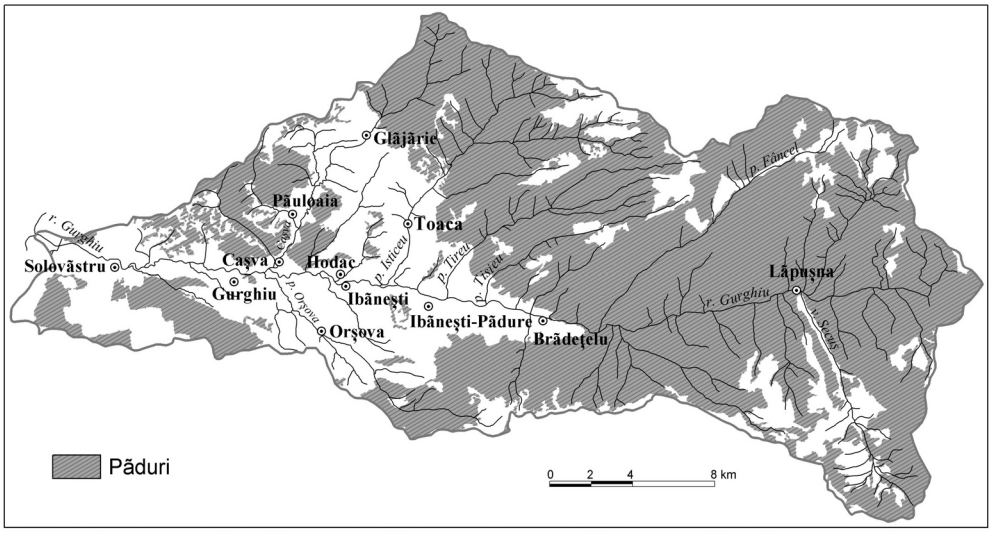


Fig. 1. Forest distribution in Gurghiu Basin.

The broadleaves (*Fagus silvatica*, *Quercus petraea*, *Quercus robur*, *Carpinus betulus*, *Alnus incana* and *Alnus gletinosa*, *Fraxinus excelsior*, *Acer pseudoplatanus*) are dominant up to 600 m. Between 600 m and 1000 m are the broadleaf mixed with coniferous, and the pure coniferous (*Picea Abies*, *Abies Alba*, *Larix decidua*) are found at altitudes over 1000 m. The dominant species is the spruce and it holds a 50% out of all species followed by the beech with 39%. In the Gurghiu Forest Range is found one of the

most important resonance spruce protected area from the country: Natural Protected Area "The Resonance Spruce from Lăpuşna" with an area of 78.8 ha, from which 1.5 ha is a seed growing reservation.

4. WINDTHROWS AND SNOW BREAKS

The windthrows can be defined as "*…any mechanical injury that affects a tree or a stand due to wind action"* (I. Popa, 2007, p. 17). Besides wind, the snow, due to its weight that acts on the canopy can cause broken branches or tops (in the case of silver fir and spruce). In our country, the wind and the snow are the major natural phenomena that the mountain forest ecosystems have to withstand.

In the last decades, at European level we can witness an increase of appearance rate of those natural phenomena, especially in Central and Northern Europe, but also in Western Europe. Main cause of this fact is represented, according to specialists, by the climate changes which are responsible for the violent storms (of hurricane type - Kyrill and Klaus in Central Europe) or the heavy snow falls. Only in the last twenty years we can identify, at European level, at least five major wind based catastrophes (Collin *et al*, 2006), most important being: France 1999 (when the windthrows wood volume was over 144 millions m^3), followed by the January 2005 Sweden's windthrows (with 75 millions m^3).

In Romania, the majority of windthrows and snow breaks affect the coniferous forests in the Eastern Carpathians. The most important happened in the years: 1947-1948, 1964, 1969, 1974-1975, 1995, 2002 (I. Popa, 2007), through out the most intense being 1947-1948 and 1974-1975, with the total windthrows wood volume of over 30 millions m^3. The spruce is the most vulnerable species at the windthrows mainly because of its sliced roots that offers no stability. Most affected are the pure spruce stands, the mixed spruce stands resist a little better in front of this disaster.

5. WINDTHROWS AND SNOW BREAKS IN THE GURGHIU BASIN

The windthrows and snow breaks are the natural phenomena that affect the most often the forests in the Gurghiu basin. The majorities of the windthrows have an endemic character and occur yearly. Catastrophic windthrows are scarce, the biggest being dated in the year 1975.

5. 1. Windthrows causes

The most important causes that these phenomena originates from are the climate conditions, the biometrical characteristics of the trees and the structure of the stands, to which often is added the topographic conditions and the forestry techniques.

5. 1. 1. Climatic conditions

On the Gurghiu basin level, the annual average temperature is around 6-8 ° C and the annual average precipitation is around 850-950 mm/year, with the maximum precipitation of 1244.2 mm/year (Fâncel). The snow fall is more intense in the winter months of December to February, at altitudes of over 1100 m the average thickness of snow cover reaching values between 70-100 cm (observation point Lăpuşna, 1200 m). Generally, the wind has an average speed between 2-4 m/s, speed, direction and intensity being influenced

by the local characteristics of the relief (mainly the presence in the Eastern part of the basin of the Gurghiu Mountains). Extreme winds appear during violent storms like those of August 2003, March 2004 and June 2010.

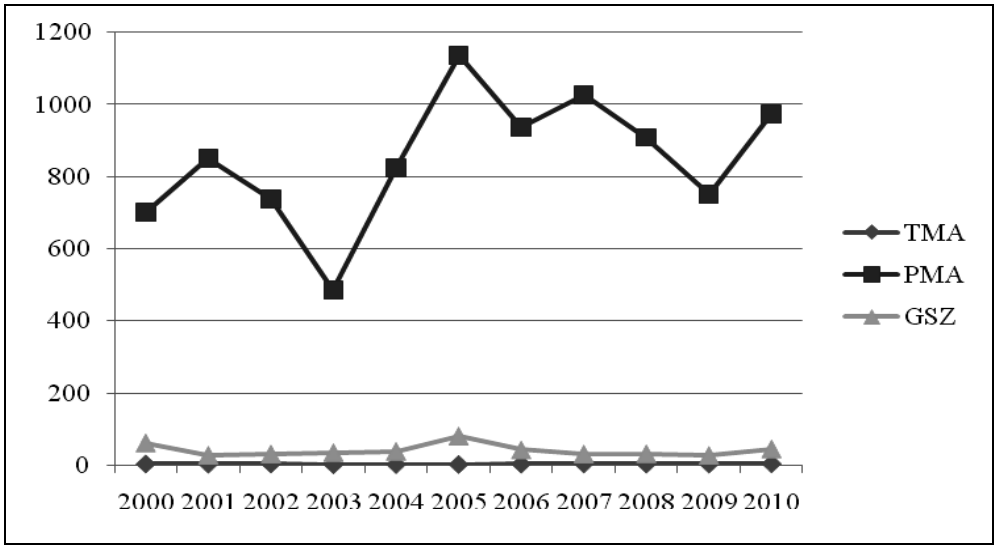


Fig. 2. Annual averages for temperature, precipitations and snow cover thickness for the last decade.

5. 1. 2. Biometrical characteristics and stand structure

The average wood volume per hectare is about 330 m³, and the average age of the trees is 69 years (according to the Dynamics of the Forest Development from Forest Range Gurghiu and Fâncel`s Planning). The spruce is the most vulnerable species at the windthrows mainly because of its sliced roots. Most affected are the pure spruce stands, the mixed spruce stands being a little more resistant. The shape of the canopy indicates a higher sensitivity to snow beaks (peak rupture). The height of the stands and the age indicates the risk factor to windthrows: the older and taller they are, the higher the risk. In the forests of the Gurghiu basin the spruce (which is found in massive form) has an average height of 30 m, with the maximum height of 45 m, the average age of the trees being 60 years. The silver fir, unlike the spruce, can't be found in pure massive form more likely to be found as a twin. The average height of the silver fir is 30-35 m. The silver firs average age is around 50-60 years.

5. 2. Windthrows and snow breaks from the last 40 years in the Gurghiu basin

The analysis of the exploited wood volume after the windthrows and snow breaks in the last 40 years indicates the fact that the frequency of those phenomena increased in the last decade, as a result of global climate changes. The most damaging windthrows happened in November 1975, when the pure spruce stand from the Sebeș plateau (over 300 ha), from UP IV Fâncel, from UP V Meștera, from Gâtii Valley, Bătrâna Valley and Secuieu Valley were affected. The total wood volume after those windthrows was over 500000 m³. In the winter

1986-1987, the young stands from UP VI were affected by the snow breaks (especially in the peak). In the next decade were fewer damages from the climatic phenomena, the most important being those from the winter of 1995, that affected the stands from UP VIII. In the last decade, there were four major episodes with windthrows and snow breaks: August 2003, March 2004, January 2007 and June 2010.

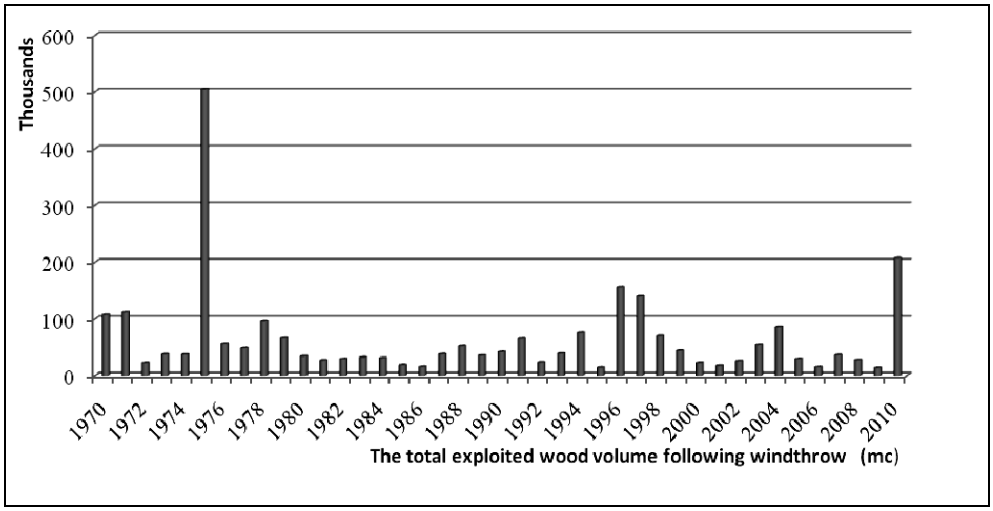


Fig. 3. Volumes exploited from windthrows and snow breaks in the last 40 years (m^3).

5. 3. Windthrows from the 14-15 June 2010

The most recent windthrows were in the 14-15 June 2010, after a violent storm, being affected both older spruce stands and younger beech stands (over 20 years), on a total surface of 5953 ha. The damaged volume was over 200000 m³. The damages to the trees were various: uprooting the roots, stem bending, broken branches and tops.

a b c

Fig. 4. a, b, c. Windthrows in June 2010 in Isticeu Valley.

Subsequently, there were measures that were enforced to clean the areas affected. This measure is a must to prevent the attack of the insect *Ips Typographus*, insect that attack specially the spruce bark from the forest edge as a result to windthrows.

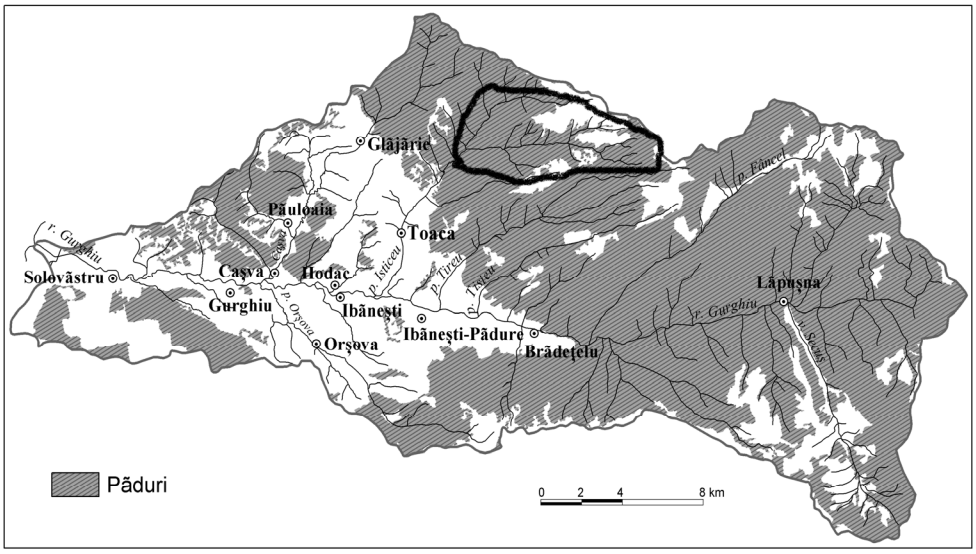


Fig. 5. The windthrows affected area in June 2010.

6. THE RISK OF WINDTHROWS IN THE GURGHIU BASIN

The windthrows risk is the probability of a natural disaster to occur, being influenced by a sum of both biotic and abiotic factors. According to ICAS Braşov, considering the exploited wood volume from the windthrows (inadvertently produced), the surface of the forest fund and the number of years for which the analysis was made, there can be a windthrows index calculated, using the formula:

$$\mathbf{Idv = vol / area / n^{o} years * 100000}$$

in which: Idv = Windthrows Index; Vol = Windthrows Volume; area = the area of the forest fund; n^{o} years = the number of years for which the analysis was made; 100000 = correction factor.

Applying the above formula for the whole area of the forest (40044 ha) and taking in consideration the windthrows and snow breaks exploited wood volume in the last 40 years, the windthrows index peaked 162.9. According to the classification made by ICAS Braşov (http://www.icasbv.ro/doboraturi-produse-de-vant.html), the value of the index indicates a very high risk to the windthrows.

The probability of windthrows and snow breaks events is influenced by various factors, the most important being: the dynamic of climate parameters (wind intensity, direction and speed, precipitations), the age of stands, biometrical characteristics (height, diameter, consistency, slenderness degree), the exposure of the stands (sheltered slopes, exposed slopes), the stands structure (pure or mixed), topography (slope). To all this, the human factor is another significant influence.

7. CONCLUSIONS

The windthrows and the snow breaks are the most important threat to the forests of the Gurghiu basin. The analysis of the windthrows and snow breaks exploited wood volumes in the last 40 years show an increase of the frequency of those phenomena occurrence in the last decade. The windthrows after a violent storm in June 2010 affected both the older spruce stands and the young beech stands. This is unusual in the area, being owed mostly to the climate changes in the last years.

The severity of those natural phenomena is more acute as their prevention is virtually impossible, other than applying adequate forestry techniques. The wind is a dynamic factor, its action is unpredictable. Nowadays, at a European level, the mathematical models and the GIS mapping techniques of the windthrows and snow breaks have gained more ground in an attempt to reduce the risk of windthrows and snow breaks.

R E F E R E N C E S

1. Balleux, P. (2006), *A propos de la stabilité des pessières*, in Forêt Wallonne n° 83-juillet-août.
2. Collin, J-F. et al. (2006), *La problématique chablis, s'y préparer et gérer la crise (1ere partie)*, in Forêt Wallonne, n° 80-janvier-février.
3. Doll, D. (2000), Statistiques historiques des grands chablis éoliens en Europe occidentale depuis le milieu du XIXe siècle: analyse critique, in Les Dossiers de l`Environnement de l`INRA (http://www.inra.fr/dpenv/pdf/DollD20.pdf).
4. Dorog, S. (2007), *Noţiuni teoretice şi practice în Amenajarea pădurilor*, Editura Univ. din Oradea.
5. Irimuş, I.A. (1998), *Relieful pe domuri şi cute diapire*, Edit. Presa Universitară Clujeană.
6. Irimuş, I.A. (2003), *Geografia fizică a României*, Casa Cărţii de Ştiinţă, Cluj-Napoca.
7. Irimuş, I.A. (2006), *Hazarde şi riscuri asociate proceselor geomorfologice în aria cutelor diapire din Depresiunea Transilvaniei*, Edit. Casa Cărţii de Ştiinţă, Cluj-Napoca.
8. Lateş, N., Chindea, T. (1971), *Contribuţii la Monografia judeţului Mureş "Gurghiul"*, Târgu-Mureş.
9. Mac, I., Şoneriu, I. (1973), *Judeţele Patriei*, *Judeţul Mureş*, Edit. Academiei, Bucureşti.
10. Mac, I. (1972), *Subcarpaţii transilvăneni dintre Mureş şi Olt. Studiu geomorfologic*, Edit. Academiei Române, Bucureşti.

11. Neagu, Maria-Luminița, Irimuș, I.A. (2010), *Human and natural resources in the tourism development of the Gurghiu morpho-hydrographical Basin*, in Studia UBB Geographia, LV, 2, Cluj-Napoca.
12. Negulescu, E. (1940), *Monografia Văii Gurghiului*, Arhiva Ocolului Silvic Gurghiu.
13. Panferov, O. et al. (2009), Feedbacks of windthrow for Norway spruce and Scots pine stands under changing climate, in Environmental Research Letters 4045019 (www.iopscience.iop.org).
14. Pop, P. Gr. (2001), *Depresiunea Transilvaniei*, Edit. Presa Universitară Clujeană, Cluj-Napoca.
15. Pop, P. Gr. (2006), *Carpații și Subcarpații României*, Presa Universitară Clujeană, Cluj-Napoca.
16. Popa, I. (2007), *Managementul riscului la doborâturi produse de vânt*, Editura Tehnică Silvică, București.
17. Quine, C. (1994), *An improved understanding of windthrow-moving from hazard towards risk*, in the Forestry Authority Research Division.
18. xxx *Amenajamentele Silvice ale Ocolului Silvic Gurghiu și ale Ocolului Silvic Fâncel, Institutul de Cercetări și Amenajări Silvice, 1948, 1980, 1990, 2001.*
19. xxx (1926), *Monografia Domeniului Gurghiu*, Revista Pădurilor, Anul XXXVIII, Iunie-Iulie 1926, No. 6-7, București.
20. xxx Cronica Ocolului Silvic Gurghiu și a Ocolului Silvic Fâncel.

Site-uri internet:

www.icasbv.ro

www.romsilva.ro

www.persee.fr

Note: Investing in people! PhD scholarship, Project co-financed by the European Social Fund, SECTORAL OPERATIONAL PROGRAMME HUMAN RESOURCES DEVELOPMENT 2007 – 2013, Babeș-Bolyai University, Cluj-Napoca, Romania

STUDIA UBB GEOGRAPHIA, LVI, 2, 2011

PROTECTED AREAS IN ROMANIA BETWEEN DESIDERATA AND REALITY. CASE STUDY: IZVORUL TĂUŞOARELOR CAVE

M. MUREŞIANU[1], C. THEODORESCU[1], E. SCHUSTER[1], I. BÎCA[1], A. BARTA[1]

ABSTRACT. – Protected Areas in Romania Between Desiderata and Reality. Case Study: Izvorul Tăuşoarelor Cave. Protected areas represent one of mankind's major problems worldwide, as they comprise the most representative selection of biodiversity, wild flora and fauna. If at global level the percentage of 8.83% of land surface covered with protected areas is acceptable, the problem that has to be resolved in time is that of the inequalities among categories of protected areas and that of contrasts at continental and national level regarding the much bigger number of protected areas without administrator or curator compared to those that are efficiently controlled and administered. Romania's territorial integration in the geographical space of the EU was followed by numerous measures through which legislation was adapted to meet European standards; therefore, along with social and economic demands, special and specific standards regarding protection of nature were imposed to our country. European directives and norms oblige Romania to increase its territory covered with efficiently administered protected areas up to the optimal value of 15% of its national territory, a percentage stipulated by the Natura 2000 network. Unfortunately, due to the shortage of financial resources destined for the management of protected areas, the majority of them remain "on paper" units. A particular case is the cave from Izvorul Tăuşoarelor in Rodna Mountains. This true morpho-geographical jewel, despite the fact that it benefited from the care of a professional speleologist for more than ten years, was placed under the custody of the Bistrița-Năsăud County Museum Complex only in February 2010, after several attempts to do so, because of some legal and bureaucratic limitations.

Keywords: *protected areas, sustainable development, biodiversity, European integration of regional protected areas, paper park syndrome, morpho-geographical "jewel", Izvorul Tăuşoarelor Cave.*

1. INTRODUCTION

By holding the most representative samples of biodiversity, protected areas are one of humanity's major problems worldwide. The 1948 founded International Union for Conservation of Nature (IUCN) considers that protected areas have a vital contribution in conserving the planet's natural and cultural resources. They also have the role of conserving relevant samples of natural regions and biological diversity, and to maintain the surrounding ecological stability of the surrounding regions.

According to IUCN statistics, nowadays there are approximately 30,400 protected areas worldwide, from which only about one third are efficiently managed and supported, while the rest of them are "victims" of either man's ignorance for environmental problems, or ineffective governmental national policies.

[1] *Babeş-Bolyai University Cluj-Napoca, Faculty of Geography, Bistrița Academic Extension, RO-420117 Bistrița, e-mail: mmuresianu@geografie.ubbcluj.ro*

At European level, Romania owns the most diversified and valuable national patrimony, due to its position at the intersection of five bio-geographical regions, a unique feature among the continent's countries.

In order to fulfil accession conditions and to respect obligations assumed through international treaties, conventions, and agreements, Romania had to determine its net of natural protected areas and to ensure an adequate management. But there exists a major contrast between the need for Romania to fully align to European environmental policies, in order to reach in a few years an amount of 15% of its territory covered with protected areas, and the financial capability to support their efficient management. Statistics revealed that at the end of the year 2009, from approximately 1,000 protected areas nationwide, only around 350 had a custody agreement. That is why specialists consider that the Protected Areas National Network is suffering from the so-called "paper park syndrome", meaning it mainly exists only on paper.

An interesting, particular case is the Izvorul Tăuşoarelor Cave, a spectacular protected area which is for over a decade under the care of a professional speleologist (considered as the cave's custodian), but whose numerous attempts to attach the cave, through an official custody agreement, to the Bistriţa-Năsăud County Museum, failed because of bureaucratic difficulties from governmental officials. Only in February 2010, this true jewel of nature gets the green light and is contractually set under the custody of the prestigious institution mentioned.

2. PROTECTED AREAS IN THE WORLD

In 1994, IUCN experts conceived and elaborated a widely accepted definition, according to which "A protected area is an area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means". Until almost two decades ago, protected areas were assumed and considered by specialists everywhere as a "conservative" matter, being treated as "insular" areas or veritable "oases" of wild nature in a "desert" of economic development, which have to be preserved only for the protection of inhabitant species. It is the Fourth World Congress on National Parks and Protected Areas, held in 1992 in Caracas, Venezuela, that substantially modified the traditional view regarding protected areas, seen restrictively, as areas isolated from the surrounding landscapes and local communities. It was admitted that economical and social development is based on the resources and services of natural capital (the network of natural ecosystems) and that sustainable development has to consider the productive and supportive capacities of natural capital, in order to prevent excessive exploitation and deterioration of natural resources.

In order to prevent or decrease threads to biodiversity, the idea was stated that protected areas, may be studied, evaluated and monitored so that models of cultivated ecosystems shall be determined, for the sustainable development of society.

IUCN ensures, in partnership with about 800 members (governmental and non-governmental agencies) from 125 countries, the cooperation in the field of biological diversity preservation and of sustainable usage of natural resources. IUCN consider that protected areas represent the "engine" for rural development and rational use of marginal land, for continuous research and monitoring, for education regarding preservation, and for recreation and tourism.

Distribution of protected areas on large geographical regions

Table 1

Geographical Region	Nr.	Total area (km^2)	Average area (km^2)
Antarctica	99	3,788	38
North America	6,711	4,083,806	609
Central America	384	86,049	224
South America	1,437	1,838,826	1,280
Pacific Area	152	13,113	86
The Caribbean	579	108,637	188
Europe	9,325	603,601	65
Northern Eurasia	648	657,935	1,015
Central-North Africa	542	1,037,576	1,914
Central-West Africa	343	755,836	2,204
South-East Africa	972	1,318,615	1,422
Southern Asia	719	212,924	296
South-East Asia	1,524	518,864	340
Eastern Asia	1,078	883,681	820
Australia – New Zeeland	5,882	1,109,024	189
Total	**30,395**	**13,232,275**	**435**

Source: IUCN-WCMC joint World Database on Protected Areas.

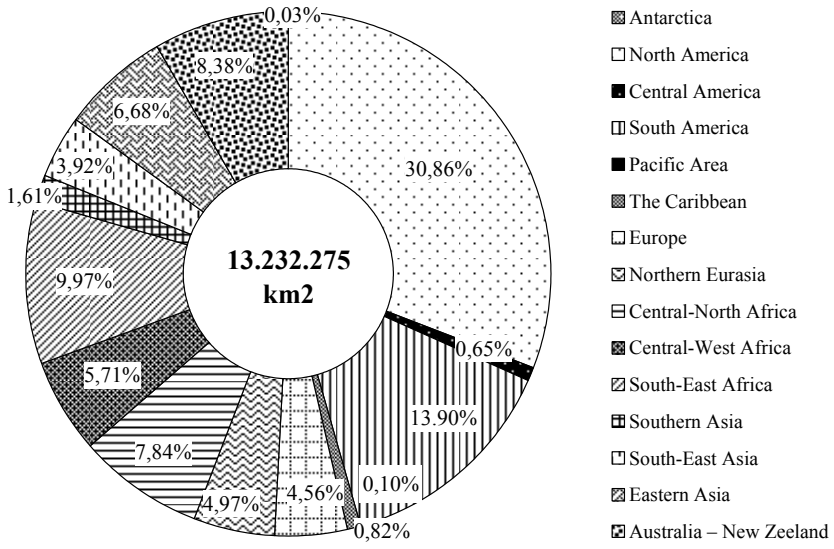


Fig. 1. Proportion of protected areas on large geographical regions.

IUCN's Commission on National Parks and Protected Areas (CNPPA, now the World Commission on Protected Areas, WCPA) compiled in 1981 a first list of protected areas, creating a database for protected areas worldwide (Protected Areas Data Unit), as part of the World Conservation Monitoring Centre (WCMC). According to these statistics, there are about 30,400 IUCN recognized protected areas, 13,915 not IUCN accredited protected areas, and 16.288 protected areas with unclear status.

Worldwide distribution of IUCN's main categories protected areas reveals a total of 13,232,275 km^2, meaning 8.83% of the World's surface, an acceptable percentage at global level, but uneven in terms of protected areas categories or territorial distribution at continental or national level (fig. 1).

Reviewing this repartition, we can extract following conclusions:

- category IV (Habitat/Species Management Area) has a high frequency (37% of all protected areas), followed by Category V – Protected Landscape/Seascape (18%), Category Ia – Strict Nature Reserve (14%), Category II – National Park (11%) and Category III – Natural Monument (7%);

- if we look at the percentage of these categories in the total area covered with protected areas, we notice that Category IV holds only 19%, Cat. V – 8% and Cat. I – 7%, while the categories with lower frequency (II and III) cover significant areas (30%, respectively 28%);

- the global network of protected areas covers a substantial area (8.83%), with a tendency to increase its surface, excepting North America, the Caribbean, Pacific Area and South-East Africa;

- protected areas with smaller extend prevail against vast ones, excepting those in Central-West Africa, North Africa, South-East Africa, South America and Northern Eurasia, endangering the preservation of biodiversity, of habitats/species and their integrity;

- the existence of some geographical regions, and implicitly states, with less than 10% designated as protected areas, and about 20% of the World's countries with under 1% of their national territory covered by protected areas;

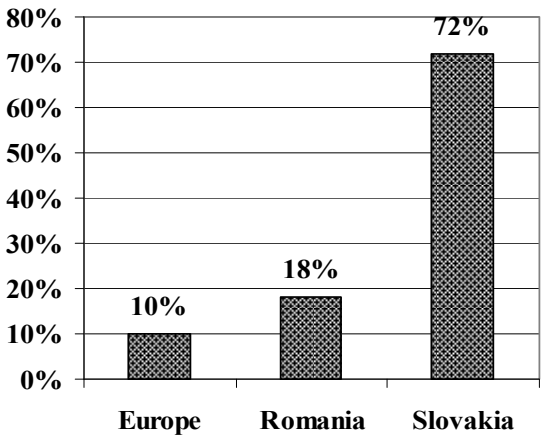


Fig. 2. European contrasts regarding the percentage of territory covered with protected areas.

- the number and extent of marine protected areas lie far beyond that of terrestrial ones, as the general interest for the letter is vastly higher;

- at European level, the total surface of category I – V protected areas represents 10,19% of the continent's total surface, thus outpacing the worldwide average by 1.36%. But in Europe, too, significant differences occur between various countries regarding their amount of national territory covered by protected areas, as their respective policies regarding the establishment of protected areas, as well as decision-making factors reveal certain varieties. Slovakia, for ex., ranks first, with 72.36% of its national territory occupied by protected areas, while Romania, with approx. 18%, is on place 26 (fig. 2).

3. PROTECTED AREAS IN ROMANIA

3. General assumptions

At European level, Romania possesses the most diversified and valuable natural patrimony, as it lies at the interference of five bio-geographical regions: alpine, continental, pannonian, steppic, and marine, and is therefore, from this perspective, unique on the continent. Consequently, the proportion of species in Romania's flora by major areas is: 29% European and Eurasian species, 21% continental and marine species, 18% South- and Southeast European species, 14% circumpolar and alpine species, 6% Mediterranean species, 3% Atlantic species, 4% endemic species, 3% cosmopolite species, and 2% adventive species (Al. Beldie, cited by N. Doniță, 1992).

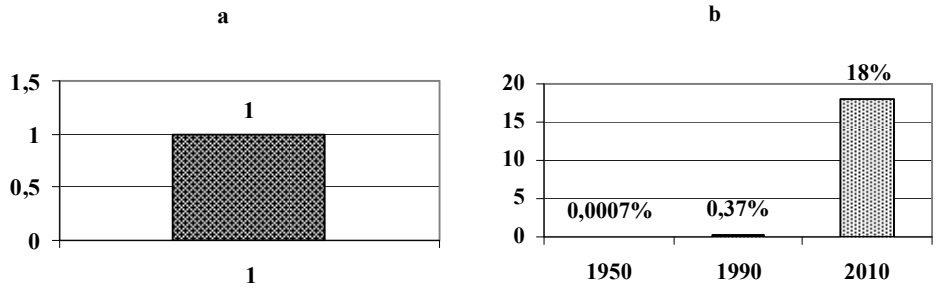


Fig. 3 a, b. Steps in the evolution of the ratio between the numerical growth of protected areas (a) and the rate of national geographic space cover (b).

Such a natural good aroused and still arouses the interest of European experts which imposed on competent Romanian authorities to conceive and promote legislative changes proper for the enlargement and the consolidation of the protected areas' network.

From a historical perspective, we can distinguish three periods, with variable numeric growth rates of protected areas (fig. 3a, 3b). From 1930, when act 213/1930 regarding Natural Monuments in Romania was established, until after the Second World War, 36 protected areas were set up, covering only 0.0007% of the national territory. In the interval 1950 – 1989, the number of protected areas increased visibly up to 463, but the covered area remained low, at only 0.37%. The most spectacular growth was between 1990 and 2010, when protected areas doubled

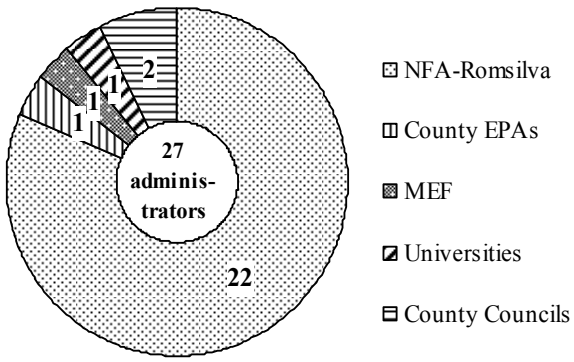


Fig. 4. The structure of institutions administrating national and nature parks.

their number, reaching approx. 1000, and covering 8% of the national territory, if we count only IUCN homologated areas and those administered by public institutions or NGOs, or almost 18% if we add all protected areas, inclusive the Natura 2000 sites, along with numerous entities suffering from the so-called "paper park syndrome".

Structurally, the Protected Areas National Network comprises 27 national and nature parks (13 national parks and 14 nature parks), from which three are internationally acknowledged as Biosphere Reserves in the UNESCO-MAB programme: Retezat National Park, Rodnei Mountains National Park, and the Danube Delta; furthermore, over 500 nature reserves, several hundred Natura 2000 sites, and other smaller protected areas (source: National Forrest Administration / NFA, Department for Protected Areas).

Numerous scientific reserves, Natura 2000 sites and natural monuments are placed inside national or nature parks, as well as other protected areas of national or local interest, a fact that is frequently causing contrasting statistical data, as they are included separately in various lists by some authors, while others count only the including protected area, regardless of the presence of other protected objectives within their boundaries.

National and nature parks administered by Forest Directorates

Table 2

Park	Forest Directorate	County
Maramureşului Mts. Nature Park	Baia Mare	Maramureş
Rodnei Mts. National Park	Bistriţa	Bistriţa-Năsăud
Călimani National Park	Suceava	Suceava
Vânători Neamţ Nature Park	Piatra-Neamţ	Neamţ
Cheile Bicazului – Hăşmaş National Park	Miercurea-Ciuc	Harghita
Putna Vrancea Nature Park	Focşani	Vrancea
Bucegi Nature Park	Târgovişte	Dâmboviţa
Piatra Craiului National Park	Braşov	BV
Cozia National Park	Râmnicu Vâlcea	Vâlcea
Buila Vânturariţa National Park	Râmnicu Vâlcea	Vâlcea
Jiului Gorge National Park	Tg. Jiu	Gorj
Grădiştea Muncelului – Cioclovina NP	Deva	Hunedoara
Retezat National Park	Deva	Hunedoara
Domogled – Valea Cernei National Park	Reşiţa	Caraş-Severin
Semenic – Cheile Caraşului National Park	Reşiţa	Caraş-Severin
Cheile Nerei – Beuşniţa National Park	Reşiţa	Caraş-Severin
Porţile de Fier Nature Park	Drobeta Tr.-Severin	Mehedinţi
Mureşului Meadow Nature Park	Arad	Arad
Apuseni Nature Park	Oradea	Bihor
Balta Mică a Brăilei Nature Park	Brăila	Brăila
Măcinului Mts. National Park	Tulcea	Tulcea
Comana Nature Park	Giurgiu	Giurgiu

Source: NFA-Romsilva.

Nowadays, the 27 national and nature parks are the responsibility of the Ministry of Environment and Forests (MEF / MMP). A new project, the Upper Mureş Gorge Nature Park, is still awaiting approval, and MEF will ascertain appropriate administrative structures.

The majority of them (22) are trusted for a 10-year administration (2004 – 2014) basing on a contract between MEF and NFA-Romsilva, functioning as subunits within the Forest Directorates (table 2), while five national and nature parks are administrated by other institutions (table 3), as shown in figure 4.

National and nature parks administered by other institutions

Table 3

Park	Administrator
Danube Delta Biosphere Reserve	Ministry for Environment and Forests
Lower Prut Water Meadow Nature Park	Environment Protection Agency Galaţi
Haţeg Country Dinosaurs Geopark	Bucharest University, Faculty of Geology
Mehedinţi Plateau Geopark	Mehedinţi County Council
Ceahlău National Park	Neamţ County Council

Source: NFA-Romsilva.

3. 2. Romanian difficulties of the integration in the European policy regarding protected areas

In order to fulfil accession conditions and to respect obligations assumed through international treaties, conventions, and agreements, Romania did not only have to create a strong net of natural protected areas, but also to make financial efforts to ensure an adequate management. And this is the exact point where a major contrast occurs between Romania's need to fully adjust to European environment policies, in order to have at least 15% of its territory covered with protected areas in a few years, and its financial capability to sustain an efficient management of those areas.

If the management of national and nature parks is realized through special administrative structures, the rest of the nature reserves may be administered through custody agreements. Unfortunately, statistics show that, by the end of 2009, for only 400 of the 1000 protected areas such agreements were signed. Furthermore, most of the 27 national and nature parks administered by NFA-Romsilva and other institutions (fig. 3) were confronted in past years with serious problems regarding insufficient financial resources, small number of specialists and field agents, common or individual property in protected areas, economic facilities in the parks (stone extraction, mining, wind turbines, small hydroelectric plants) etc., while the National Agency for Protected Areas, which leads the common and efficient management of these natural entities, is unable to realize its coordination strategies due to a lack of both financial resources and specialised personnel.

All that legitimate the following question: what will happen in the near future with the natural sites managed by (insufficient) specialists, but underfinanced, and all the more with the hundreds of Natura 2000 sites, with no administrators? All these problems lead us to the conclusion that the "paper park syndrome" for Romania's protected areas, as stated by European evaluators, is justified. Many protected natural entities, unfortunately, are only real on paper.

If we try to inventory the severe problems occurring in our national and nature parks, we may assess the following:

- in 2007, 2008 and 2009, the 22 national and nature parks administered by NFA-Romsilva faced some 3 to 4 month payment delays to administrative personnel (in January 2010, most of these park administrations did not pay their employees since September – October 2009);

- all national and nature parks are facing problems regarding properties on their territory; in Rodna Mountains National Park, for example, there are the "borderland woods", on behalf of which the Park's Administration is threatened at every meeting of the Advisory Council with legal actions by the representatives of local communities. A similar situation is found in the Apuseni Nature Park, where the "Motzi" (i.e. the indigenous inhabitants of the Apuseni Mountains core area) benefited from a special regime regarding wood exploitation;

- a special case occurs in Dobrogea, where EU financed wind farms were established inside several protected areas, and now they have to be removed;

- national and nature parks face an insufficient number of field agents, which impedes an efficient surveillance of the geographic space of protected areas. Each park needs 2 to 4 more field agents in order to reach a reasonable cover rate of the geographical area;

- shortage of field agents generates a rise of poaching in parks, illegal timber cutting, and information panel deterioration;

- in protected areas and Natura 2000 sites without any form of administration, there is a high risk for biodiversity elements to be diminished or even destroyed.

The issue of protected areas has to be analysed within the large and generous concept of eco-development, because protected natural entities are a fundamental and indispensable part of it. There is an interdependence relationship between protected natural areas and eco-development, and these two concepts have to be accepted and analysed together, according to their multi-dimensionality.

In our desire to highlight problems often occurring in protected areas outside national or nature parks, we choose the Izvorul Tăuşoarelor Cave, a very good example of a protected area for which speleologists have tried to find a notorious institution as a custodian. After several attempts were obstructed by both bureaucracy and indifference specific for our society, in February 2010 this morphologic-geographical marvel was legally committed to the custody of a prestigious cultural and scientific institution of the Bistriţa-Năsăud County – The Bistriţa-Năsăud Museum Complex. Meanwhile, other several hundred similar objectives are waiting for a better faith.

4. CASE STUDY – IZVORUL TĂUŞOARELOR CAVE

4. 1. General presentation

Discovered in 1955 by teacher Leon Bârte, the cave from Izvorul Tăuşoarelor immediately draw the interest of scientists in speleology and related fields, because of the special features of this endokarst. Explored by successive generations of speleologists, the cave aroused most interest in the 7th decade of the past century, when the morphism of this endokarst placed this site among the first in Europe, in terms of altitude and cavity extent, along with an abundance of bibliographical sources. The cave lost part of its attractiveness after 1985, when the interest of speleological research shifted towards other emerging endokarst.

The Eocene limestone holding the cave lies between the sandstone of the resurgence from Izvorul Rece, on the Telcişor valley, and the crystalline of Peak Bârlea, consisting of magmatic and metamorphic rocks, in an impermeable substratum. Between these two faults, the limestone containing intrusions of bituminous shale and sandy limestone (B. Onac, P. Cocean, 1994) is tectonically fissured along a joint pre-existent to the actual karstification (M. Domşa, 1990).

From the five speleogenesis factors, two predominates in this cave:

- incasion of Eocene lime strata, specific to this cave. The cause of incasion is not the usual corrosion – erosion of the basement, but the dynamic quaternary tectonic (M. Bleahu, 1982). The quantity of detritus caused by incasion is impressive, reaching hundreds of cubic meters, and can be seen in rooms at the intersection of joints or at ceiling collapse, as well as in fossil rooms. Incasion forms are preponderant (block impressions, stair-like ceilings, collapse bells, jointed rocks, insurgence shafts, etc.). Lithofraction has tectonic origin;

- advanced erosion of detritus. This erosion is intensified by the disposition of strata and joints, which are very slanted due to folding-induced orographic pressure, but also by the existence of a dendritic hydrographic net, comprising four actives, with a resurgence flow of over 500 l/sec. (P. Decei, 1983). The movement force of the actives transported the incasion detritus along with alluvial and pelithic sediments. Preponderant are phytogenic deposits in entrance-near galleries, and polygonal soil in active and ex-active galleries. Enormous quantities of detritus are being evacuated from the cave beyond the two sinkholes, on an area up to 4,8 km, as far as the resurgence. This geomorphological equation encouraged the hypothesis according to which beyond these sinkholes, vast endokarstic areas may exist, opening the possibility of the existence of a large underground lake, spring-fed by the four actives in the Izvorul Tăuşoarelor Cave and the active of the Jgheabul lui Zalion Cave (colouring with fluorescein, 18.07.1957 – I. Viehman, E. Silvestru, 1982; I. Viehman, 2004).

Nowadays, the cave extends on 20 km, having a drop of 413,5 m, calculated basing on laser telemetry measurements made in 2004 by the Romanian Speleology Federation (fig. 5). The cave is continuously explored by the Năsăud speleologists, which add hundreds of meters to the known cave every year.

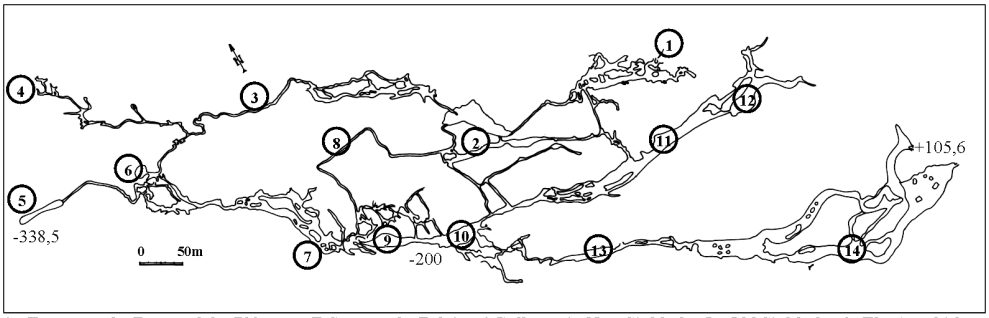
Scenically, the Izvorul Tăuşoarelor Cave is not among the most attractive ones in Romania, speleothems scarcely occur in the depths, only in Aladdin's Room from the New System, in the Student's System, or in the Bear Bones Room. Vast galleries along joints show relatively little corrosion, as alluvial deposition is specific, with sediment layers reaching up to 15 m, representing a real study potential for paleo-climatology. The rooms are wide, the fossil ones are being dominated by incasioned detritus, with no karstification elements, and the access is difficult because of detritus angularity and the succession of shafts.

The elements of scientific and touristic attraction of this site are given by the presence of some rare and very good preserved speleothems:

- mirabilite ($Na_2SO_4 \cdot 10H_2O$). These acicular crystals (also named "cave hair") occurred surprisingly late after the discovery of the cave, as an effect of microclimate changes caused by the clearing of a gallery ("the mousehole" in the Sasca Gallery). The mineral formed in the "Dining Room", at 200 m below entrance level, on a small area (5 m^2), with successive extensions toward the Sasaca Gallery. The origin of this, visually very spectacular, but also very instable mineral, was subject to several studies and hypotheses (M. Domşa, 1988; E. Silvestru, 1990);

- oulopholite. The name of these sulphurous precipitations may be confusing, as they are known in special literature as anthodite – stone (cave) flowers (we prefer "oulopholite", a term favoured by Marcian Bleahu, as being more exact, as it relies on the crystallographic structure of the speleothem, not only on the phytomorphic aesthetic). These fibrous speleothems, made of crystals shaped in the form of radial distributed petals constitute spectacular and very rare inflorescences (such forms occur scattered in Peştera Vântului or Wind Cave). The

arrangement of this precipitation form is very compact in this cave, in the Gypsum Gallery, in a "sack-bottom" like diverticulum, where tiny air streams favourd a lamellar precipitation of gypsum ($CaSO_4 \cdot 2H_2O$) (L. Jude, 1972; A. Moţiu, I. Viehmann, R. Strusiewicz, 1977; B. Onac, 1987). These oulopholite, together with mirabilite flowering in a nearby site, only 100 m away, represents one of the main scientific attractions of the karst and the main reason why the Romanian Academy set it in the level "A" protection category;



1 - Entrance; 2 - Room of the 700 steps, Z System; 3 - Belgians' Gallery; 4 - New Sinkhole; 5 - Old Sinkhole; 6 –The Amphitheatre; 7 - Sugar Cubes; 8 - the advancing gallery; 9 - Room of Spheres; 10 - Dining Room; 11 - Kilometer Gallery; 12 - Mountain Room; 13 - Gypsum Gallery; 14 - New System

Fig. 5. Plan of the Izvorul Tăuşoarelor Cave (after M. Domşa. C. Popa 1985).

- the calcareous nodules from Tăuşoare. The disposition and origin of these calcareous nodules represented in special literature a motif for long-lasting studies. These spheres lie separate from each other in the mass of incasioned detritus in the Room of Spheres. After a first evaluation considered them as being pebbles (despite the clear fossil character of the room), this theory has been abandoned when the same nodules were discovered embedded in the layer of Eocene lime (Mezei System, Room of Spheres) (C. Fabian, I. Viehmann, 1979; M. Mureşianu, 2004). The origin of these nodules was finally settled in 2004 by Cristian Muntean, researcher at the "Emil Racoviţă" Speleological Institute in Bucharest;

- the fossils deposit with *Ursus spelaeus* from the Bear Bones Room. Situated at a long distance from the entrance (4 km), this room contains a barely studied fossils deposit, in which bones from *Ursus spelaeus* (cave bear) and *Ursus arctos* (brown bear) were found togheter, in the same site and same period (M. Domşa, C. Popa, 1993). The fossils deposit in the Bone Room is one of the least investigated deposits in Romanian caves;

- cave fauna comprises amphipods, cyclopids, collembolans, and diplures. Chiropteras (mainly from the species *Myotis myotis* and *Rhinolophus hipposideros*) gather in the hibernation period in colonies counting over 4000 specimens (I. Viehmann, M. Şerban, 1963).

4. 2. Legislative and actual evolution of the protected area

Since the discovery of this impressive endokarst, the cave attracted hundreds of speleologists and scientists from all over Europe. The exploration campaigns reached their peak intensity in the '70s, when what was then considered the limit of this cavity was reached – the two terminal sinkholes and the Bone Room. Between this two limits, the mapping from

1982 – 1983, coordinated by geologists Mihai Domşa and Cristian Popa, reveals a altitudinal difference of -347,5 m, and in 1985, after setting the positive maximal limit, the drop reaches -461 m, a record for Romanian limestone karst in the category of horizontal caves (not to be confound with pit caves). In 2004, through telemetry, this vertical difference is corrected to 413,5 m, still maintaining the cave from Izvorul Tăuşoarelor on top of depth development in Romanian karst.

In the initial phase of exploration, this cave did not benefit from a special protection status. The entrance was unprotected, and only in 1970 a first wooden gate is erected. The cave is under the protection of researchers from the "Emil Racoviţă" Speleological Institute in Cluj-Napoca. The cave warden, Toma Târca, a villager from the Gersa Valley, was employed, who reveal real explorative qualities. In 1989, he was replaced by Pop George, and since 2004, the job has been assumed by priest Crin Theodorescu from Năsăud, member of the Romanian Speleology Federation and of several speleology clubs.

The Bistriţa-Năsăud County Museum (since 2004, Bistriţa-Năsăud Museum Complex) is the main legal entity carrying out the protection of this area, constantly employing warding personnel and sustaining speleological equipping campaigns. In 2005, through a financing from the Environmental Education Network, a new gate is installed, possessing, besides an urban planning certificate and a building licence, the advice from the Romanian Academy's Commission for Nature Monuments Protection, in compliance with the regulations of Act nr. 90 / 10.05.2000 regarding Romania's adhesion to the *Agreement on the Conservation of Bats in Europe*. Metal stairs are installed, replacing the wooden ones, as well as climbing equipment in compliance with the safety standards of the Romanian Speleology Federation, and many maintenance campaigns were undertaken (mainly evacuation of wastes and mineralised carbide soot, residues of decades of exploring campaigns and empirical, environment-destroying tourism).

In all this period, the cave has also benefitted from the attention of a territorial-administrative unit. Regarding functionality, the cave is seen as "resource" (R. Tercafs, 2003). The City Hall and the Local Council of Telciu, as beneficiaries of the capitation of the Izvorul Rece resurgence and as monitors of this location, collaborate with the Museum Complex for the protection of the area.

The uncertain statute of the cave ends with the coming into effect of Act nr. 5/2000 which, in the national territory planning project, section III (protected areas), includes the cave from Tăuşoare with 71 hectares protected, code 2.206, Rebrişoara community, Bistriţa-Năsăud County. This protection refers mainly to the surface area influencing the karstification of the cave. This benefits the protection of the endokarst, because the storms in the '80s that destroyed the conifer forest above, cause well-known phenomena: an increase in the concentration of minerals, anorganic compounds and salts, the alteration of the hydrologic regime and the increase of drained water acidity, followed by re-dissolution, occurrence of eggutation holes on speleothems in the percolation area, etc. Unfortunately, even if Act 5/2000 ensures the protection of the area, it doesn't offer practical solutions regarding custody and the responsibilities of institutions with competence in the management of the protected area.

In compliance with Minster's Decree nr. 604/04.07.2005, the Minister of the Environment assigns to the Izvorul Tăuşoarelor Cave the protection class "A" (pos. 63/2.206). Related to the Government Enactment nr. 236/24.11.2000, this statute implies the interdiction of any planning or changes of natural factors, as the cave may be "the object of speleological explorations, scientific research or ecotourism, based on authorisations and with respect to

management regulations and plans" (art. 31, par. a). These stipulations could not have been implemented, because the elaboration of the management plan for the protected area and of the associated regulations can be done only by the curator of this area. According to the stipulations of Act nr 462/18.07.2001, as it is not part of a national or natural park, or of a biosphere reserve, the cave can be administered by virtue of a custody arrangement with the central authority for environment protection. Unfortunately, the intercession of the Museum Complex was stopped due to lack of methodology, which becomes available only in 2003, through Decree nr 850/27.10.2003 of the Minister for Agriculture, Forests, Waters and Environment regarding custody assignation of natural protected areas. This decree includes, in Annex nr 2, our site. Another legal step follows through Decree nr 1964/13.12.2007 regarding the conference of protected area statute to sites of public importance, which integrates the cave from Izvorul Tăuşoarelor in the European ecological network Natura 2000 (SAC – Special Areas of Conservation), established through the *Habitats Directive* (Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora). Under these circumstances, the cave receives the indicative **ROSC10193 Peştera Tăuşoare**.

Another decree (nr. 1533/2008 from the Minister for Environment and Sustainable Development) stipulates the methodology for custody granting of protected areas (exactly our case). This methodology demands a long list of documents requiring great technical implication. As such, the most resource- and time-consuming activity was the elaboration of a plan regarding activities following custody receiving, a plan which implied a perfect knowledge of the protected area and the articulation of dozens of papers published by several scientific factors, in order to cover a wide range of scientific interests. Fortunately, the dossier of the Museum Complex relied on data gathered in two decades of applied speleology in this protected area. We believe that, without this experience, the performance of the conditions imposed by the authority for environment in order to grant custody could not have been possible.

The submission of the custody dossier was followed by granting custody to the Museum Complex Bistriţa-Năsăud and by signing of the agreement nr. 0012/23.02.2010.

This custody means a great responsibility. The elaboration of the management plan and of the functioning regulations for the protected area require strong and real-time collaboration with the institutions involved in scientific and technical actions from Cave Tăuşoare – faculties from various universities, the two departments of the "Emil Racoviţă" Speleological Institute, or the Romanian Speleology Federation and the Romanian Salvaspeo Corps (CORSA/RSACO, cave rescue team). We intend to elaborate research and documentation projects with all these institutions, with dual purpose: scientific exploration of this unique site, and its protection in compliance with environmental regulations.

The deficiencies of the custody granting system for protected areas (particularly those that do not require the establishment of separate administration structures), as determined through the above-mentioned experience, are:

- for a requirement-based positive evaluation, the authority for environment is expecting a very good acquaintanceship with the protected area, certified by recommendations from institutions and authorities in the field of interest. This inhibits initiatives of NGOs or individuals, as it assumes, somehow, an ongoing environment protection activity, which not all interested bodies can have;

- the compulsion of elaborating a plan of measures that will be adopted in the protected area, in order to achieve a positive evaluation of the candidature, assumes, implicitly, an exhaustive knowledge of all scientific data, either from own research or from institutions involved in the research of the area, which is, in most cases, impossible at this stage;

- the custody granting methodology does not explicitly (but only through the implicit effect of environment regulations) distinguish between the custody of class A or class B protected areas in the endokarst. This difference is given by the class A special status, which forbids tourism activities, without offering to a potential curator any encouraging facilitations. Therefore, most speleological protected areas will be of class B, where the curator's activities can be balanced through touristic incomes;

- another law-abiding deficiency is the very short interval between the application start and the custody granting session. This discourages many institutions, individuals, or NGOs to apply the legally required documentation. That explains why, in Bistrița-Năsăud County, the cave from Izvorul Tăuşoarelor is the only site assigned into custody in the February 2010 session.

5. CONCLUSIONS

Present times require concrete involvement in protection of nature, resulting in the establishment of as many as possible protected areas with an efficient, benefic and productive management.

Financial and economic constrictions in a large number of states worldwide generate a major contrast between the total number of protected areas "on paper" and the number of such entities with an actual administration.

Romania, as an EU member state, possesses a national network of legally designated protected natural areas, created in order to preserve and to sustainably utilize the natural heritage, a major objective of public interest and a fundamental component of the national strategy for sustainable development.

Unfortunately, due to the absence of medium and long-term national environmental strategies and, implicitly, because of insufficient financial resources and qualified personnel for the management of protected areas, many of them remain only on-paper-entities, so that Romania joins the group of countries suffering from the "paper park syndrome".

A unique protected area in Romania, with an exceptional scientific value, the Izvorul Tăuşoarelor Cave in the Rodnei Mountains clearly proves that, in most cases, even if there are people fighting for attaching protected natural entities to prestigious institutions through custody agreements, legal and bureaucratic limitations can obstruct or delay such actions.

In respect of all this, our efforts regarding the protection of nature must overcome the declamation of circumstantial slogans and have to rapidly result in concrete actions, meant to prevent and to stop the rate in which human activities can irreversibly destroy nature or, in some cases, to rebuild destroyed habitats through ecological reconstruction.

R E F E R E N C E S

1. Bleahu, M. (1982), *Relieful carstic,* Edit. Albatros, Bucureşti.
2. Decei, P. (1983), *Pe plaiuri şi văi carpatine*, Edit. Albatros, Bucureşti.
3. Domşa, M. (1988), *Geneza mirabilitului din Peştera Tăuşoare, Munţii Rodnei*, Buletin CSER Cluj-Napoca, „Peştera" nr.2, Tipografia Agronomia, Cluj-Napoca.

4. Domşa, M. (1990), *Noi date asupra geologiei Peşterii de la Izvorul Tăuşoarelor din Munţii Rodnei, România*, notă preliminară, Buletin CSER Cluj-Napoca, „Peştera" nr.3, Tipografia Agronomia, Cluj-Napoca.
5. Domşa, M., Popa, C. (1993), *New bears remains discovered in Romanian caves*, Buletinul Ştiinţific al Societăţii Ardelene de Speologie, Tipografia Agronomia, Cluj-Napoca.
6. Fabian, C., Viehmann, I. (1979), *Morphogenese des billes calcaires dans la grotte Tauşoare (Monts Rodna, Roumanie)*, Travaux des Institut de Spelèologie „E. Racoviţă", Nr.XVIII, Bucureşti.
7. Jude, L. (1972), *Les anthodites des Monts de Rodna*, Travaux des Institut de Spelèologie „E. Racoviţă" nr. XI, Bucureşti.
8. Moţiu, A., Viehmann, I., Strusiewicz, R. (1977), *Dècouverte des nouves mineraux dans la grotte Tăuşoare (Monts Rodna)*, Travaux des Institut de Spelèologie „E. Racoviţă" nr.XVI, Bucureşti.
9. Mureşianu, M. L. (2004), *Izvorul Tăuşoarelor – cea mai adâncă peşteră din ţară*, Terra Magazin, nr. 2, Bucureşti, pp. 22-24.
10. Mureşianu, M.L., Schuster, E., Hădărău, A. (2006), *Ökotourismus im Rodna-Gebirge-Nationalpark - grundlegende Dimensionen des nachhaltigen Entwicklungs-Konzeptes*, Studii şi Cercetări (Bistriţa-Năsăud), Seria Geologie-Geografie, Bistriţa.
11. Mureşianu, M.L., Schuster, E. (2007), *Strategien zur Förderung der ökologischen Entwiclung im Rodna-Gebirge-Nationalpark*, Studia Universitatis Babes-Bolyai. Geographia, 2, Cluj-Napoca.
12. Onac, B., Cocean, P. (1994), *Une vue global sur le karst roumain*, Kras I speleologia, XVII, Katowice, Poland.
13. Pop, P. Gr. (2000), *Carpaţii şi Subcarpaţii României*, Edit. Presa Universitară Clujeană, Cluj-Napoca, 2000.
14. Tercafs, R. (2003), *Protecţia domeniului subteran, principii de conservare şi instrumente de management*, Editura Presa Universitară, Cluj-Napoca.
15. Silvestru, E. (1990), *On the genesis and evolution of mirabilite in The Cave of Tăuşoare (Romania)*, Travaux des Institut de Spelèologie „E. Racoviţă" nr. XXIX, Bucureşti.
16. Silvestru, E., Viehmann, I. (1982), *Ètude de microtectonique comparée dans la karst des Monts Rodna (Roumanie)*, Travaux des Institut de Spelèologie „E. Racoviţă" nr. XXI, Bucureşti.
17. Viehmann, I. (2004), *Speleogie generală*, Presa Universitară Clujeană, Cluj-Napoca.
18. Viehmann I., Şerban M., 1962-1963. *Notă preliminară asupra Peşterii Izvorul Tăuşoarelor*, Lucrările Institutului Speologic „Emil Racoviţă", III, Bucureşti.

STUDIA UBB GEOGRAPHIA, LVI, 2, 2011

THE ASSESSMENT OF GEOMORPHOSITES OF TOURIST INTEREST IN THE TRASCĂU MOUNTAINS

GABRIELA COCEAN[1], V. SURDEANU[2]

ABSTRACT. – The Assessment of Geomorphosites of Tourist Interest in the Trascău Mountains. When it comes to the inventory and assessment of geomorphosites, there is a wide choice of methods that can be applied, but none of them have the general approvement and recognition. There are however five methods, developed by the members of the Geosites working group from the IAG that were more intensely promoted. There have been authors that tried to extract the common features of these methods, in terms of evaluation criteria and general method of assessment, but have not been entirely successful. Some of these methods may be using criteria that are too subjective, or too vaguely expressed, others have their limitations due to the omission of some criteria, while others contain errors in the notation scales or even formulas. Under these circumstances, we propose a new method of assessment, that represents a nuanced approach, based on the structural values of a geomorphosite, leading to the functional ones. In the first category we include the geomorphic values of the site, the aesthetic and the ecological ones, that is, the intrinsic features of the site. The second group of values focuses on the features derived from the first ones, the functional values, represented by the scientific, cultural and economic values. For quantifying each of these values, specific indices are to be used, numerically expressed on a 0 to 1 scale.

Keywords: *geomorphosites, assessment, value, criteria.*

1. INTRODUCTION

In regards to the inventory and assessment methods of geomorphosites, one can notice the absence of a generally accepted method. This is due first of all to the final goals of such methods that are rarely similar, and second, to the case studies, that contain different potential geomorphosites, for some of which the authors have established and applied specific criteria.

However, there are five most important methods proposed by members of the IAG working group on Geomorphological Sites, from the Universities of Modena and Reggio Emilia, Cantabria, Valladolid, Lausanne and Minho.

Studying these methods closely, one can easily agree with Reynard E. (2009) "In all different types of assessment methodology there is, therefore, inevitably a degree of subjectivity since the true value of these environmental elements cannot really be measured".

[1] *Babes-Bolyai University, Faculty of Geography, 400006, Cluj Napoca;. Romanian Academy - Cluj Branch, Department of Geography, Cluj Napoca, Romania. E-mail: ela_cocean@yahoo.com*

[2] *Babes-Bolyai University, Faculty of Geography, 400006, Cluj Napoca, Romania, e-mail; surdeanu@ geografie.ubbcluj.ro*

2. THEORETICAL AND METHODOLOGICAL FUNDAMENTAL ASPECTS

2. 1. The method of the Modena and Reggio Emilia University

This method, developed in 2005 by Paola Coratza and Cecilia Giusti is the simplest one, since it assesses only the scientific value of the geomorphosites. This value was determined using the following criteria: value for scientific research, educational value, area occupied by the site, rareness, integrity, exposure of the site and added values. The additional elements included in the evaluation of the scientific value are geological, historical, cultural or economic relevance, and a value assessing the existing protection of the site.

One can therefore notice that many of the criteria above are not reflective part of the scientific interest. Even if they would be considered appropriate for the assessment of the scientific importance, the method would still be suitable only for pure scientific hierarchy, not for assessing geomorphosites in terms of tourist purposes.

2. 2. The method of the Valladolid University

In the same year, E. Serrano and J.J. Trueba Gonzalez developed a different method for evaluating geomorphosites in the Picos de Europa National Park. This is a more complex method, and it consists of three parts dedicated to scientific value, additional value and value for use and management. The scientific value is followed through criteria such as genesis, morphology, dynamic, chronology, lithology, geological and sedimentary structures, while additional values are constituted by the cultural or aesthetic features, educational and scientific importance, representativeness of the site and the tourist attraction that it can generate.

The third part, referring to the use and management of the geosite, tries to evaluate the accessibility and conditions of observation, but also the intensity of use, fragility, vulnerability, risk of degradation, the current status of conservation of the site and limits of acceptable change. One can notice an incomplete organization of the criteria in the first part, in terms of numerical evaluation, with the use of different scales among groups, and incomplete explanation of the application of scores for some criteria, such as the association with other elements of heritage.

In addition, the final quantification of the geomorphosites from Picos de Europa seems to be just an intermediate result, the values are not summed up to a general value, and therefore the results obtain are of the type: ”(i) high intrinsic and added values with medium or low use value; (ii) medium-high intrinsic, added and use values; (iii) medium-low intrinsic and added value with high use value; and (iv) low intrinsic, added and use values.”

Thus, the geomorphosites can only be asigned to one of these groups, not graded or ranked, therefore no individual hierarchy can be completed. In addition, the selected criteria make the method seem like a way of directing a region's heritage conservation policy, so it cannot be applied for the assessment of geomorphosites of tourist interest.

2. 3. The method of the Cantabria University

That same year, another method was developed by Viola Maria Bruschi and A. Cendrero. This method remains to date the most complex and widely applicable method, more so since applied, with certain differences in the final calculation in two studies of different goal: an Environmental Impact for motorways and the inventory of geomorphosites from the province of Cantabria.

As the previous method, it also has three parts, focusing on the intrinsic qualities and use of geomorphosites, but instead of the additional values, that are included in the first group, the third section is related to potential threats and necessary protection.

Criteria from the first part, seeking assessment of the intrinsic geomorphological values are rareness, scientific knowledge of the site, exemplarity, diversity of elements of interest, type-locality, integrity and age. The intrinsic quality of the geosite also includes what other authors name additional values, grouped in two criteria: association with cultural (historical, archaeological, artistic) heritage and also with natural heritage (elements of fauna, flora and association across the landscape).

The second phase of the inventory aims to establish the potential for use of the geomorphosite by evaluating the following aspects: the number of potential activities, observation conditions, accessibility, area, the proximity of service centers and the socio-economic conditions ot the area in comparison with the national average.

Finally, the necessary protection from the potential threats includes the number of inhabitants within a radius of 25 kilometers, present or potential threats posed by new infrastructure projects and urban territorial development, relationship with existing planning, the possibility for travelers to collect items, mining interest in the area and property type.

A first observation to be made is the correlation of the highest coefficient of rating with the highest level of risk. The real problem is that these values are added in the final formula to the ones obtained in the previous parts, and therefore the most exposed geomorphosite will have an advantage.

This would be a correct reasoning given that we want to achieve the list of priority sites for protection, but not for a scientifical hierarchy, or a geotouristic approach, cases in which these potential threats are a disadvantage, and should be indicated by being assigned negative values.

Although being a complex method, which covers various aspects of the geomorphosites' features, it has a disadvantage coming from the fact that the additional qualities are out of focus, participating only in the quantification of the intrinsic value, and so they only slightly influence the final outcome. This makes the method inappropriate for assessing geomorphosites in their relation to tourism.

2. 4. The method of the Minho University

A year later, a new method was used by P. Pereira, later developed in collaboration with D. Pereira and M. I. Caetano Alves for the geomorphological heritage assessment of Montesinho Natural Park.

This method avoids certain criteria used in previous methods, as the authors consider some of them, like size or age, as not defining geomorphological features, and instead evaluate the geomorphological value (the scientifical and additional values) and the management value (use and protection).

Thus, in order to quantify the scientific value, rareness, rareness at national level, integrity, representativeness of geomorphological processes, diversity, other geological interest, scientific knowledge are assessed. The additional value is composed by the cultural features in general, aesthetic and ecological values.

The use value includes criteria such as accessibility, visibility, present use of the geomorphological and of other natural and cultural interests, legal protection and use limitations, facilities and services, while the protection value will be analysed in terms of integrity and vulnerability of the site.

The authors use a differential rating of the criteria, the maximum grades being different, as acording to the importance of the criteria.

On closer analysis, one can notice the same qualities that are targeted by several criteria, such as rareness, evaluated at a regional and national level, or the presence of the same criteria in two different sections, for instance integrity, included in the scientific value as well as in the protection one.

2. 5. The method of the Lausanne University

In 2007, E. Reynard had a more simple approach, applicable for different regions in various purposes: tourism, environmental analysis or scientific inventories. It is quite a concise method, focused on assessing the scientific and additional values.

The scientific value of geomorphosites is evaluated using four criteria, which can often be found in the bibliography: rareness, integrity, representativeness and exemplarity and paleogeographic value.

Ecological value (importance to ecosystems, environmental impacts and existing protection), aesthetics (in terms of lookout points and structure forms), cultural (religious, historical, artistic, geohistorical) and economic value are all considered additional values.

Risk and management measures, protection and tourism promotion are taken into account in the final calculation of the overall value.

The method is indeed correct and widely applicable, but we consider that selected criteria do not cover all aspects of geomorphosites, especially in their relationship with tourism.

2. 6. The method developed by J. P. Pralong

A method more likely to fit our study could be the one developed by J.P. Pralong in 2005, which focuses on the tourist value more than on the general value of geomorphosites, evaluating the landscape, scientific, cultural and economic features.

The criteria used for assessing the landscape value are the number of lookout points, the average distance between them, the surface (as specified will be used different scales between the objectives), elevation and color contrast with site surroundings.

The scientific value is represented by paleogeographic interest, representativeness, area, rarity, integrity and ecological interest. The cultural value includes the values given for the presence of cultural and historical customs, iconographic representations, historical, archaeological, religious and methaphysical relevance, art and cultural events. The economic value is composed by criteria such as: accessibility, natural hazards, annual number of visitors, the level of protection and the attraction of visitors.

In a successive stage, the use value is assessed by evaluating the level of utilization (the area used, number of facilities, seasonal employment, hours of use per day) and the actual operating mode of landscape values, scientific, cultural and environmental.

At first glance, this method seems to be covering the essential points of the evaluation of a tourist attraction, but we believe that important issues are not achieved in this assessment, starting from certain geomorphological features, to the promotion of the geomorphosites as tourist resources, or human activities that could affect their value.

In addition, some of the attributes that have numerical values attached are too vague, large- medium-low scale is not always suitable for the granting of a value or another leaving room for interpretation.

3. A NEW ASSESSMENT METHOD

Since, as noted in the considerations related to each method, none of them fully meets our desire for the assessment of geomorphosites in the Trascău Mountains, in their relationship with tourism, we identify the need for a new method of assessment, based on a thorough selection of elements of maximum sustainability of each method, and developed by introducing several new elements. The method also proposes a new organization of target values and it can have a wide applicability.

It is characterized by the separation of the intrinsic values and the derived ones. Thus, the first category, of the ***structural values*** will only contain the features of the sites, the geomorphological, aesthetic and environmental values. The second part of the evaluation refers to the ***functional values,*** attributes given after human perception or exploitation, whether through research, offering a scientific and educational value to the site, either through the past exploitation of the site as buiding ground, as a place of faith and of arts or as a tourist resource.

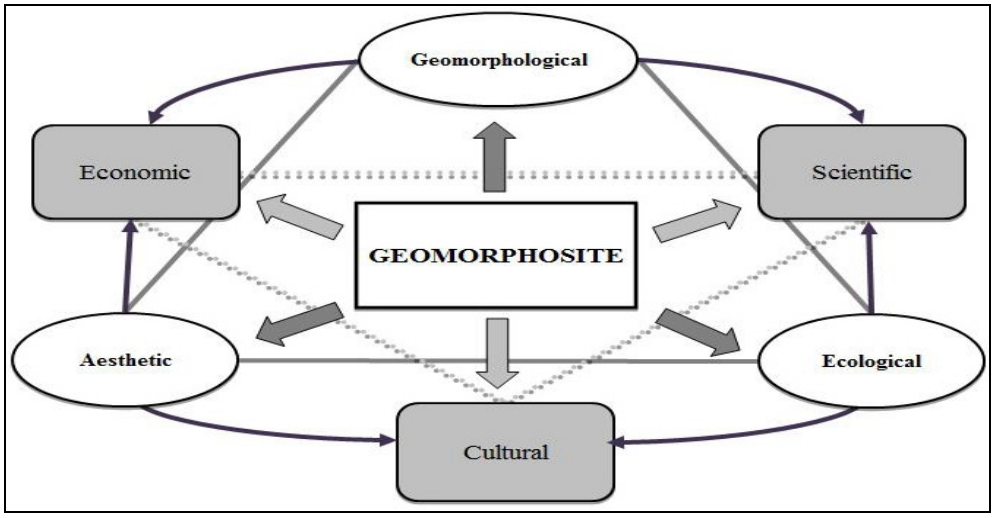


Fig. 1. Values of geomorphosites.

We can easily notice that the second category of values derives from the structural ones, the scientific value is built on the geomorphological, aesthetics and ecological, the cultural derives from the geomorphology of the site that allowed living since ancient times and then preserved the remains, the aestethic form and the vegetal association inspired creators of art and spiritual values. Today all of those features can represent important tourist resources, therefore economic assets.

The two following tables include specific criteria for each of the types of values mentioned above, with their basic features. For each of them, there have been established five categories of quantitative indices designed to quantify the attributes of each feature on a numerical scale from 0 to 1,. The overwhelming majority of the analysed traits are positive, therefore they participate in shaping the geomorphosites' strengths.

There are however a number of characteristics with the opposite effect, negative attributes, which reduce the value of the site. They are deducted from the sum of the positive values in the final formula. Only then an accurate value of each geomorphosite is obtained.

The structural values of geomorphosites

Table 1

Geomorphologic (VS1)	Genesis (VS1a)	1.00	Complex multifactorial genesis
		0.75	Genesis involving at least three morphogenetic factors
		0.50	Genesis involving at least two morphogenetic factors
		0.25	Genesis involving one relevant morphogenetic factor
		0.00	Common genesis
	Dynamic \(VS1b)	1.00	Landforms with an accelerated dynamic
		0.75	Landforms with a moderate, perceptible dynamic
		0.50	Landforms with a slow, deductible dynamic
		0.25	Fossil landforms
		0.00	Undeveloped landforms
	Complexity (VS1c)	1.00	Five or more than five elements of interest
		0.75	Four elements of interest
		0.50	Three elements of interest
		0.25	Two elements of interest
		0.00	One element of interest
	Dimensions (VS1d)	1.00	The national standard
		0.75	The regional standard
		0.50	Close in size to the standard
		0.25	Medium size
		0.00	Small size
	Integrity (conservation) (VS1e)	1.00	The geosite is not affected
		0.75	The geosite is slightly affected
		0.50	The geosite is moderately affected
		0.25	The geosite is strongly affected
		0.00	Destroyed forms
	Rareness (VS1f)	1.00	Unique site world wide
		0.75	Unique site in the country
		0.50	Unique site in the region
		0.25	Unique site in the area
		0.00	Common site
	Structure (VS1g)	1.00	Complex, unique structure
		0.75	Particular structure
		0.50	Rare structure
		0.25	Interesting structure
		0.00	Simple structure

Aesthetic (VS 2)	Physiognomy (VS2a)	1.00	Unique physiognomy
		0.75	Particular physiognomy
		0.50	Interesting physiognomy
		0.25	Common physiognomy
		0.00	Not attractive physiognomy
	Elevation (VS2b1)	1.00	> 500m
		0.75	300-500 m
		0.50	100-300m
		0.25	25-100m
		0.00	< 25m
	Cave configuration (VS2b2)	1.00	Ample, labyrinthine caves
		0.75	Ample, linear caves
		0.50	Ample, vertical caves
		0.25	Minor labyrinthine caves
		0.00	Simple caves
	Color (VS2c)	1.00	Chromatic contrast
		0.75	Chromatic puzzle
		0.50	Chromatic accordance
		0.25	Color gradient
		0.00	Monochrome
	Visibility (VS2d)	1.00	Panoramic percieved element
		0.75	Element percieved from the panoramic lookout points
		0.50	Selectively percieved element
		0.25	Punctual percieved element
		0.00	Restrictively percieved element
Ecologic (VS 3)	Flora (VS3a)	1.00	Presence of relict plants in the perimeter
		0.75	Presence of endemic plants in the perimeter
		0.50	Presence of major plant associations in the perimeter
		0.25	Presence of minor plant associations in the perimeter
		0.00	Affected biotope (agriculture, deforestation, etc) or no plant associations
	Fauna (VS3b)	1.00	Unique biotope with particularly rich fauna on a national scale
		0.75	Unique biotope with rich fauna on a regional scale
		0.50	Presence of rare species
		0.25	Presence of common species
		0.00	No representative fauna
	Protection (VS3)	1.00	Fully protected area
		0.75	Generalised protection
		0.50	Selective protection
		0.25	Limited, natural protection
		0.00	No kind of protection

New features were introduced for the better assessment of intrinsic values, such as physiognomy, caves configuration or color. Other criteria, that may be mentioned in other methods, were reconsidered and strictly ranked, assessing scores according to their true significance.

An explanation is required for the differential use of two aesthetic criteria: the elevation in consideration to the surrounding landscape for evaluating surface landforms such as massifs, ridges, slopes and valleys, for which the aesthetic value is very much influenced by this vertical display, while for the underground forms such as caves, pit caves and salt mines (where suitable) their configuration is the most relevant. We are dealing in this case with a rather complex parameter, the volume of forms and how it is set (large chambers, horizontal or vertical galleries or passages, linear or labyrinthine etc.

Calculation of the structural value of the geomorphosite is done by using the following formula: VS=VS1+VS2+VS3, where: VS = Structural value; VS 1 = Geomorphological value; VS 2 = Aesthetic value; VS 3 = Ecological value.

Each of these values is also the sum of index values assigned to their own characteristics. Thus, the geomorphological value, VS 1, for example, consists of: VS1 = VS1a + VS1b + VS1c + VS1d + VS1e + VS1f +VS1g.

The functional values of geomorphosites

Table 2

Cultural (VF 1)	Historical (VF1a)	1.00	Nationally relevant historic place
		0.75	Regionally relevant historic place
		0.50	Locally relevant historic place
		0.25	Not relevant historic place
		0.00	No historic significance or remains
	Archaeological (VF1b)	1.00	Prehistoric site
		0.75	Ancient site
		0.50	Medieval site
		0.25	Site of minor relevance
		0.00	No site in the perimeter
	Religious (VF1c)	1.00	Medieval monastery
		0.75	Cathedral
		0.50	Church
		0.25	Recent religious elements
		0.00	No religious relevance
	Symbolic relevance (VF1d)	1.00	A symbol identifies with the geosite
		0.75	The symbol is directly associeted with the geosite
		0.50	The symbol is discretly associeted
		0.25	The symbol is indirectly associeted with the geosite
		0.00	No symbols associated
	Artistic (VF1e)	1.00	Over 50 representations of the geosite in literature, paintings, graphics or photography
		0.75	30-50 representations
		0.50	10-30 representations
		0.25	<10 representations
		0.00	No representation of the geosite

	Associated events (VF1f)	1.00	One major event
		0.75	More than one annual event
		0.50	One annual event
		0.25	Occasional events
		0.00	No events in the perimeter
	Architectural (VF1g)	1.00	Recognised rural site
		0.75	Traditional arhitecture
		0.50	Modern particular arhitecture
		0.25	Common arhitecture
		0.00	No arhitectural value
Scientific (VF 2)	Scientific significance (VF2a)	1.00	Major scientific significance (at least one scientific theory related)
		0.75	Recognised scientific significance (object of at least 5 research papers
		0.50	The geosite has been the object of at least one research paper
		0.25	The geosite has been occasionaly mentioned in research papers
		0.00	Not mentioned in bibliography
	Scientific resource (VF2b)	1.00	Recognised survey potential
		0.75	Considerable survey potential
		0.50	Medium survey potential
		0.25	Modest survey potential
		0.00	Completly used up in terms of survey
	Formative resource (VF2c)	1.00	Wide target group
		0.75	Medium target group, composed by experts
		0.50	Medium target group
		0.25	Small target group
		0.00	No estimated target group
	Usefullness as model (VF2d)	1.00	Model of maximum relevance
		0.75	Model of important relevance
		0.50	Model of average relevance
		0.25	Common exemple
		0.00	The site is not used as a model
	Representativeness (VF2e)	1.00	International representativeness
		0.75	National representativeness
		0.50	Regional representativeness
		0.25	Local representativeness
		0.00	Non representative form
	Paleontological (VF2f)	1.00	Complex paleontological remains in the geomorphosite
		0.75	Well preseved and abundent paleontological remains in the perimeter
		0.50	Abundent paleontological remains
		0.25	Modest paleontological remains
		0.00	No paleontological remains

Economic = touristic (VF 3)	Possible tourist activities (VF3a)	1.00	> 5 different activities
		0.75	4 activities
		0.50	3 activities
		0.25	2 activities
		0.00	One activity
	Tourist potential (VF3b)	1.00	National landmark
		0.75	Regional landmark
		0.50	Regional attractive resource
		0.25	Local landmark
		0.00	Landscape background
	Accessibility (VF3c)	1.00	Vehicle access to the site
		0.75	Vehicle access up to 500 m from the site
		0.50	Vehicle access up to 1-3 km
		0.25	More than 3 km by footpath
		0.00	Very difficult access
	Accommodation infrastructure (VF3d)	1.00	Modern lodgings in the perimeter
		0.75	Modest lodgings in the perimeter or modern one within 5 km
		0.50	Modest lodgings within 5 km
		0.25	Lodgings more than 5 km away
		0.00	Lodgings more than 10 km away
	Arrangement and services (VF3e)	1.00	Arrangement and modern services within the perimeter
		0.75	Equipment and modern services outside the perimeter
		0.50	Equipment or modern services outside the perimeter
		0.25	Poor equipment
		0.00	Total lack of equipment
	Distance from modern centres with complex services (VF3f)	1.00	< 5 km
		0.75	5-10 km
		0.50	11-25 km
		0.25	26-50 km
		0.00	>50 km
	Socio-economic features of the region (VF3g)	1.00	Centre of over 100 000 inhabitants within 25 km from the geosite
		0.75	Centre of over 50 000 inhabitants within 25 km from the geosite
		0.50	Centre of over 25 000 inhabitants within 25 km
		0.25	Centre of over 10 000 inhabitants within 25 km
		0.00	Centre of less than 10 000 inhabitants within 25 km
	Status of current tourism exploitation (VF3h)	1.00	Permanent and complex exploitation
		0.75	Complex seasonal exploitation
		0.50	Permanent and simple exploitation
		0.25	Simple seasonal exploitation
		0.00	Simple occasional use

	Site promotion (VF3i)	1.00	Complex international promotion
		0.75	National complex promotion
		0.50	Regional promotion
		0.25	Local promotion
		0.00	The site is not promoted
	Sport competitions (VF3j)	1.00	One major competition
		0.75	More than one annual competition
		0.50	One annual competition
		0.25	Occasional competions
		0.00	No competition in the perimeter

There are significant reevaluations in this group by including the scientific, cultural and economic values, as part of the functional values, each of them being composed of a series of features. Thus, it should be noted that the cultural relevance has been evaluated using specific criteria for each of its features including historic, artistic, arhaelogical, arhitectural, etc.

In quantifying the scientific value, the separation of the criteria strictly related to this value from the ones evaluating the geomorphologic value, avoiding therefore duplication is very important. We also propose a different rating or grading of the criteria that are common to other methods, assigning scores according to their true meaning.

The features evaluated in the assessment of the economic value have been selected according to the relevance for tourism. Thus, some criteria used by other authors have been avoided, for instance form of land ownership, which we consider irrelevant, as a private or nationalized form does not have an impact upon the structure and the function of the geosite.

The structural value of each geosite is calculated using the following formula: VF=VF1+VF2+VF3, where: VF = Functional value; VF 1 = Cultural value; VF 2 = Scientific value; VF 3 = Economic (touristic) value. Similar to the previous group of values, each of the mentioned values represents the sum of the specific criteria, for instance, the cultural value has the following formula: F1 = VF1a + VF1b + VF1c + VF1d + VF1e + VF1f +VF1g

Another aspect to be taken into account is some factors acting restrictively on the value and potential of the geosite. They will be assessed separately, since their value is substracted in the final formula. Risks and vulnerability, the presence of factors that could decrease the attractiveness of the site and economic activities or negatively charged infrastructures are all restrictive attributes.

The numerical expression of restrictive attributes represents the sum of the included parametres: AR=AR1+AR2+AR3+AR4 where AR = Restrictive attributes; AR1 = Natural and anthropic risks; AR2 = Vulnerability; AR3 = Presence of economic activies that might affect tourism; AR4 = Inaesthetic elements

Restrictive attributes

Table 3

	Natural and anthropogenic hazards (AR1)	1.00	Non controllable risks
		0.75	Potential distructive risks
		0.50	Controllable risks

Restrictive Attributes AR		0.25	Incipient risks
		0.00	No risc
	Vulnerability (AR2)	1.00	The site can be destroyed
		0.75	The site could be partially destroyed
		0.50	The site could be strongly affected
		0.25	The site is vulnerable but cannot be strongly affected
		0.00	The site is not vulnerable
	Factors that could decrease the attractiveness of the site (AR3)	1.00	Industrial exploitation
		0.75	Logging
		0.50	Irrational farming
		0.25	The exploitation of water resources
		0.00	No such factors
	Unsightly elements (AR4)	1.00	Abandoned industrial infrastructure
		0.75	Industrial residues and waste
		0.50	Degraded buildings
		0.25	Minor unsightly elements
		0.00	No such elements

Thus, the global value of a geomorphosite is calculated using the following formula: VG=VS+VF-AR, where: VG = Global value of the geomorphosite; VS = Strctural value of the geomorphosite; VF = Functional value of the geomorphosite; AR = Restrictive attributes.

Considering the characteristics and criteria mentioned above, each of them having its own scaling of the five units, we consider that the proposed method provides sufficient posibilities of an accurate assessment of the geomorphosites in their relationship with tourism.

4. CONCLUSION

The applicability of this method was tested in the Trascău Mountains, where 93 geomorphosites were assessed. The first 20 were selected for further analysis, whose aggregated properties reveal the following hierarchy (table 4.).

We notice among them the presence of various geomorphosites in terms of structure and function, the importance of the intrinsic value for some elements: Turzii, Întregaldelor, Râmeț and Arieș Gorges, Huda lui Papară Cave, Vânătarele Ponorului, Pietrele Ampoiței, or of the structural values for others: Colții Trascăului, Pleaşa Râmețului-Pleaşa Cetii, Mănăstirii Gorges, Piatra Craivii.

First 20 geomorphosites in the Trascău Mountains

Table 4

Crt. no.	Geomorphosite	Structural values			Functional Values			AR	Total
		VS1	VS2	VS3	VF1	VF2	VF3		
1	Turzii Gorges	4,75	3,25	2,75	3,25	4,75	7,50	1,25	**25,00**
2	Colții Trascăului	4,50	3,75	1,00	3,75	4,25	7,75	1,75	**23,25**
3	Râmețului Gorges	5,75	2,75	2,25	1,75	4,75	6,25	0,75	**22,75**

4	Arieşului Gorge	5,25	3,50	1,00	2,75	4,50	6,50	1,50	**22,00**
5	Pietrele Ampoiţei	3,75	2,25	1,50	2,50	4,50	6,75	1,25	**20,00**
6	Întregaldelor Gorge	4,25	2,50	2,25	1,75	4,00	4,50	1,00	**18,25**
7	Pleaşa Râmeţului - Piatra Cetii	4,50	3,25	2,00	2,50	3,75	4,50	2,75	**17,75**
8	Vânătarele Ponorului	6,25	2,25	1,25	1,50	3,75	4,00	2,00	**17,00**
9	Bedeleu Scarp	4,00	3,25	1,00	1,25	4,25	4,5	1,75	**16,50**
10	Piatra Craivii	3,00	2,50	1,75	3,50	4,00	3,00	1,25	**16,50**
11	Huda lui Papară Cave	4,75	2,75	1,75	0,50	3,50	4,25	1,75	**15,75**
12	Ighiu Lake	4,25	1,75	2,00	0,75	4,25	5,00	2,50	**15,50**
13	Dâmbău	4,50	3,00	0,75	0,50	3,25	4,25	1,50	**14,75**
14	Ampoiţei Gorges	2,50	1,50	2,00	1,75	2,75	4,50	0,50	**14,50**
15	Mănăstirii Gorges	2,00	2,25	1,00	3,00	3,25	5,00	2,00	**14,50**
16	Colţeşti fortress	1,75	1,50	1,00	3,00	2,50	5,25	0,75	**14,25**
17	Corabia	4,00	3,00	0,75	0,50	3,25	4,00	1,50	**14,00**
18	Piatra Bulbuci	4,00	2,25	1,25	1,50	2,25	3,00	0,50	**13,75**
19	Ampoiului Gorge	2,75	2,00	0,50	1,50	3,25	5,50	2,00	**13,50**
20	Turului Gorge	3,25	2,00	1,75	2,00	2,75	4,25	2,50	**13,50**

The application of the method revealed a hierarchy of the different types of geomorphosites consistent with their structural and positional potential, which is a particularly important fact in terms of decision making for planning and integrating these geosites within the actual tourism practice.

R E F E R E N C E S

1. Bruschi, V.M., Cendrero A., (2005), *Geosite evaluation: can we measure intangible values*? In Il Quaternario, Italian Journal of Quaternary Sciences / Geomorphological Sites and Geodiversity, Vol 18 (1) 2005, Volume Speciale.
2. Bruschi, V.M., Cendrero, A., (2009), *Direct and parametric methods for the assessment of geosites and geomorphosites* In Reynard, E., Coratza, P., Regolini-Bissig G., (editors) Geomorphosites, Verlag Dr. Friedrich Pfeil, Munchen.
3. Comănescu, Laura, Dobre, R. (2008), *Inventorying, Evaluating and Tourism Valuating the Geomorphosites from the Central Sector of the Ceahlău National Park*, GeoJurnal of Tourism and Geosites, II, 3, 1, Oradea.
4. Coratza, Paola. (2003), *Siti geomorfologici: ricerca, valutazione e valorizzazione, Esempi in Emilia-Romagna*, Tesi Dottore Ricerca, Universita Modena e Reggio Emilia, Dipartimento Scienze della Terra.
5. Coratza Paola, Giusti, Cecilia (2005), *Methodological proposal for the assessment of the scientific quality of geomorphosites*, In Il Quaternario, Italian Journal of Quaternary Sciences / Geomorphological Sites and Geodiversity, Vol 18 (1) 2005, Volume Speciale.
6. Panizza M, Piacente Sandra (2005), *Geomorphosites: A bridge between Scientific Research, Cultural Integration and Artistic Suggestion*. Il Quaternario, Italian Journal of Quaternary Sciences Geomorphological Sites and Geodiversity, Vol 18 (1) 2005, Volume Speciale.

7. Pereira, P., Pereira, D., Caetano Alves M.I. (2007), *Geomorphosite assessment in Montesinho* Natural Park Geographica Helvetica Jg. 62 2007/Heft.
8. Pralong J.P. (2005), *A method for assessing tourist potential and use of geomorphological sites* Géomorphologie: relief, processus, environnement, 3/2005
9. Pralong, J.P., Reynard, E., (2005), *A proposal for a classification of geomorphological sites depending on their tourist value*. In Il Quaternario, Italian Journal of Quaternary Sciences / Geomorphological Sites and Geodiversity, Vol 18 (1) 2005, Volume Speciale.
10. Reynard, E., (2004), *L'evaluation des geotopes geomorphologiques en Suisse*. In Reynard, E., Pralong, J.P., (2004) Paysages geomorphologiques, Lausanne, Institut de Geographie, Travaux et recherches n 27.
11. Reynard E., Panizza M., (2005), *Geomorphosites: definition, assessment and mapping*. An introduction - Geomorphologie. Relief, processus, environment 3/2005.
12. Reynard, E., (2009), *The Assessment of Geomorphosites,* In Reynard, E., Coratza, P., Regolini-Bissig G., (editors) (2009) Geomorphosites, Verlag Dr. Friedrich Pfeil, Munchen.
13. Serrano E., González-Trueba J.J. (2005), *Assessment of geomorphosites in natural protected areas: the Picos de Europa National Park (Spain)*. Geomorphologie. Relief, processus, environnment, 3/2005.

Note: The authors wish to thank for the financial support provided from programs co-financed by The SECTORAL OPERATIONAL PROGRAMME HUMAN RESOURCES DEVELOPMENT, Contract **POSDRU 6/1.5/S/3 – „**Doctoral studies: through science towards society**".**
The authors wish to thank for the support provided throw the IDEI P.CE Project, 2465-2010.

STUDIA UBB GEOGRAPHIA, LVI, 2, 2011

THE NATURAL GROWTH OF THE POPULATION OF ROMANIA BETWEEN 1989 AND 2008

GR. P. POP[1]

ABSTRACT. – The Natural Growth of the Population of Romania between 1989 and 2008. This paper takes into account the essential aspects regarding the evolution of the natural growth of the population of Romania, focusing on *the birth rate, the mortality* and *the natural increase or decrease*, between 1989 and 2008. Before analysing these issues, some general aspects related to the period between 1930 and 1985 have been pointed out. It comes out that *the birth rate* was highest in the years 1930 (31.4‰), 1967 (27.4‰), 1968 (26.7‰) etc., and lowest in the years 1966 (14.3‰), 1980 (18.0‰), 1985 (15.8‰) etc. Regarding *the mortality*, the highest values (closer to 20.0‰) were maintained until the year 1950 (12.4‰), while afterwards the recorded values were around 10.0‰, and the lowest value was recorded in 1966 (8.2‰). Directly related to the birth rate and the mortality rate in this period, *the natural increase* recorded important variations, as the highest rate was registered in the years 1967 (18.1‰) and 1968 (17.1‰), because birth control had been imposed in Romania in 1966, while the lowest rate was recorded in 1940 (7.1‰) and after 1975, for example in the year 1985, when it was only 4.9% (table 1). During twenty years (1989-2008), the period of time of the analysis of this phenomenon*, the natural growth of the population of Romania* recorded an important alteration, due to the instauration of a new social and political system in the country, and the cancellation of the birth control in Romania, after the December 1989 events. It was for the first time in the demographic evolution of Romania when there was a transition from the positive values to negative values of the natural growth of population. *The turning point was the year 1992, when this indicator recorded* – **0.2‰** (fig. 1). Analyzing generally, one notices that after three years (1989-1991) of *positive natural increase*, for the next 17 years (1992-2008) there was a *constantly negative natural growth* reaching the lowest value in 2002 (- 2.7‰), while values of less than - 2‰ or close to it were registered in the years 1996, 2003, 1997, 2001, 2004, 2005, etc. Regarding the elements conditioning the *natural increase*, it comes out that *the birth rate* decreased from 16.0‰ (1989) and 13.6‰ (1990) to values around 10.1‰-11.0‰, in most of the analyzed years, while the *mortality* reached the highest value in 1966 (12.7‰) and the lowest in 1990 (10.6‰). Within these limits the most frequent values were between 11.1-12.0‰, recorded in 12 out of the 20 analyzed years (table 2). Along with the specific characteristics at national level, this paper brings into discussion aspects regarding the components of the natural growth of the population of Romania, at the level of counties, for the years 1992, 1996, 2002 and 2008 (table 3). Maps have been drawn up, focusing on the natural increase, for the years 1992 and 2002, selected as turning points (fig. 2 and 3).

Keywords: *Romania, counties, evolution, birth rate, mortality rate, natural increase*.

1. INTRODUCTION

Under normal environmental and social-historical factors, **the natural increase**, in which the birth rate plays the leading part, holds the essential role in the evolution of the number of inhabitants of any inhabitable territorial entity. For this reason, it is important to

[1] *Babeş-Bolyai University, Faculty of Geography, 400006, Cluj-Napoca, Romania, e-mail: grigor@geografie.ubbcluj.ro*

study different aspects of the natural increase, stressing on the numerical and spatial evolution of population during different periods of time. First, in order to highlight the analyzed issue, we bring into discussion some of the most significant moments concerning the natural growth of the population of Romania between 1930 and 1985 (table 1).

The natural growth of the population of Romania between 1930 and 1985

Table 1

Year	Live births		Deaths		Natural increase		Infant deaths per 1000 live-births	
	No.	‰	No.	‰	No.	‰	No.	‰
1930	482084	31.4	272649	19.3	209435	14.8	84639	175.6
1940	414235	26.0	300722	18.9	113513	7.1	…	…
1950	426820	26.2	202010	12.4	224810	13.8	49795	116.7
1955	442864	25.6	167535	9.7	275329	15.9	34653	78.2
1960	352241	19.1	160720	8.7	191521	10.4	26680	74.6
1965	278362	14.6	163393	8.6	114969	6.0	12264	44.1
1966	273678	14.3	157445	8.2	116233	6.1	171243	46.6
1967	527764	27.4	179129	9.3	348635	18.1	24590	46.6
1968	526091	26.7	188509	9.6	337582	17.1	31317	59.5
1970	427034	21.1	193255	9.5	233779	11.6	21110	49.2
1975	418185	19.7	197538	9.3	220647	10.4	14498	34.7
1980	398904	18.0	231876	10.4	167028	7.6	11691	29.3
1985	358797	15.8	246670	10.9	112127	4.9	9191	25.6

Thus, the **birth rate**, usually indicated by relative values, recorded the highest value in 1930 (31.4‰), and afterwards it began to decrease gradually, to 26.0‰ in 1940, then to 25.6‰ in 1955 and recorded only 14.3‰ in 1966, when the birth control was introduced in Romania. As a result of this legislation (Decree No. 779 in the autumn of the year 1966), there was an increase of the birth rate, up to 27.43‰ in 1967. Later, this indicator (as a result of the counter-reaction of the population to the above-mentioned decree) decreased to 15.83‰ in 1985. The second component of the natural increase of the Romanian population, **the mortality,** which recorded values of 19.3‰ in 1930, 18.9‰ in 1940 and 12.4‰ in 1950, decreased to values under 10.0‰ or just above the value of 10,0‰, between 1955 and 1988 (table 1).

Due to the above-mentioned birth and mortality rates (table 1), **the natural increase** of the population was characterized by important variations between 1930 and 1988. Higher values were recorded in 1930 (14.8‰), 1955 (15.9‰), and then it decreased to only 6.0‰, in 1965. As a result of this situation, as mentioned before, birth control was introduced in 1966, leading to exaggeratedly high values of the analysed indicator, 18.1‰ in 1967 and 17.1‰ in 1967. At the same with the decrease of the birth rate, as the mortality rate was rather constant, the natural increase gradually went down, from one year to another. Its recorded value was 7.6‰ in 1980 and 4.9‰ in 1985.

The facts presented in the previous synthesis, which provide a general context of the situation, allow the analysis of different means of expressing the phenomenon related to the *natural growth of the Romanian population* (the birth rate, the mortality rate and the natural increase) between 1989 and 2008. It is characterized by totally different conditions, as compared to those before 1990, especially the period between 1966 and 1989. During that period, the first component of the natural increase – the birth rate - was placed under severe supervision by the social and political system of that time, which led to the recording of very high values of the natural increase, three times higher in 1967 (18.1‰), and almost three times higher (17.1‰) in 1968, than the value registered in 1965 (6.0‰).

2. THE NATURAL GROWTH OF THE POPULATION OF ROMANIA BETWEEN 1989 AND 2008

In order to highlight the evolution of the natural growth of the Romanian population, expressed by the following indicators – *the birth rate, the mortality rate* and *the rate of natural increase*, it is necessary to mention the fact that during the first days of the December 1989 events it „escaped" from the condition imposed by the Decree on birth control in the autumn of the year 1966. The result was a substantial decrease of the birth rate, in a very short period of time.

The natural growth of the population of Romania, between 1989 and 2008

Table 2

Years	Total inhabitants	Live-births	‰	Deaths	‰	Natural increase	‰
1989	23151564	369544	16.0	247366	10.7	122238	5.3
1990	23206720	314746	13.6	247086	10.6	67660	3.0
1991	22760449	275275	11.9	251760	10.9	23515	1.0
1992	22788993	260393	11.4	263855	11.6	-3462	-0.2
1993	22755260	249994	11.0	263323	11.6	-13329	-0.6
1994	22730622	246736	10.9	266101	11.7	-19365	-0.8
1995	22680951	236640	10.4	271672	12.0	-35032	-1.6
1996	22607620	231348	10.2	286158	12.7	-54810	-2.5
1997	22545925	236891	10.5	279315	12.4	-42424	-1.9
1998	22502803	237297	10.5	269166	12.0	-31869	-1.5
1999	22458022	234600	10.4	265194	11.8	-30594	-1.4
2000	22435205	234521	10.5	255820	11.4	-21299	-0.9
2001	22408393	220368	9.8	259603	11.6	-39235	-1.8
2002	21794793	210529	9.7	269666	12.4	-59137	-2.7
2003	21733556	212459	9.8	266575	12.3	-54116	-2.5
2004	21673328	216261	10.0	258890	11.9	-42629	-1.9
2005	21623849	221020	10.2	262101	12.1	-41081	-1.9
2006	21584365	219483	10.2	258094	12.0	-38611	-1.8
2007	21537563	214728	10.0	251965	11.7	-37237	-1.7
2008	21504442	221900	10.3	253202	11.8	-31302	-1.5

In order to get to know better the analysed phenomena (birth rate, mortality rate and natural increase), first we provide an analysis at *national level* for the period 1989-2008 (table 2 and fig. 1). Then, the analysis will take into account the various territorial expressions of the phenomenon, by highlighting the territorial distribution of the natural increase *at county level* for the years 1992, 1996, 2002 and 2008 (table 3) and of the years 1992 and 2002, also at county level (fig. 2 and 3).

2. 1. The natural growth of the population at national level

It is very well highlighted due to the synthesis provided by tables and figures (table 2 and fig. 1), which emphasize the basic characteristic features of the *birth rate, mortality rate and the rate of natural increase* for the 20 years of the period 1989-2008, at national level.

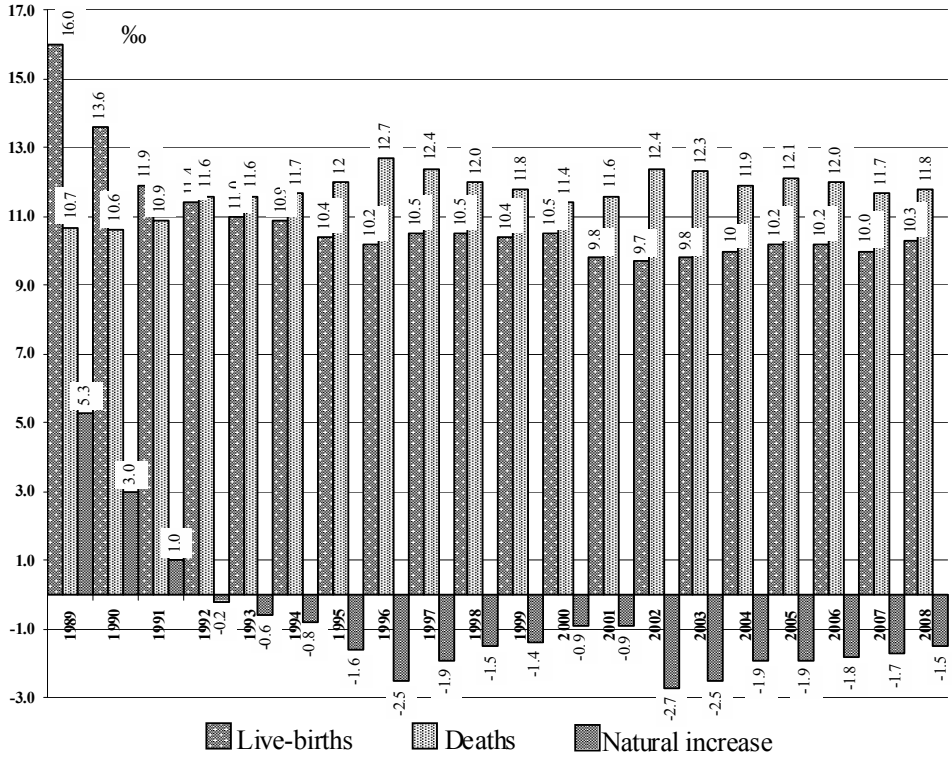


Fig.1. The natural growth of the population of Romania between 1989 and 2008.

2. 1. 1. The birth rate (live-births/l000 inhabitants) is an essential element of the natural increase of the population. Relatively normal, it maintained the characteristics of the previous period, as the values were higher in 1989 (16.0‰) and 1990 (13.6‰). Then it recorded values of 11.9‰ and 11.4‰ during the following two years (1991 and 1992). During the next years, the birth rate, except for the 2001-2004 period (9.7-10.0%), registered values between 10.1 and 11.0‰. It comes out that the highest recorded birth rate was 16.0‰ (369544 live-births in absolute numbers) in 1989, while the lowest value of the birth rate was 9.7‰ (210529 live-births), in 2002.

2. 1. 2. The mortality rate (deaths/1000 inhabitants). As for the second element of the natural increase – *the mortality rate* – during the twenty analyzed years (1989-2008), one may notice that it recorded similar values. The highest value was 12.7‰ in 1996 (286158 deaths) and the lowest value was 10.6‰ in 1990 (247086 deceased persons). Regarding the frequency of the years within these limits, one remarks that the values of the mortality rate varied between 12.1 and 13.0‰ in five years (25%), between 11.1 and 12.0‰ in 12 years (60%) and between 10.1 and 11.0‰ in three years (15%) (table 2).

2. 1. 3. The rate of natural increase of the population of Romania between 1989 and 2008, representing the difference between the birth rate and the mortality rate, was characterized by positive values during the first three years of the analyzed period (5.3% in 1989, 3.0% in 1990 and 1.0% in 1991). Then, for the first time in the history of geodemography in Romania, in 1992, it recorded a *negative value* of **-0.2‰** that came out from the birth of 260393 people (11.4‰) and the death of 263855 people (11.6‰), so that the absolute value of the natural increase was -3462.

During the following years, the rate of natural increase continued to record negative values. The lowest registered value was -2.7‰ (9.7‰, 210529 live-births and 12.4‰, 269666 deaths) in 2002. Values under -2.0‰ were also recorded in 1996 and 2003 (-2.5‰), while values above -1.0‰ characterized the years 1993, 1994 and 2000 (table 2).

2. 2. The natural growth of the population at county level

Naturally, the natural growth of the population, analyzed at county level as compared to the more general level of Romania, is characterized by rather different values from one situation to the other. In order to better highlight the essential features regarding the analyzed issue, the statistical data have been aggregated in synthetic tables, concerning the years 1992, 1966, 2002 and 2008 (table 3). Based on these data, maps have been drawn for a better cartographic view of the analyzed phenomenon (fig. 2 and 3) for the years 1992 (when a negative rate of natural increase was for the first time recorded in Romania, **-0.2‰**) and 2002 (when the highest negative value of the rate of natural increase at national level was recorded, -2.7‰).

Starting from the synthesis presented in the two materials (table 3 and figures 2 and 3), we consider that it is appropriate to detail the issue concerning the *birth rate, mortality rate* and *the rate of natural increase*, for the years 1992, 2002 and 2008, at county level, making also reference to the geographical-historical provinces in certain cases. As for the year 1996, the readers who are interested will have the opportunity to analyze the issue themselves (based on table 3).

2. 2. 1. The components of the natural growth of the Romanian population in 1992

The birth rate of the analyzed year was 11.4‰ at the level of Romania. The highest values were recorded in the counties of Suceava, **15.2‰** and Vaslui, 14.5‰ (both of them in Moldova), Bistriţa-Năsăud, 14.2‰ (Transylvania) and Maramureş, 14.1‰ (Maramureş), while the lowest values were registered in Bucharest[1], **7.9‰** and the counties of Cluj, 10.0‰, Braşov, 9.9‰ (Transylvania) and Brăila, 9.6‰ (Muntenia). Other eight counties had high values of the birth rate (12.1-14.0‰): Bacău, Botoşani, Iaşi, Neamţ and Vrancea (Moldova), Sălaj (Transylvania), Satu Mare (Maramureş) and Gorj (Oltenia). The other 25 counties of Romania had a birth rate between 10.1-12.0‰, around the national average value. At the level of the geographical-historical provinces, they lie in Transylvania (Alba, Covasna, Harghita, Hunedoara, Mureş and Sibiu), Banat (Arad, Caraş-Severin and Timiş), Crişana (Bihor), Moldova (Galaţi), Dobrudja (Constanţa and Tulcea)

[1] *Together with Ilfov Agricultural Sector*.

Vital statistics of Romania, by counties and national level, in 1992, 1996, 2002 and 2008

Table 3

Crt. no.	Counties	1992				1996				2002				2008			
		Total	B	M	Ni	Total	B	M	Ni	Total	B	M	Ni	Total	B	M	Ni
1	Alba	412673	11.6	11.9	-0.3	403494	10.0	12.7	-2.7	385880	8.9	12.6	-3.7	379928	9.3	11.8	-2.5
2	Arad	486835	10.3	15.7	-5.4	477711	9.5	15.1	-5.6	462427	9.0	14.4	-5.4	457257	9.9	13.3	-3.4
3	Argeş	679361	11.8	10.7	1.1	677246	10.1	11.6	-1.5	652950	9.1	11.8	-2.7	643762	9.0	11.3	-2.3
4	Bacău	739146	13.9	9.4	4.5	745463	12.1	10.9	1.2	727230	11.0	11.5	-0.5	718125	10.9	11.3	-0.4
5	Bihor	638560	11.8	14.5	-2.7	6285014	10.7	14.8	-4.1	603143	10.1	13.8	-3.7	593431	11.0	12.7	-1.7
6	Bistriţa-Năs.	328020	14.2	9.9	4.3	327262	12.7	10.8	1.9	318315	10.9	10.7	0.2	316787	11.3	10.3	1.0
7	Botoşani	463218	14.0	12.3	1.7	461793	12.6	14.3	-1.7	462730	12.9	13.0	-0.1	451199	11.3	12.4	-1.1
8	Braşov	644970	9.9	9.0	0.9	637463	8.6	9.8	-1.2	592491	9.1	10.3	-1.2	596642	11.2	10.0	1.2
9	Brăila	363633	9.6	11.0	-1.4	389881	8.8	12.9	-4.1	375898	8.4	12.5	-4.1	362352	8.4	12.8	-4.4
10	Buzău	517557	11.4	12.2	-0.8	510718	10.0	14.2	-4.2	500160	9.2	13.6	-4.4	484724	9.5	13.2	-3.7
11	Caraş-Sever.	375560	10.3	13.4	-3.1	362498	9.2	13.8	-4.6	335936	9.2	13.1	-3.9	325269	8.9	12.8	-3.9
12	Călăraşi	339789	11.2	12.9	-1.7	334164	10.1	15.0	-4.9	320087	10.7	14.2	-3.5	313626	11.2	13.7	-2.5
13	Cluj	729023	10.0	12.0	-2.0	726790	8.9	12.2	-3.3	689738	8.0	12.5	-4.5	691989	9.7	11.4	-1.7
14	Constanţa	742980	10.3	9.0	1.3	747122	9.5	10.3	-0.8	713783	9.8	10.6	-0.8	720303	11.6	10.4	1.2
15	Covasna	234511	11.2	11.5	-0.3	231872	10.7	11.9	-1.2	225724	10.9	11.4	-0.5	222978	11.3	11.3	0.0
16	Dâmboviţa	560271	11.9	11.9	0.0	555410	10.5	13.0	-2.5	541431	9.8	12.6	-2.8	530849	10.0	15.7	-5.7
17	Dolj	761220	10.8	13.5	-2.7	751938	9.7	14.5	-4.8	730214	8.8	14.7	-5.9	708504	9.1	13.8	-4.7
18	Galaţi	639803	11.9	9.2	2.7	641561	10.9	10.8	0.1	626277	9.4	11.0	-1.6	611590	9.5	10.8	-1.3
19	Giurgiu	311672	10.8	15.4	-4.6	300615	10.3	17.9	-7.6	291784	8.9	16.3	-7.4	282554	10.0	15.7	-5.7
20	Gorj	395734	12.8	10.9	1.9	396990	11.3	12.2	-0.9	387335	9.8	11.3	-1.5	378871	8.6	10.5	-1.9
21	Harghita	349050	12.0	11.4	0.6	344323	10.6	12.3	-1.7	330325	10.5	11.9	-1.4	325089	11.4	11.4	0.0
22	Hunedoara	549433	11.6	11.4	0.2	543848	10.0	12.4	-2.4	493760	8.5	12.5	-4.0	468318	8.5	12.1	-3.6

Crt. no.	Counties	1992				1996				2002				2008			
		Total	B	M	Ni	Total	B	M	Ni	Total	B	M	Ni	Total	B	M	Ni
23	Ialomița	305603	11.3	12.2	-0.9	304985	10.9	13.4	-2.5	294757	10.1	12.8	-2.7	288725	11.9	13.2	-1.3
24	Iaşi	811647	13.5	9.2	4.3	822573	12.5	11.0	1.5	805330	12.9	10.4	2.5	826552	12.8	9.9	2.9
25	Ilfov[1]	-	-	-	-	277476	8.9	14.4	-5.5	275893	9.6	12.8	-3.2	304045	12.3	11.6	0.7
26	Maramureş	541710	14.1	11.2	2.9	535124	12.2	11.4	0.8	520635	10.3	11.3	-1.0	511828	10.7	10.3	0.4
27	Mehedinți	332440	11.4	13.2	-1.8	327521	10.2	14.2	-4.0	309183	9.0	13.8	-4.8	295248	8.8	14.0	-5.2
28	Mureş	610585	11.4	12.0	-0.6	604263	10.3	13.0	-2.7	588359	10.5	13.0	-2.5	581267	11.5	11.8	-0.3
29	Neamț	581313	13.1	9.9	3.2	584780	11.2	11.1	0.1	575767	10.1	11.6	-1.5	564291	9.9	11.3	-1.4
30	Olt	524833	11.5	13.3	-1.6	517597	10.7	14.6	-3.9	494707	8.5	14.7	-6.2	470709	8.2	14.1	-5.9
31	Prahova	878496	10.5	11.4	-0.9	868099	9.3	12.4	-3.1	835745	9.0	12.5	-3.5	817632	9.2	11.9	-2.7
32	Satu Mare	401371	12.6	13.5	-0.9	394133	10.8	13.5	-2.7	374086	10.2	13.6	-3.4	365535	11.3	12.2	-0.9
33	Sălaj	366795	12.5	14.2	-1.7	261040	10.9	15.2	-4.3	250014	10.8	14.0	-3.2	242493	11.1	12.7	-1.6
34	Sibiu	449526	11.6	10.2	1.4	444873	9.8	10.6	-0.8	423860	10.2	11.2	-1.0	423606	11.2	10.8	0.4
35	Suceava	704431	15.2	10.3	4.9	710845	13.4	11.1	2.3	707242	12.2	10.8	1.4	706407	12.1	10.4	1.7
36	Teleorman	484352	10.4	15.5	-5.1	470280	9.0	17.5	-8.5	437862	7.7	18.1	-10.4	407377	7.7	16.8	-9.1
37	Timiş	691005	10.1	12.7	-2.6	692645	9.2	13.0	-3.8	662590	8.7	11.7	-3.0	674533	10.7	11.2	-0.5
38	Tulcea	270739	11.3	11.0	0.3	266897	9.7	12.5	-2.8	255816	9.9	12.5	-2.6	249022	9.4	11.7	-2.3
39	Vaslui	463966	14.5	10.4	4.1	462703	13.3	12.8	0.5	464943	13.0	12.1	0.9	452528	11.3.4	11.4	-0.1
40	Vâlcea	439051	11.6	11.4	0.2	435274	10.3	12.8	-2.2	419635	8.2	12.9	-3.7	408942	8.4	11.4	-3.0
41	Vrancea	394926	13.1	11.1	2.0	392571	11.2	12.7	-1.5	396002	9.4	11.8	-2.4	391574	10.2	11.7	-1.5
42	Bucharest M.	2343105	7.9	11.2	-3.3	2037278	7.4	12.0	-4.6	2210342	7.6	11.4	-3.8	1943981	10.7	11.0	-0.3
43	**Romania**	**22788993**	**11.4**	**11.6**	**-0.2**	**22607620**	**10.2**	**12.7**	**-2.5**	**21794793**	**9.7**	**12.4**	**-2.7**	**21504442**	**10.3**	**11.8**	**-1.5**

Note: **B** = Birth rate; **M** = Mortality rate; **Ni** = Natural increase rate; Bistrița-Năs. = Bistrița-Năsăud; Caraş-Sever. = Caraş-Severin; Bucharest M. = Bucharest municipality.

[1] In 1992, together with Bucharest municipality.

Muntenia (Argeş, Buzău, Călăraşi, Dâmbovița, Giurgiu, Ialomița, Prahova and Teleorman) and Oltenia (Dolj, Mehedinți, Olt and Vâlcea).

The mortality rate, with a value of 11.6‰ at national level, is characterized by highest values in two of the counties located in the West, Arad (**15.7‰**) and Bihor (14.5‰), and another one in North-West, Sălaj (14.2‰), situation determined by the phenomenon of population ageing, and two counties in the South, Teleorman (15.5‰) and Giurgiu (15.4‰), because of the high infant mortality rate. Values of the mortality rate below 10.0‰ have been recorded in seven counties: Bacău (9.4‰), Galați (9.2‰), Iaşi (9.2‰) and Neamț (9.9‰), in Moldova, Bistrița-Năsăud (9.9‰) and Braşov (**9.0‰**) in Transylvania. These low values were generally caused by the phenomenon of rejuvenation of the population of these counties.

In 19 of the 41 administrative units of Romania, the mortality rate is comprised between 10.1 and 12.0‰: Alba, Harghita, Hunedoara, Mureş and Sibiu (Transylvania), Maramureş (Maramureş), Suceava, Vaslui and Vrancea (Moldova), Tulcea (Dobrudja), Argeş, Brăila, Dâmbovița, Prahova and Bucharest (Muntenia), Gorj and Vâlcea (Oltenia), while in 10 the mortality rate is between 12.1-14.0‰: Timiş and Caraş-Severin (Banat), Satu Mare (Maramureş), Botoşani (Moldova), Buzău, Călăraşi and Ialomița (Muntenia), Dolj, Mehedinți and Olt (Oltenia).

The rate of natural increase, analyzed at county level and sometimes at the level of the geographical-historical provinces, recorded rather different values from one situation

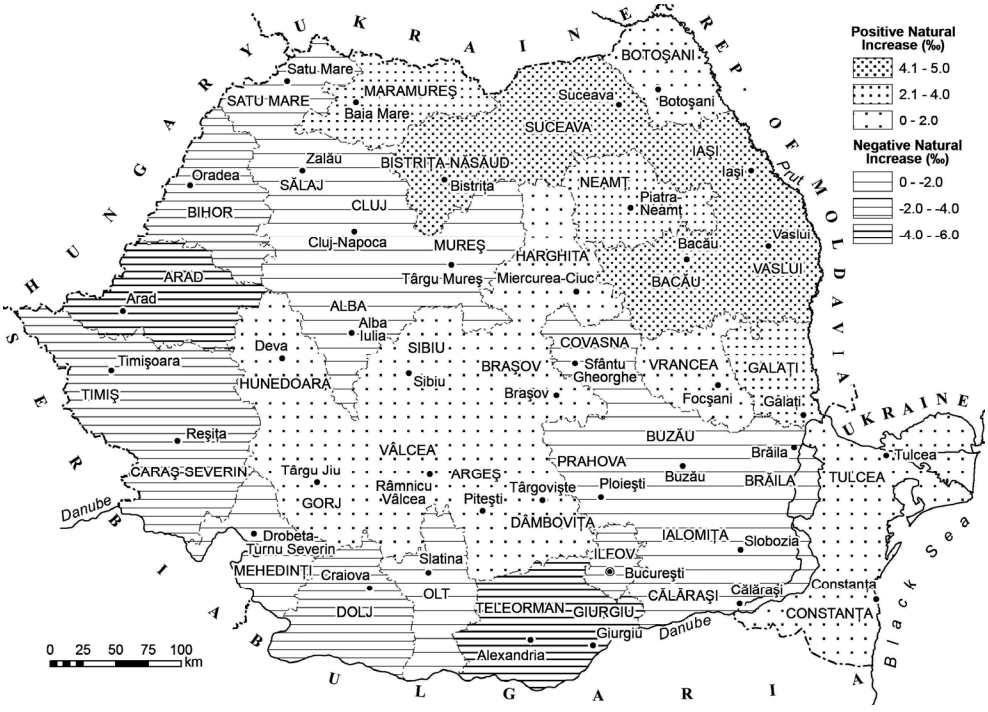


Fig. 2. The natural increase rate of the Romanian population, in 1992 (the names written in capital letters are counties, while those written in lower case are the corresponding county seats).

to the other compared to the national average of – **0.2‰**. First, one should notice the presence of *positive rates of natural increase* in 20 Romanian counties. Its values were comprised between **0 and 2.0‰** in Hunedoara, Sibiu, Braşov and Harghita (Transylvania), Botoşani and Vrancea (Moldova), Tulcea and Constanța (Dobrudja), Dâmbovița and Argeş (Muntenia), Vâlcea and Gorj (Oltenia), with a minimum of 0.2‰, in Hunedoara and Vâlcea, then between **2.1 and 4.0‰** in Maramureş, Neamț and Galați and between **4.1 and 5.0‰** in Bistrița-Năsăud, Suceava, Iaşi, Bacău and Vaslui (fig. 2).

In the other 20 counties and Bucharest municipality, the rate of natural increase recorded *negative values*, between -0.3‰ (Alba County) and -5.4‰ (Arad County). Values comprised between **0 and -2.0‰** were recorded in the counties of Satu Mare (Maramureş), Sălaj, Cluj, Alba, Mureş and Covasna (Transylvania), Prahova, Buzău, Brăila, Ialomița and Călăraşi (Muntenia), Olt and Mehedinți (Oltenia). Values between **-2.1 and -4.0‰** were registered in Bucharest municipality and in Dolj, Caraş-Severin, Timiş and Bihor counties. Values between **-4.1 and -6.0‰** were recorded in Arad (-5.4‰), Teleorman (-5.1‰) and Giurgiu (-4.1‰). These highly negative values are caused either by the high proportion of elderly people or the high infant mortality rate.

2. 2. 2. The components of the natural growth of the Romanian population in 2002

These elements have continued to evolve in a negative direction as compared to 1992 (a birth rate of 11.4‰, a mortality rate of 11.6‰ and a natural increase rate of -0.2‰), so that in the year 2002, because of a birth rate of only 9.2‰ and a mortality rate of 12.4‰, the rate of natural increase recorded the highest negative value between 1992 and 2008, **-2.7‰**. Of course, comparing this national average rate to the birth rate, the mortality rate and the natural increase rate in the administrative units of Romania, one notices significant differences from one situation to another, as follows (tab. 3 and fig. 3).

Thus, the birth rate, with a national average of **9.7‰,** recorded the lowest values in Bucharest municipality **(7.6‰)**, Teleorman (7.7‰) and Cluj (8.0‰) counties, and the highest values in four of the eight counties of Moldova: Vaslui **(13.0‰)**, Botoşani, Iaşi (each with 12.9‰) and Suceava (12.2‰). Between the limits of the low birth rate values, recorded in three counties, and the high birth rate values, recorded in four counties, 23 of the Romanian counties registered values of the birth rate between 8.1-10.0**‰**, including most of the counties of Muntenia (Argeş, Brăila, Buzău, Dâmbovița, Giurgiu, Ilfov and Prahova). All five counties of Oltenia (Dolj, Gorj, Mehedinți, Olt and Vâlcea), the three counties of Banat (Arad, Caraş-Severin and Timiş), the two counties of Dobrudja (Constanța and Tulcea), while only four of the ten counties of Transylvania (Alba, Braşov, Hunedoara and Sibiu), and only two in Moldova (Galați and Vrancea) had such birth rate values. On the other hand, one may notice that the group of the counties, twelve in number, which recorded a birth rate between **10.1-12.0‰**, are present in Transylvania (Bistrița-Năsăud, Covasna, Harghita, Mureş and Sălaj), Crişana (Bihor), Maramureş (Maramureş and Satu Mare), Moldova (Bacău and Neamț) and Muntenia (Călăraşi and Ialomița).

The analysis of the second element of the natural growth of the population of Romania for the year 2002 – the mortality rate - highlights the fact that most of these values are grouped around the national average of **12.4‰.** In 17 of the counties of Romania the recorded values are between **10.1 and 12.0‰**: Bacău, Galați, Iaşi (10.4‰), Neamț, Suceava, Vrancea (Moldova), Bistrița-Năsăud, Braşov (10.3‰, the lowest value at national level), Covasna, Harghita, Sibiu (Transylvania), and also the municipality of Bucharest and the counties of Argeş, Gorj, Timiş, Maramureş and Constanța (10.6‰). 19 Romanian counties recorded values between **12.1 and 14.0‰**: Brăila, Buzău, Dâmbovița, Ialomița, Ilfov,

Prahova (Muntenia), Mehedinți, Vâlcea (Oltenia), Caraş-Severin (Banat), Bihor (Crişana), Satu Mare (Maramureş), Alba, Cluj, Hunedoara, Mureş, Sălaj (Transylvania), Botoşani, Vaslui (Moldova) and Tulcea (Dobrudja). Values of the mortality rate above 14.0‰ were recorded in Călăraşi (14.2‰), Arad (14.4‰), Dolj and Olt (each with 14.7‰), Giurgiu (16.3‰) and Teleorman (18.1‰, the highest value on national level). This situation is due to the infant mortality rate (in the counties of Teleorman, Giurgiu, Olt etc.) and to the high number of elderly people (Arad).

The rate of natural increase of the Romanian population, as a direct consequence of the evolution of the birth rate and the mortality rate, reached the lowest value of the analyzed period in the year 2002, when it recorded **-2.7‰**.

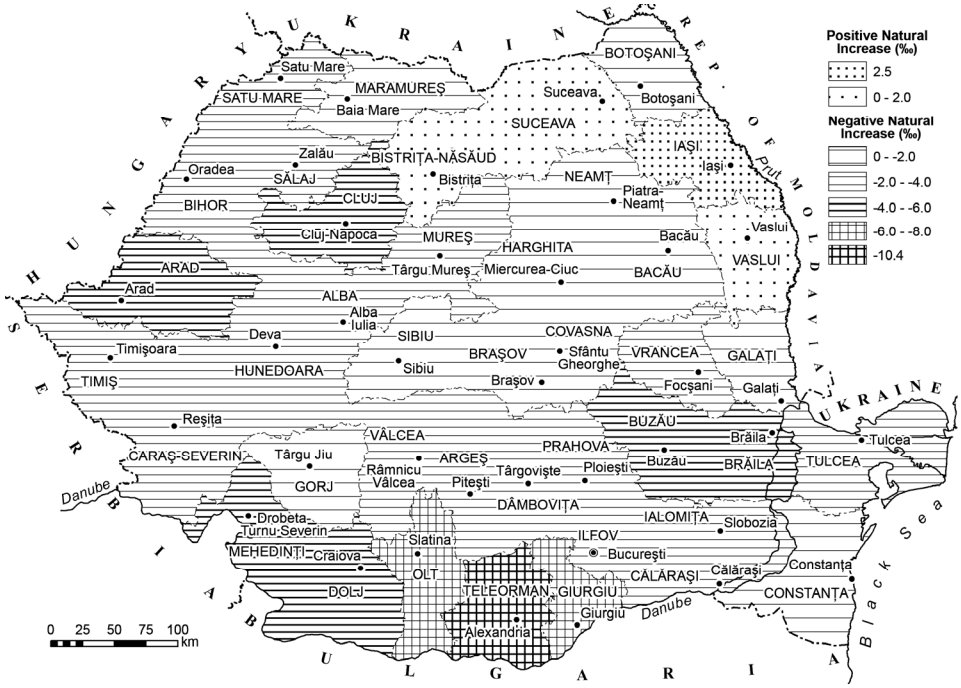


Fig. 3. The natural increase rate of the population of Romania, in 2002 (the names written in capital letters are counties, while those written in lower case are the corresponding county seats).

Compared to the mentioned national average, there are several different situations from one unit to another at the county level in the year 2002. First, one may notice that only four of the administrative units of Romania recorded a positive rate of natural increase: Bistriţa-Năsăud (0.2‰), Vaslui (0.9‰), Suceava (1.4‰) and Iaşi (2.5‰). All the others (38 in number) recorded negative values of the rate of natural increase of the population.

There are some specific characteristics regarding the ways in which the negative values of the natural increase rate are expressed in numbers and territory:

- in numbers, the values start from **-0.1‰** (Botoşani County), then -0.2‰ (Bistriţa-Năsăud), -0.5‰ (Bacău and Covasna) and -0.8‰ (Constanţa) The group of counties with values between **-1.0 and -2.0‰** includes Maramureş, Sibiu, Braşov, Harghita, Neamţ, Galaţi and Gorj. Afterwards, leaving apart the counties with values between *-2.1and -4.0‰* and between *-4.1 and -6.0‰*, the values reach -6.2‰ in Olt County and -7.4‰ in Giurgiu County. The lowest value was recorded in Teleorman County: **-10.4‰** (7.7‰ the birth rate and 18.1‰ the mortality rate);

- most of the Romanian counties (18 in all) recorded values between **-2.1- -4.0‰**. They may be found in all the geographical-historical provinces of Romania: in *Transylvania* (Alba, Hunedoara, Mureş, Sălaj), *Banat* (Caraş-Severin, Timiş), *Crişana* (Bihor), *Maramureş* (Satu Mare), *Moldova* (Vrancea), *Dobrudja* (Tulcea), *Muntenia* (Argeş, Călăraşi, Dâmbovița, Ialomița, Ilfov, Prahova and Bucharest municipality, the latter with a natural increase rate of -3.8‰) and Oltenia (Vâlcea);

- values of the rate of natural increase between **-4.1 and - 6.0‰** were recorded in only six of the Romanian counties, as following: Dolj (-5.9‰), Arad (-5.4‰), Mehedinți (-4.8‰), Cluj (-4.5‰), Buzău (-4.4‰) and Brăila (-4.1‰).

2. 2. 3. The components of the natural growth of the Romanian population in 2008

The comparison of the values of these elements with those of the previous years (1992, 1996 and 2002) indicates that in some cases, they are very similar or even equal, while in other cases there are quite obvious differences, especially concerning the rate of natural increase. Compared to the years 1996 and 2002, one may notice a certain „restoring" of the rate of natural increase in 2008. Onward, in a necessary synthesis for this situation, several aspects regarding the territorial distribution of the birth rate, the mortality rate and the rate of natural increase are shown, for the year 2008 (table 4).

The components of the natural growth of the population of Romania, in the years 1992, 1996, 2002 and 2008 (‰)

Table 4

Years	Birth rate	Mortality rate	Natural increase
1992	11.4	11.6	- 0.2
1996	10.2	12.7	- 2.5
2002	9.7	12.7	- 2.7
2008	10.3	11.8	- 1.5

Regarding the **birth rate**, one notices that nineteen of the Romanian counties recorded values between **8.1-10.0‰:** Alba, Cluj, Hunedoara (in Transylvania), Arad, Caraş-Severin (Banat), Galați, Neamț (Moldova), Tulcea (Dobrudja), Argeş, Brăila, Buzău, Dâmbovița, Giurgiu, Prahova (Muntenia), Dolj, Gorj, Mehedinți, Olt and Vâlcea (Oltenia). Other 19 counties recorded values between **10.1-12.0‰**. According to the geographical- historical provinces, they are: Bistrița-Năsăud, Braşov, Covasna, Harghita, Mureş, Sălaj and Sibiu; Timiş; Bihor (Crişana), Maramureş, Satu Mare (Maramureş); Bacău, Botoşani, Vaslui and Vrancea; Constanța; Călăraşi, Ialomița and Bucharest City (10.7‰). The lowest values of the birth rate are specific to Teleorman County, with only **7.7‰**, and the higher values of the birth rate were recorded in the counties of Iaşi **(12.8‰)**, Ilfov (12.3‰) and Suceava (12.1‰).

As for the **mortality** rate, it comes out that there is a quite obvious homogeneity at the level of administrative units. 22 of the Romanian counties have a mortality rate between **10.1 and 12.0‰**: Alba, Bistrița-Năsăud, Cluj, Covasna, Harghita, Mureş and Sibiu (Transylvania), Timiş (Banat), Maramureş (Maramureş), Bacău, Galați, Neamț, Suceava, Vaslui and Vrancea (Moldova), Constanța and Tulcea (Dobrudja), Argeş, Ilfov, Prahova, (Muntenia), Gorj and Vâlcea (Oltenia). Other 13 are comprised in the interval **12.1-14.0‰**: Hunedoara and Sălaj; Arad and Caraş-Severin; Bihor (Crişana), Satu Mare (Maramureş); Botoşani; Brăila, Buzău, Călăraşi and Ialomița; Dolj and Mehedinți. Below the analysed intervals, the lowest values of the mortality rate were recorded in the counties of Iaşi **(9.9‰)**, Braşov and Bucharest municipality (each with 10.0‰). Above these values, a mortality rate of more than 14.0‰ was registered in four of the counties of Muntenia: Olt (14.1‰), Dâmbovița and Giurgiu (each with 15.7‰) and Teleorman (**16.8‰)**. This situation is determined by the high infant mortality of these areas.

The rate of natural increase of the year 2008 **(-1.5‰)**, as it comes out from the data presented in tables 3 and 4, registered a visible revival compared to the one recorded in 2002 (-2.7‰). This situation is reflected in the values it had at the level of Romanian counties and there is an opportunity to highlight several specific aspects:

- in ten of the counties, there were rates of natural increase of **0.0‰** (Covasna and Harghita), of **0.1-1.2‰** in Bistrița-Năsăud, Braşov, Sibiu, Maramureş, Suceava, Constanța and Ilfov, while in Iași, where the rate was positive in all analysed years, it reached **2.9‰**;

- in 15 counties, the rate of natural increase had values between **-0.2 and -2.0‰**: Cluj, Mureş, Sălaj, Timiş, Bihor, Satu Mare, Bacău, Botoşani, Galați, Neamț, Vaslui, Vrancea, Bucharest municipality, Ialomița and Gorj, while in other ten between **-2.1 and -4.0‰**: Alba and Hunedoara, Arad and Caraş-Severin, Tulcea, Argeş, Buzău, Călăraşi and Prahova, and Vâlcea;

- a rate of natural increase below **-4.0‰** is specific to four counties of Muntenia: Brăila (-4.4‰), Dâmbovița (-5.7‰), Giurgiu (-5.7‰) and Teleorman **(-9.1‰**, the highest in all analysed years) and three of Oltenia: Olt (5.9‰), Dolj (-4.7‰) and Mehedinți (-5.2‰).

3. CONCLUSIONS

The analysis of the manner in which the components of the natural growth of the Romanian population evolved between 1989 and 2008 highlighted several significant features:

- at national level, starting with the liberalization of birth control (at the end of December 1989), *the birth rate* gradually decreased from 16.0‰ in 1989 to 11.4‰ in 1992, while *the mortality rate* increased from 10.7‰ to 11.6‰. The result of this evolution was the recording, for the first time in the geodemographic evolution of Romania, of a *negative rate of natural increase* of -0.2‰ in 1992, compared to 5.3‰ in 1989 (table 2);

- due to the corresponding values of the birth rate and mortality rate, *the rate of natural increase* reached values of -2.5‰ in 1996, then -2.7‰ in 2002 and -1.5‰ in 2008;

- compared to the situation of the natural growth of the population of Romania (birth rate, mortality rate and the rate of natural increase), considered to be level 1, at the next two levels, those of the geographical-historical provinces and the counties, there are significant differences from one case to another, that were detailed in the above analysis and stand out easily from the synthesis performed in table 3.

R E F E R E N C E S

1. Pop, Gr., Rusu Viorica (1969), *Unele aspecte privind populația oraşului Oradea*, Comunicări de Geografie, vol. VIII, Bucureşti.
1. Pop, P. Gr. (1972), România. Geografie Economică, Partea I-a, Inst. Pedagogic Oradea, Fac. de Istorie-Geografie, Oradea -1972.
2. Pop, Gr. (1974*)*, *Mobilitatea populației unui sat din Podişul Someşan. Satul Calna, județul Cluj,* Lucrări Științifice, Seria Geografie, Oradea.
3. Pop, Gr. (1975), *Unele aspecte cu privire la populația zonei deluroase Surduc-Dej,* Lucrări Științifice, Seria Geografie, Oradea.
4. Pop, P. Gr. (1986), *România. Geografie Economică, Partea I-a, Ediția a II-a*, Universitatea Cluj-Napoca, Facultatea de Biologie, Geografie şi Geologie.
5. Pop, P. Gr. (1998), *Model de involuție rurală. Satul Calna, județul Cluj,* Studia Universitatis Babeş-Bolyai, Geographia, 1, Cluj-Napoca.
6. xxx *Anuarele statistice ale României*, corresponding to the years analysed in this study.

STUDIA UBB GEOGRAPHIA, LVI, 2, 2011

THE POPULATION OF BRAN AREA VILLAGES AFTER 1990 AND SOME ASPECTS OF THE GEODEMOGRAPHIC RISK

A. NIȚĂ[1]

ABSTRACT. – The Population of Bran Area Villages after 1990 and Some Aspects of the Geodemographic Risk. The villages in Bran area developed close to Braşov city, in an intensely travelled Trans-Carpathian corridor, and for a long time they were situated at the border of two states and even empires. For all that, a reduced division of labour for long periods of time favoured their common evolution and the development of the same needs. In consequence, we may say that, from regional point of view, they outline the ethnographic mental space (P. Cocean, 2002, p. 58) of Bran area. The development in the same relief conditions led to similarities in social and economic characteristics, the sheepherding being the main occupation of their inhabitants. Even after that activity fell into decay, the newer ones (starting with the exploitation of the forest at the end of the 19th century and ending with the development of rural tourism in the last two decades) were also common activities, developed in all the villages, with a strong base in their ethnographic characteristics. Common activities led, first to similar typology of the components of settlements (patterns or built-up area, population and lands) and then, to strong connections, not only by administrative relations but by economic and demographic ones too. Those connections created a local settlement system (I. Ianoş, J. B. Humeau, 2000, p. 99) which by its traditional external relations is included in the regional settlement system of Braşov city. Administratively, the settlements are grouped in three communes. Downstream to upstream, they are: *Bran*, including the villages Bran (made up by the old villages Bran and Poarta), Şimon and the two villages from Sohodol Piedmont, Predeluț and Sohodol; *Moieciu*, with the villages Moieciu de Jos (the commune seat), Cheia, Drumul Carului, Măgura, Moieciu de Sus and Peştera; *Fundata*, with the villages Fundata, Fundățica and Şirnea.

Keywords: *Bran, corridor, birth rate, death rate, emigration, immigration, population decrease, population ageing, primary production, rural tourism, risk, median age, childbearing age, general fertility rate, population pyramid.*

1. INTRODUCTION

The Bran area villages are located in Bran Corridor (the North-East part of Bran – Rucăr – Dragoslavele Corridor, downstream the watershed) and in Sohodol Piedmont (South-West of Braşov Depression). The relief opens as an amphitheatre, descending from Giuvala Pass to Braşov Depression, and consists of two levels: one of the Bran Platform (corresponding to Gornoviţa levelling surface in Southern Carpathians) and Sohodol Piedmont, on whose smooth table lands the settlements have scattered households, and the other one, of the intense deepened valleys, where the settlements have a concentrated texture.

[1] *Babeş-Bolyai University, Faculty of Geography, University Extension Gheorgheni, Romania, e-mail: nitaadrian@hotmail.com.*

2. THE EVOLUTION OF THE NUMBER OF INHABITANTS BEFORE 1990

Like other areas at the edge of Braşov Depression (Gura Cheii – Râşnov and the depressions of Baraolt and Întorsura Buzăului), the oldest traces of habitation in the entire inner Carpathians Curvature were found in Bran Corridor. In The Big Cave and in The Small Cave from Peştera (The Cave) village, traces were discovered attesting the habitation even since the Middle Palaeolithic (about 30 000 years B.P.), by *Homo neanderthalensis*, and since the Upper Palaeolithic (about 25 000 – 10 000 years B.P.), by *Homo sapiens fossilis* (The Small Cave). Other findings from the same periods were examined by archaeologists in the cave of Valea Coacăzii (Currant Valley, in Şirnea village) and around Moieciu de Jos village (open air findings). In The Big Cave pottery was also found attesting the continuous habitation from Neolithic until the first culture of the Iron Age, Hallstatt, and even during the 3rd and 4th centuries A.D. (probably in those last times the cave represented a temporary refuge for the inhabitants of the village in vicinity).

The Bran – Rucăr – Dragoslavele Corridor is not only an ancient area of habitation, but one of intense Trans-Carpathian transit as well. The *Roman denarius* thesaurus (from 172/171 B.C. – 38 B.C.) discovered at Bran, on the road connecting the main town of the *Dacians* in Bârsa Land, *Cumidava* (today Râşnov), with the South of Europe, dates from the second culture of the Iron Age, La Tène. The small Roman military camp (*burgus* type) at Drumul Carului, located on the road that followed the Roman border (*Transalutanus limes*) between Râşnov and Jidova (today, Apa Sărată, Câmpulung town), dates since Roman times. Around this camp some findings were also unearth dating from Neolithic, in secondary position, Fl. Costea considering that they remained in the area during their transport towards South (2004, p. 22 – 23). At Poarta another newer monetary thesaurus was discovered dating from the 3rd and 4th centuries A.D. From those times also dates the ceramics discovered at Peştera.

During the migrations in the first millennium, the main event in Bran Area villages was the setting of the *Slavs*, in *colonies* close to *Romanian* settlements (in two waves, in the 6th and 7th to 8th centuries). At Bran, the process is at all sustained by the two toponyms, *Bran* and *Poarta*. For the northern Slavs, the term *bran* means *gate*. The Latin term *porta* (gate), from which derived the Romanian name Poarta, translated by the Slavs at their arrival, had also the sense *pass* or *gorge*. Finally, both names came from the pass before which the Romanian village and the Slavic colony developed. S. Puşcariu (1977) explained the preservation of the *Slavic* name by the responsiveness of Romanians to neologisms, preferring the most expressive term (p. 48), and by their wish to avoid ambiguity in spoken language (p. 52). The setting of an important Slav contingent in the area is proven by the presence of numerous other Slavic toponyms, among which the oiconyms *Sohodol, Predeluț* and *Peştera*.

At the beginning of the next millennium (the 13th century), *German* and *Hungarian* populations were colonised nearby. Such changes led also to the first written documents showing the settlements. Bran village is attested in 1367 as feudal possession. During the Middle Ages, it will evolve as a feudal possession or with parts under feudal institutions, such as Bran Castle (built up until 1377). The main economic activity was sheepherding (mainly *the double pendulant sheepherding* and lesser and for a shorter period, *the transhumant sheepherding* – N. Dunăre, 1972, p. 192); this activity preserved the village typology (village with scattered households, in the opinion of important ethnographers and geographers, like Romulus Vuia or Ion Conea, the ancient type of the Romanian village) and the architectural type of the household, resembling to a small wooden fortress ("*The shelters represent the primal type of the old-fashioned house, created here too from the need of weaning the animals as tight as possible to the man's housing*", N. Orghidan, 1929, p. 239).

Still, Bran Corridor keeps its role as the main communication gate towards the capital cities of Walachia, with the only wagon road crossing the Carpathians in this area, aspect reminded by the toponym *Drumul Carului* (The Wagon's Road). Its importance will diminish after the opening of the road on Timiş Valley, through Predeal Pass, and especially of the railroad there.

Since the end of the 18th century date the first high scale cartographic documents representing the villages in Bran Corridor; there all the villages of today were present, with their households scattered on the smooth table lands as well as in the valleys. The first registrations of the number of inhabitants also date since then, though truly modern censuses were performed starting since 1850 only (table 1).

In the first part of the analysed interval (table 1), until the beginning of the 20th century, the area of Bran villages was in a full economic reorganization process. On the one hand, the inhabitants quit sheepherding as main activity (because of extension of arable land in Romania and Transylvanian Depression) and on the other, they opted for local industries which depended on wood exploiting, primary processing and transporting. These activities took high proportions between the two world wars. But since then, a part of the population was attracted, by commuting, towards other industries, especially from Braşov City and Bârsa Land. During the socialist industrialization, part of the active population sets in the close industrial settlements, mainly in Braşov City. Still, a high natural increase rate supported the growth of the number of inhabitants. By the end of the communist regime, the birth rate reduced and because of the reduction of some forest activities too, there was a migration process towards the near industrial areas. This finally led, for the first time in the analysed interval, to the decrease of the number of inhabitants.

The Evolution of the Number of Inhabitants In Bran Communes

Table 1

Year	Bran	Moieciu	Fundata	Total
1850	3 896	3 403	1 629	8 928
1910	4 132	3 985	1 720	9 837
1930	4 737	4 347	1 984	11 068
1966	5 511	5 384	1 903	12 798
1977	6 029	5 763	1 775	13 567
1992	5 692	5 171	1 324	12 187
2002	5 292	4 784	1 008	11 084

3. THE EVOLUTION OF THE NUMBER OF INHABITANTS AFTER 1990

In 1991, in two of the three communes, Bran and Moieciu, there was a growth of the number of inhabitants; on the background of the new economic and social conditions, a part of the previously left people resettled there. After 1991, the number of inhabitants follows a downward trend, with small periods of returning in the case of Bran commune. In this last interval, the population decreased by 12.5%, the process being as intense as the villages composing the communes are more isolated and distant from the main city in the area, Braşov City (Bran, -7.5 %, Moieciu, -11.8 %, Fundata, -36.5 %).

3. 1. The natural growth

From this point of view, every one of the three communes had a different evolution. The most negative situation is found in *Fundata* commune where, because of its isolation and intense population ageing, the differences between birth rates and death rates were very high, in favour of the second ones since 1991. On average, for the interval starting in 1990, the birth rate value was 6.1 ‰, and the death rate one, 18.2 ‰.

Bran Communes Population Movement, Between 1990 and 2008 (‰)

Table 2

Population's characteristics		1990	1991	1992	1994	1996	1998	2000	2002	2004	2006	2008
Bran Commune	Number of inhabitants	5637	5727	5700	5669	5632	5656	5598	5363	5353	5326	5299
	Birth Rate	11.4	13.3	9.5	7.6	7.8	9.4	6.6	7,1	9.9	8.3	7.9
	Death Rate	11.7	12.8	12.6	12.7	12.1	10.8	11.8	11,8	14	13	14.9
	Infant Mortality Rate	15.6	13.2	0	0	22.7	0	27	26,3	0	0	23.8
	Natural Increase Rate	-0.4	0.5	-3.2	-5.1	-4.3	-1.4	-5.2	-4,7	-4.1	-4.7	-7
	Immigration Rate	4.6	4.7	11.6	10.8	13	11.9	12.9	10,8	12.1	16.3	17.4
	Emigration Rate	25.7	10.3	11.1	10.1	11.4	11.1	9.8	13,6	11	12.8	13.2
	Migratory Growth Rate	-21.1	-5.6	0.5	0.7	1.6	0.7	3	-2,8	1.1	3.6	4.2
	Population Growth Rate	-21.5	-5.1	-2.6	-4.4	-2.7	-0.7	-2.1	-7,5	-3	-1.1	-2.9
Moieciu Commune	Number of inhabitants	5278	5313	5161	5106	5019	4962	4864	4802	4767	4688	4684
	Birth Rate	15.9	12.1	16.5	14.3	9.6	11.3	11.9	10,8	8.8	10	8.5
	Death Rate	10.2	11.3	9.3	8.8	12.8	7.7	9.7	16,7	11.5	9.2	12.2
	Infant Mortality Rate	0	15.6	0	13.7	41.7	17.4	17.2	0	0	42.6	0
	Natural Increase Rate	5.7	0.8	7.2	5.5	-3.2	3.6	2.3	-5,8	-2.7	0.9	-3.6
	Immigration Rate	4	3.4	9.3	13	8.6	7.7	2.7	11,9	9.9	13.9	12
	Emigration Rate	43.2	17.9	24.6	18	16.1	17.3	14.4	17,1	18.9	17.3	14.5
	Migratory Growth Rate	-39.2	-14.5	-15.3	-5.1	-7.6	-9.7	-11.7	-5,2	-9	-3.4	-2.3
	Population Growth Rate	-33.5	-13.7	-8.1	0.4	-10.8	-6	-9.5	-11	-11.7	-2.6	-6.2

Table 2 ***(continued)***

		1990	1991	1992	1994	1996	1998	2000	2002	2004	2006	2008
Fundata Commune	Number of inhabitants	1363	1338	1301	1218	1137	1042	1002	1010	948	884	850
	Birth Rate	13.2	7.5	6.2	4.9	4.4	4.8	6	3	5.3	5.7	5.9
	Death Rate	12.5	16.4	13.1	14.8	22	21.1	16	12.9	12.7	14.7	20
	Infant Mortality Rate	0	0	0	0	0	0	0	0	0	0	0
	Natural Increase Rate	0.7	-9	-6.9	-9.9	-17.6	-16.3	-10	-9.9	-7.4	-9.1	-14.1
	Immigration Rate	0	0.8	2.3	0.8	7	4.8	18	8.9	14.8	12.4	14.1
	Emigration Rate	72.6	38.1	24.6	33.7	28.1	21.1	10	34.7	27.4	18.1	25.9
	Migratory Growth Rate	-72.6	-37.4	-22.3	-32.8	-21.1	-16.3	-8	-25.7	-12.7	-5.7	-11.8
	Population Growth Rate	-71.9	-46.3	-29.2	-42.7	-38.7	-32.6	-2	-35.6	-20	-14.7	-25.9
Total	Number of inhabitants	12278	12378	12162	11993	11788	11660	11464	11175	11068	10898	10833
	Birth Rate	13.5	12.1	12.1	10.2	8.2	9.8	8.8	8.3	9	8.8	8
	Death Rate	11.2	12.5	11.3	11.3	13.3	10.4	11.3	14	12.8	11.5	14.1
	Infant Mortality Rate	6	13.3	0	8.2	30.9	8.8	19.8	10.8	0	20.8	11.5
	Natural Increase Rate	2.4	-0.4	0.8	-1.1	-5.1	-0.6	-2.4	-5.6	-3.8	-2.7	-6.1
	Immigration Rate	3.8	3.7	9.6	10.7	10.5	9.4	9	11.1	11.4	15	14.8
	Emigration Rate	38.4	16.6	18.3	15.8	15	14.7	11.8	17	15.8	15.1	14.8
	Migratory Growth Rate	-34.6	-12.9	-8.6	-5.1	-4.5	-5.2	-2.8	-5.9	-4.4	-0.2	0
	Population Growth Rate	-32.3	-13.3	-7.8	-6.3	-9.6	-5.8	-5.2	-11.5	-8.2	-2.8	-6.1

From D.J.S. Braşov (the 1st of July values)

In *Bran* commune too one can find a birth rate lower than the death rate (except 1991) but, unlike the case of Fundata commune, here the situation was generated not as much by the population ageing, as by its behaviour closer to the urban one. This behaviour is the result of intense development of third economic activities sector and has low values of birth rate and medium values of death rate. For the whole analysed period, the birth rate value was 8.7 ‰, and the death rate one, 12.2 ‰.

Although with a small advance for the death rate, in *Moieciu* commune the values of the two indicators were the closest: birth rate average value was 11 ‰, and the death rate one, 11.3 ‰. The situation was the effect of a higher stability of population, closer to the archaic living than the one in the commune downstream; here the tourism and other tertiary activities developed later (A. Niță, 2009). The natural increase rate was positive between 1990 and 1993 and in 1998, 2000 and 2006.

Summing all the communes, the death rates registered constant values, without spectacular growths. For the birth rates, one can see a decreasing trend, still more intense until the half of the first decade, times with important social and economic changes in the whole country. For the entire interval, the natural increase rate was positive in 1990 and 1992 only; otherwise, it oscillated around the medium value, -2.9 ‰.

3. 2. The migration rate

In terms of migration rate, the three communes recorded significant differences too. Once again, *Fundata* commune registered the most negative values, with the highest emigration rate. Also, one can find a constant immigration rate growth, in 2000 and 2007 the migratory growth rate being even positive. The situation can be explained by that in the last years the commune became an important target for those who built up family or holiday houses and retired here at the end of their economic activity. For the whole period, the emigration rate was 30.3 ‰ and the immigration one, 7 ‰.

The migratory growth rate was negative in *Moieciu* commune too, though with lower values: medium emigration rate, 17.9 ‰, medium immigration rate, 9 ‰. Still, in this case too one can find, along the interval, a decrease of emigration rate while the immigration rate remained around the average, to the end the two indicators approaching.

In *Bran* commune, though the migratory growth was slightly negative in average (resulted from an average emigration rate of 11.9 ‰ and an average immigration rate of 11.3 ‰), one can find that for the most of the interval (1992 and the periods 1994 – 1998, 2000 – 2001 and 2004 – 2008) it was positive. The negative value of the average was because of the massive emigration in 1990, in the newer social and economic conditions, phenomena recorded in all the communes in Bârsa Land (A. Niță, 2007).

As a sum, in Bran communes the migratory growth rate was negative, resulted from a medium immigration rate of 9.9 ‰ and a medium emigration rate of 16.2 ‰. Still, after 1992 the emigration rate oscillated around the average, in the last five years maintaining under it, while the immigration rate had an upward trend.

3. 3. The population growth

On the whole, the population decreased in Bran area communes. The natural increase rate registered a downward trend, more intense in Bran commune and less intense in Moieciu commune. But the migratory growth rate had, generally, an upward trend, which made it positive or zero in the last two years of the interval. Totalizing the two, one can find

that, although the population growth rate became positive in two years only and only in Bran commune (2001 and 2007), since 2002 it had an upward trend, supported by the growing of migratory growth rate in all the communes and of the natural increase rate in Moieciu.

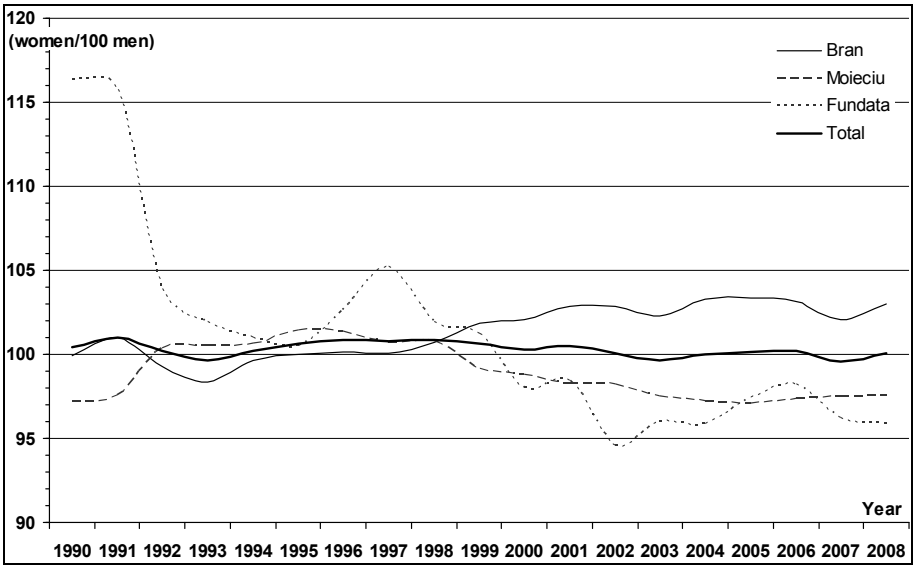
By villages, based on 1992 and 2002 censuses, the highest decreases took place in the isolated villages, especially from Fundata commune, and in the small villages (Şirnea, -31.8 %, Fundăţica, -21.8 %, Fundata, -21.8 %, Drumul Carului, -22.5 %, Peştera, -17.3 %, Măgura, -13 %), but in Bran village too, -12.2 %. The only village registering a positive growth was Predeluţ, by one inhabitant (0.1 %).

4. CHANGES IN THE STRUCTURES OF POPULATION

Considering the high weight of Romanian and Christian-Orthodox population in Bran area villages, the population evolution described above produced major changes especially in gender and age structures, and in the weight and the structure of active population.

4. 1. The gender structure

Summing all Bran Communes, for the entire interval the femininity index remained around the equilibrium value, with an average of 100.3 women/100 men. Still, the index had a different evolution for every one of the three communes (fig. 1).



From DJS Braşov. The 1 of July values.

Fig. 1. The evolution of femininity index in Bran Communes, after 1990.

The highest values were registered at the beginning of the 1990s, in *Fundata* commune (116.4 in 1990), because of its isolation. The remoteness led to high emigration rates (men having a higher mobility than women), to high weights of population working in primary production

and, finally, to population ageing (women having a higher proportion in the elderly category). After that period, because of the immigration phenomena growth, the femininity index values decreased to the lowest in all the three communes: 94.6 in 2002 and 95.9 in 2008.

In *Bran* commune, contrarily, the femininity index increased, but the phenomenon had not the proportions of the one in the previous commune. The small increase is the result of birth rates decreasing (the number of new born boys is higher than the one of the girls) and of positive emigration rate (men have a higher mobility). Bran commune bounds for activities of third economic sector, mostly women specific.

In *Moieciu* commune the femininity index evolved directly linked to the population movement too. Thus, in the first year after 1990, when the birth rate was high, the femininity index was below 100, though the emigration also had high values (as well as in the other communes). Then, when the emigration stabilized at a high value and the birth rate decreased, the index value surpassed 100. Once the immigration and emigration rates approached, the femininity index fell below 100 again.

Though the femininity index evolution was different for every commune, one can say that, generally, the increasing immigration rate led to increases of the weight of men, less in Bran commune, with higher weight of tertiary economic activities.

At the village level, based on the 2002 census data, the highest values of femininity index were in the villages composing Bran commune, with high share of population active in tertiary economic activities (the commune has also one of the highest rates of university and post-secondary school graduates in the rural of Braşov County, the third after the communes in close vicinity of Braşov city, Cristian and Sânpetru). High weights of women are also found in the other two commune centres.

4. 2. The age structure

Between the last two censuses, in all the villages of Bran area the weight of the *young* decreased, and the one of the elderly increased (table 3), mostly because of the decrease of birth rate. The most important decreases of the young were registered either in the isolated villages, with important weight of elders (in Fundățica it reduced by 16 pp, namely by 101.2 %), either the villages affected by emigration (in Cheia, the weight of the young reduced by 10 pp, namely, by 42.5 %). Significant decreases experienced other villages too, especially of Moieciu commune, even if the birth rate was higher there, on the background of intense increase of the elderly.

Important growths of the weight of the *elderly* were registered especially in the isolated villages (Fundata, 51.1 %, Fundățica, 30.8 %, therefore, the population set there by migration is mostly elderly too), the small villages (Drumul Carului, 34.7 %), but also the commune seats, which were more attractive for those retired there (considering their urban equipment) and where the birth rate lowered more due to urban population behaviour (Bran, 40.4 %, Moieciu de Jos, 43.3 %). Small growths of the elderly took place in Predeluț and Peștera villages, not because of a low decrease of the young, but of an intense growth of the mature.

Decreases of the *adults* took place in Bran (-6.4 %) and Fundata (-3.2 %) commune centres, because of the emigration; the population in these villages is better trained and, as a consequence, has a higher mobility. In Moieciu de Jos the weight slightly increased, by 1.3 %.

As a sum, for all Bran area villages, the weight of the young reduced by 6.2 pp, namely, by 28 %, the one of the mature increased by 1.2 pp, namely, by 2.2 % and the one of the elderly increased by 5 pp, namely by 24.5 %.

The Age Categories Structure, in Bran Villages, in 1992 and 2002 (%)

Table 3

Village/ Commune	1992				2002			
	Total	Young	Mature	Elderly	Total	Young	Mature	Elderly
Bran	1637	24.5	55.3	20.2	1438	19.7	52	28.3
Predeluţ	918	28.1	51.6	20.3	919	22.9	54.6	22.5
Şimon	1312	29.3	52.3	18.4	1238	22.8	54.4	22.8
Sohodol	1825	25.6	52.6	21.8	1697	20.6	53.2	26.2
BRAN	5692	26.5	53.2	20.3	5292	21.3	53.4	25.3
Moieciu de Jos	2136	30.1	54.4	15.6	2082	22.6	55	22.3
Cheia	530	33.4	46.6	20	482	23.4	52.1	24.5
Drumul Carului	169	25.4	47.9	26.6	131	18.3	45.8	35.9
Măgura	691	31.7	46.9	21.4	601	26.1	47.9	26
Moieciu de Sus	963	33.5	48.6	17.9	924	25.8	52.2	22.1
Peştera	682	31.5	45.6	22.9	564	26.4	48.4	25.2
MOIECIU	5171	31.3	50.1	18.6	4784	24.1	52.3	23.7
Fundata	642	25.4	48.4	26.2	526	18.8	47	34.2
Fundăţica	170	31.8	42.4	25.9	133	15.8	45.1	39.1
Şirnea	512	21.1	42.6	36.3	349	16.6	43	40.4
FUNDATA	1324	24.5	45.4	30.1	1008	17.7	45.3	37
TOTAL	12187	28.3	51	20.6	11084	22.1	52.2	25.7

4. 3. The professional structure

Between the last two censuses, decreasing the weight of the young and increasing the tuition period made the weight of active population in the total of population to decrease too, from 41.2 % in 1992 to 40.3 %, namely, by 2.2 %. By communes, a decrease of active population was registered by the ones where the weight of the mature remained about the same (with variations below 1 %), namely, Bran (44.1 % in 1992 and 40.4 % in 2002) and Fundata (35.4 % in 1992 and 29.6 in 2002). One can see the very low weight of active population in Fundata commune, below 30 %, because of the population ageing process developed there. In Moieciu commune, where the weight of the mature increased, it also increased the weight of active population (39.5 % in 1992 and 42.4 % in 2002).

Mainly because of economic changes, after 1990 the weight of the employment rate (occupation rate of population) in the active population dropped down, from 96 % in 1992, to 75.9 % in 2002. By communes, the decrease was as high as the number of active persons was higher: Bran, from 96.3 % to 73.4 %, Moieciu, from 95.4 % to 77.1 %, Fundata, from 97.2 % to 85.6 %. As real value, in 2002 the most of the unemployed were in Bran and Moieciu communes, 568, respectively, 464, and the less, in Fundata commune, 43.

By economic activities, between the last two censuses, in Bran area villages the weight of the population working in primary production (agriculture, forestry, hunting and fishing) increased by 74 %, the one of workers in secondary economic activity (industry and constructions) decreased by 41.9 % and the one of workers in tertiary economic activity (services) increased by 38.2 %.

The most important growths of the population working in primary production (fig. 2) took place in Moieciu commune (158.4 %), especially in the isolated villages (Măgura, 356.4 %, Moieciu de Sus, 132.3 %, Peştera, 76.4 %) and in the small villages (Drumul Carului, 166.7 %), as well as in the most isolated of all villages in the area, Fundățica (147.7 %). The causes are, on the one hand the reorganization of industry in Bârsa Land, on the other, the isolation of these settlements and the long distance to the main road in the area, National Road 73 (Braşov – Piteşti). Decreases took place in Fundata commune centre (-31.1 %) and in Cheia village, located very close to the administrative centre of Moieciu commune (-18.2 %).

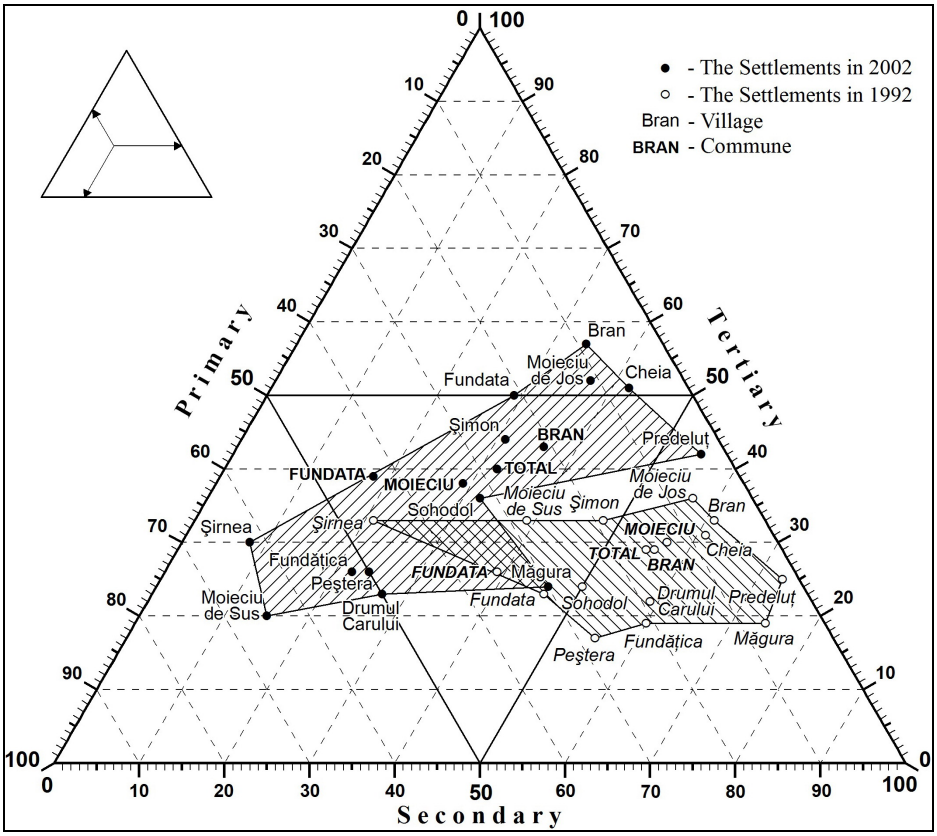


Fig. 2. The structure of population in Bran Villages, on main economic activities, in 1992 and 2002.

Consequence of changes in the industry in Bârsa Land, the weight of population working in secondary production decreased in all the villages in Bran area (fig. 2). The most important decreases took place in the isolated villages, were the industry employees depended on the commuting, considering that Bran Villages are not and were not industrialized (Fundățica, -63.2 %, Şirnea, -61.7 %, Peştera, -56.3 %), but also in Bran commune centre, where, due to its higher training, the population oriented towards tertiary activity. Small decreases took place in the other two commune centres and in the villages in Bârsa Depression.

As about the population working in tertiary economic sector, its weight grew in all Bran villages, except for the isolated villages Moieciu de Sus (-37.3 %), with important increase of population working in primary production, and Şirnea (-8.7 %). High growths of the weight took place in commune centre villages (Fundata, 123.6 %, Bran, 71 %, Moieciu de Jos, 45.7 %), in the villages positioned in their vicinity (Predeluț, 69 %, Cheia, 66.6 %, Sohodol, 48.7 %) and in those villages that developed commerce and tourism activities (Peştera, 56.1 %). As real value, it decreased the number of those working in transports and telecommunications (-38.8 %) and it grew the number of the employees in public administration (by 81.3 %). The number of commerce and tourism workers remained the same and of those in education and health grew with maximum 5 persons, namely, about 3 % more than in 1992.

4. 4. The ethnic and confessional structures

The high weight of Romanians in Bran villages made the census changes in ethnic and confessional structures to be insignificant. In average, both in 1992 and 2002 Romanians represented 99.8 %. Though, if in 1992 nine villages (three outlined in a commune) were 100 % Romanians (Şimon, Sohodol, Drumul Carului, Măgura, Moieciu de Sus, Peştera, Fundata, Fundățica and Şirnea), in 2002, as a result of migratory movement, only four small or isolated villages were still in that situation (Cheia, Drumul Carului, Peştera and Fundățica).

The other nationalities inhabit the big villages, especially the commune centres Bran and Moieciu de Jos, and some villages situated in close vicinity. Between the last two censuses, the number of Hungarians dropped from 15 to 9 (of which, a person self-declared Szekler), this time being met in two of the villages of Fundata commune too; the number of Germans remained constant, 4, but also, if in 1992 they were present only in Bran and Predeluț villages, in 2002 they were registered in Predeluț, Sohodol, Măgura and Moieciu de Sus, all small or isolated villages. The number of those in other ethnicity category, unnamed in the census, increased from 1 to 4, in 2002 being present in Bran village only.

The high weight of Romanians also determines the high weight of Christian-Orthodox, namely, 98.1 % in 1992 and 98.2 % in 2002. In 1992 five villages (once again, three outlining a commune) were 100 % Christian-Orthodox (Cheia, Drumul Carului, Fundata, Fundățica and Şirnea) and in 2002, three only (Cheia, Drumul Carului and Fundata). In 1992 four Greek-Catholics inhabited three of the villages in Bran commune, but in 2002 there were no such followers.

The next as weight in Bran villages is The Seventh-day Adventist Cult, sharing 1.4% both in 1992 and 2002. In 1992, 94.9 % of the followers were living in Bran commune (71 in Sohodol village, 64 in Bran, 30 in Predeluț and 1 in Şimon) and the others, in Moieciu commune (8 in Moieciu de Jos and 1 in Peştera). In 2002, among the 151 followers, 58 were living in Bran village, 51 in Sohodol, 33 in Predeluț, 2 in Şimon and 7 in Moieciu de Jos.

In turn there is another neo-Protestant denomination, The Evangelical Christians, which grew from 35 followers in 1992 to 38 in 2002; by villages, in 2002 18 followers were living in Sohodol, 13 in Măgura, 5 in Predeluț and one each in Şimon and Peştera.

The number of the followers of religions specific to Hungarians and Germans also increased. In 2002 there were six Roman-Catholics, compared to two in 1992, four Reformed, compared to two and, decreasing, one follower of The Romanian Evangelic Augustan Confession Church, compared to two.

5. THE DEMOGRAPHIC RISK

The major demographic risk in Bran Villages is the *population ageing*. But it is to be mentioned that this phenomenon is directly linked to *population fertility* and *population migratory movement*.

The degree of population ageing is well represented by the weight of the elderly in the total population and by the median age of population. Between the last two censuses, the share of the elderly in Bran Villages increased from 20.6 % in 1992 to 25.7 % in 2002, surpassing the weight of the young (28.3 % in 1992 and 22.1 in 2002). Besides, the increasing weight of the elderly is directly linked to the decreasing of the young, namely, to the lowering of birth rates.

The median age of population indicates a high degree of population ageing too. According to 2002 census, in Bran Villages the median age was 40.4 (39.2 for men and 41.6 for women). In the same year, the median age in the rural of Braşov County was 36.1 (34.8 and 37.4) and in the total of Romania, 37.3 (35.9 and 38.6).

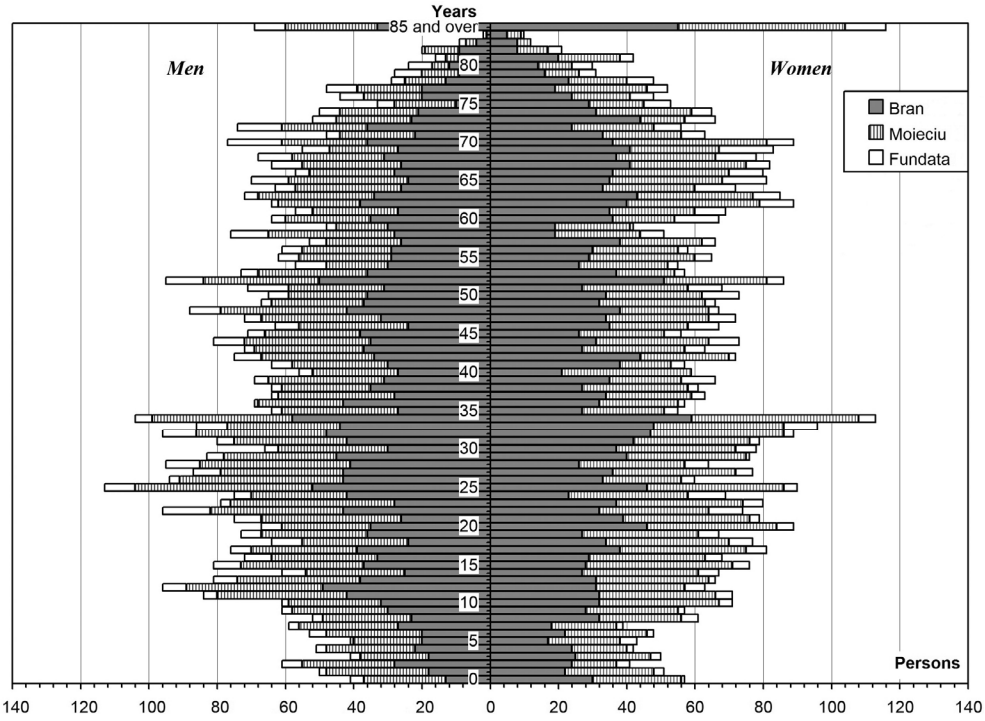


Fig. 3. The Bran Communes population pyramid, in 2002.

If representing the population ageing degree by reporting the extreme age main categories (elderly/young), between the last two censuses the situation has worsened. The resulting value was 0.73 in 1992 and 1.16 in 2002, both over the population ageing threshold value, 0.42 (L. Nicoară, 2004, p. 194).

Though as weight the elderly increased by 24.5 %, in numbers the increase was by 13 % only. Therefore, in Bran villages, and nationally too, much of the population ageing is because of the changing of population behaviour regarding the natality, because of infant mortality, plus a certain inertia ageing (T. Rotariu, 2004) caused by the passing of some population expanding cohorts in the older groups of population pyramid (fig. 3).

In average, for all the villages of Bran area, the birth rate has had an almost continuous decrease since 1990. At the same time, the infant mortality had an increasing trend until 1999 and then it decreased (table 2). Between the census years, the number of women at childbearing age (15 – 49 years old) dropped by 15.9 %. The consequence was the decrease of general fertility rate from 16.1 ‰ in 1992 to 12.1 ‰ in 2002.

The population structure in Bran Villages was also affected by a high emigration rate, especially in the first three years of the interval, and then to stabilize around the average. The immigration rate increased almost constantly. The high immigration rate may lead to stopping the population ageing process. Its high values in Fundata commune might mean that the newcomers are also in the elderly group, retired in this area at the end of their economic activity period. But the increasing of immigration rate may lead to the possibility of "local culture dissolution" (T. Rotariu, 2004, p. 181), a fact as serious as the villages created a tourism brand based on ethnographic values.

Not least, the high weight of elderly is also a consequence of the passage of some numerous population cohorts in the upper part of population pyramid (fig. 3). It can be seen that in 2002 the high weight of the elderly was represented by the population expanding "wave" of the 1930s. It will follow another one corresponding to population expanding at the end of World War II and then, a larger one, following the abortion banning at the end of 1960s. The population expanding periods are separate by low birth rate ones. The longest is the one of post 1990 newborns, times when the pyramid got a narrow basis, as well as all over Romania. On this line, it is necessary to resort to a birth encouraging policy, in order to reduce the dependence rate for the future.

6. CONCLUSIONS

Bran settlements work as a local settlement system, with strong social and economic relations, positioned in the high influence area of Braşov City. In terms of demographics, one can find differences among the villages, depending on their position in relation to the main city. The population growth is influenced by an urban behaviour as the communes are closer to the city (for example, Bran commune) and affected by population ageing as they are further away (Fundata). Concerning population structures, the change is as negative as the villages are more isolated or smaller, the main aspects being about the population ageing and the high weight of population working in primary production. Also, one can find differences between the settlements with commune centre function, with higher migratory movement (the emigration is encouraged by a better training of their inhabitants, the immigration, by a higher attraction due to their urban facilities), and the small and isolated villages, with more stable population but intensely affected by population ageing (because of the decreased birth rate and lack of alternative to agricultural and pastoral livelihood).

R E F E R E N C E S

1. Benedek, J., Schulz, E. (2003), *Riscurile în contextul tranziției demografice şi epidemiologice*, în „Riscuri şi catastrofe", vol II, Edit. Casa Cărții de Știință, Cluj-Napoca.
2. Colectiv (1972), *Țara Bârsei*, Edit. Academiei Republicii Socialiste România, Bucureşti (sub redacția lui M. Dunăre).
3. Conea, I. (1993), *Vrancea. Geografie istorică, toponimie şi terminologie geografică*, Edit. Academiei, Bucureşti.
4. Costea, Fl. (2002), *Dacii din sud-estul Transilvaniei înaintea şi în timpul stăpânirii romane*, Edit. C2Design, Braşov.
5. Costea, Fl. (2004), *Repertoriul arheologic al Județului Braşov*, Edit. C2Design, Braşov.
6. Halmaghi, I. (2001), *Prejmerul medieval*, Edit. Lux Libris, Braşov.
7. Horedt, K. (1947), *O contribuție preistorică la păşunatul în Carpații Sudici*, Revista istorică română, Bucureşti.
8. Ianoş, I., Humeau, J. B. (2000), *Teoria sistemelor de aşezări umane*, Edit. Tehnică, Bucureşti.
9. Nicoară, L. (2004), *Mutații structurale ale populației pe grupe de vârstă şi riscurile asociate*, în „Riscuri şi catastrofe", vol III, Edit. Casa Cărții de Știință, Cluj-Napoca.
10. Niță, A. (2007), *Aspecte privind mişcarea populației din Depresiunea Braşov, după anul 1990*, Studia Universitatis Babeş-Bolyai, Geographia, LII, 2, Cluj-Napoca.
11. Niță, A. (2007), *Populația şi aşezările din Depresiunea Braşov*, Teză de doctorat, Universitatea Babeş-Bolyai, Facultatea de Geografie, Catedra de Geografie Umană, Cluj-Napoca.
12. Niță, A. (2009), *Some Aspects Regarding the Influence of Tourism in the Bran Area's Settlements Patterns*, în volumul Conferinței Internaționale „The Role of Tourism in Territorial Development", Edit F&F International, Gheorgheni.
13. Orghidan, N. (1929), *Regiunea Braşovului. Considerațiuni asupra reliefului*, Țara Bârsei, V, Braşov.
14. Pop, Gr. (2000), *Carpații şi Subcarpații României*, Edit. Presa Universitară Clujeană, Cluj-Napoca.
15. Puşcariu, S. (1977), *Braşovul de altădată*, Edit. Dacia, Cluj-Napoca.
16. Surd, V. (1993), *Introducere în geografia spațiului rural*, Edit. Interferențe, Cluj Napoca.
17. Surd, V., Zotic, V., Puiu, V., Moldovan, C. (2007), *Riscul demografic în Munții Apuseni*, Edit. Presa Universitară Clujeană, Cluj-Napoca.
18. Rotariu, T. (2004), *Riscuri demografice*, în „Riscuri şi catastrofe", vol I, Edit. Casa Cărții de Știință, Cluj-Napoca.
19. Salvan, Fl., Costea, Fl (1999), *Civilizație şi continuitate românească în Țara Bârsei (din cele mai vechi timpuri, până spre amurgul Evului Mediu timpuriu)*, Edit. Orientul Latin, Braşov.
20. Salvan, Fl. (1996), *Viața satelor din Țara Bârsei în Evul Mediu (secolele XIII – XVII)*, Edit. Academiei Române, Bucureşti.
21. Vuia, R. (1964), *Tipuri de păstorit la români (sec XIX – începutul sec. XX)*, Edit. Academiei, Bucureşti.

STUDIA UBB GEOGRAPHIA, LVI, 2, 2011

GEODEMOGRAPHICAL RESOURCES IN THE SUBURBAN AREA OF CLUJ-NAPOCA

DÁNÉL ERIKA[1]

ABSTRACT. – Geodemographical Resources in the Suburban Area of Cluj-Napoca. Geodemographical resources offer a complex image over the evolution of the human factor and its dynamic. Their analyses are extremely important from the point of view of settlements. In the case of Cluj-Napoca and its suburban area the population represents one of the major factors of territorial changes. In the simplified way suburbanization signifies the migration of the population and the economical factors from the centre of the city towards the periphery and the surrounding villages. Suburban villages maintain strong and daily relations with the urban centre. The suburban area of Cluj-Napoca is represented by a more extended area, the Cluj-Napoca Metropolitan Area, which was delimited by the County Council and the local councils. In the complete analyses of the suburban processes and phenomenons geodemographical resources have a vital role. Population dynamics and its structure present interesting values in different periods of time. In analyzing these structures I used statistical data offered by the National Statistical Institute and other sources.

Keywords: *Metropolitan Area, suburbanization, geodemographical resources, population structure.*

1. INTRODUCTION

In the complete analyses of human settlements, geodemographical resources and their analyses have a vital role, which offers an image over the evolution of the human factor, the dynamics of the population and its structure in different categories.

Suburban areas are as old as the cities themselves, but the specific emigrational processes appear only in the XXth century, which automatically supposes its investigation in a more complex manner. The phenomenon constitutes a migration from the centre of the city towards the periphery and the surrounding villages. But the meaning of the phenomenon cannot be reduced to a single process. The notion of the phenomenon involves the bilateral influences from the city towards the surrounding villages and vice versa, having at the same time a sociological connotation, by which we can analyze the inner motivation of the population participating in the process.

2. SOME THEORETICAL APPROACHES TO SUBURBANIZATION

The Dictionary of Human Geography, edited by Godall B. in 1987, defines the suburban area as the exterior residential zone of a city in continuous extension. From a social point of view suburbia is a homogeneous district inside the territory. The notion signifies low density of the population and a specific way of life.

[1] *Babeş-Bolyai University, Faculty of Geography, 400006, Cluj-Napoca, Romania e-mail: erika.danel@geografie.ubbcluj.ro*

According to the dictionary there is a difference between the close influential sphere (Umland) and the distant influential sphere (Hinterland). The Umland means the influence of the city over the close surrounding areas, where the dependence level is bilateral.

In the Romanian literature Sârbu C. N. creates a collection of terms referring to the periphery of the city in his work entitled "Habitatul urban în expansiune periurbană" (Urban habitat in periurban expansion, 2005). According to this collection the suburban area delimits the territory belonging to the city. In the concrete case of Romania suburban areas are rural settlements in the city's neighborhood that develop a strong interdependence with the center. Suburban areas also can signify the growth of the urban areas towards the periphery, especially by the appearance of some residential areas.

Other terms in correlation with suburban notion are: periurban, banlieue, periphery, umland, hinterland, attraction zone, influence zone, convergence zone.

The notion of suburbs is recently used in the literature of the field. An important researcher is Negoescu, B. (1998), who defines the phenomenon as a belt of villages surrounding the city, where the mutual influence can be observed. Nicolae, I. (2002) mentions that suburban area represents the transition between the two types of settlements: urban and rural. This territory incorporates urban and rural characteristics at the same time. This duality of the suburban areas is the living proof of the city's influence over the surrounding areas. Suburban areas are not homogeneous; their evolution is influenced by the urban centre, by the region's geographical characteristics, by the infrastructure, by the villages' economical and social characteristics (Nicolae, I, 2002). However, the continuous growth of the city and the villages must be taken into consideration, when speaking about suburbs. At a certain point of its evolution the city reaches and incorporates the suburban villages (Cocean P., 2007). As a consequence, the suburban villages become part of the city, while other, more distant villages become part of the suburban areas. The incorporated villages do not disappear, specific characters can be observed during their evolution, owing to the fact that the intercalation of the village takes place in stages.

The delineation of the suburban area can be made by analyzing the development of the population in the city and in the surrounding areas. If the city's population presents a decreasing tendency, while the population of the surrounding villages has grown statistically the phenomenon of suburbanization can be proved (Benedek, J., Bagoly, P. 2005). Iordan, I. (1973) mentions that in delimiting the suburban areas economical, social, historical and natural criteria must be taken into consideration.

3. CLUJ-NAPOCA METROPOLITAN AREA

In the case of our research the delimited area is a little more extended, as the analyzed villages are included in Cluj-Napoca Metropolitan Area. The delimitation of the metropolitan area was realized by the County Council and the local councils. In the impoundment of the area economical, political and social criteria's were taken into consideration. According to this, Cluj-Napoca Metropolitan Area includes the city of Cluj-Napoca and 17 surrounding villages: Aiton, Apahida, Baciu, Bonțida, Borşa, Căianu, Chinteni, Ciurila, Cojocna, Feleacu, Floreşti, Gârbău, Gilău, Jucu, Petreştii de Jos, Tureni and Vultureni. At the end of the year 2009 the village of Feleacu stepped out from the association, while the village of Sânpaul stepped in. These rural settlements stand in a circle of 30 km radius around the city, an optimal distance for the development of the suburban area. The territory of the Metropolitan Area incorporates 23% of the county area and 55% of the county population.

The investigated area is situated on the valley of the river Someşul Mic, comprising also the upper part of the Nadăş valley. In South and North the area is limited by hills, assuring the whole territory the aspect of a valley. According to this, the Northern limit is made up by the Cluj Hills, having over 500 m altitude, while the Southern limit is constituted by Feleacu Hill. The area is situated between 300 and 682 m height, reaching a maximum difference of 382 m.

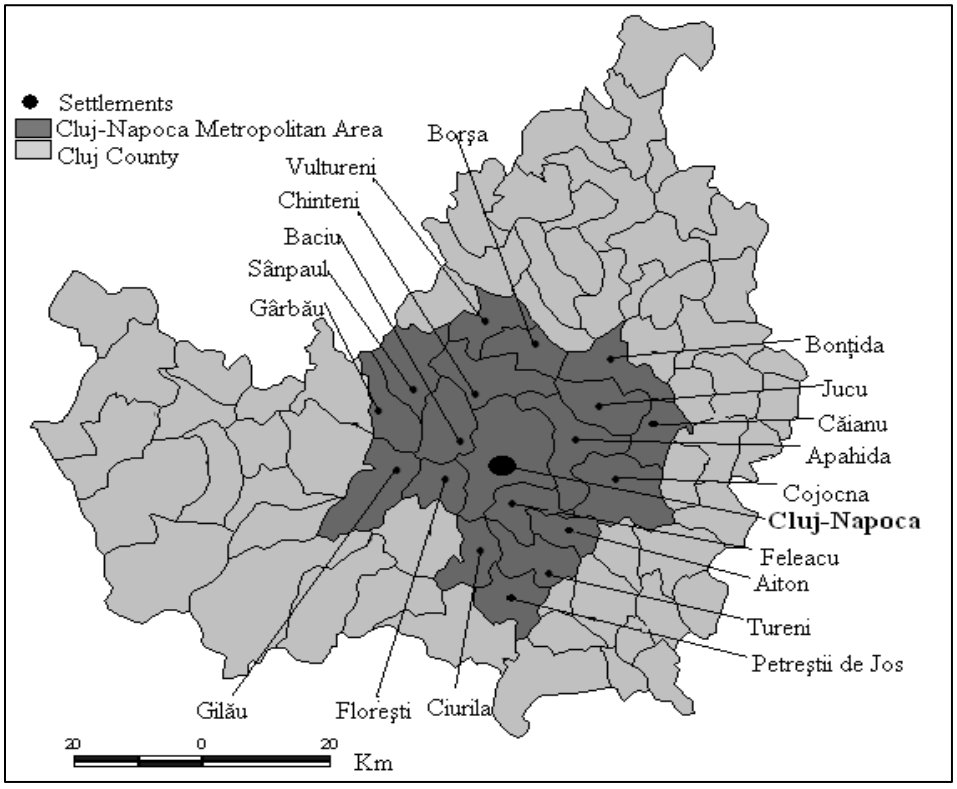


Fig. 1. Cluj-Napoca Metropolitan Area.

The territory is characterized by a diversity of geological formations. In a relatively small area, one can found metamorphic, magmatic and sedimentary rocks of different ages and petrographical types. The hydrology of the area is influenced by the main stream, Someşul Mic River. The river flows between the salt diapir of the Transylvanian Basin, forming the border between the central plain of Transylvania and the Someş Plateau (Cristea V., Baciu C., Gafta D., 2002). From a meteorological point of view, the area reflects the continental characteristics, with cold winters, moderate summers and abundant precipitation. Local and regional dynamics is pronounced enough to refresh the urban air. The temperature inversions are an important characteristic of the area (PUG).

Geodemographical resources offer a complex image over the evolution of the human factor, over the population dynamic and its structure. The population represents one of the major factors of territorial changes.

4. THE EVOLUTION OF THE METROPOLITAN AREA'S POPULATION

The city of Cluj-Napoca is one of the most developed and important cities in Romania. It has an important history, which also determined the structure of the population. The city gained significant importance in the roman period, when underwent intensive development becoming a "municipium" at first, then a Roman colony and last but not least the capital of Transylvania. This intensive development had as direct consequence the demographic growth, a tendency characteristic until the 1990's (Fig. 2). According to this the city registered 19612 inhabitants in 1850, reaching to 50000 in 1900, 114984 in 1942 and 185663 in 1966. In the industrialization period, it registered a more accentuated growth, reaching its maximum in 2000, when it registered 334543 inhabitants.

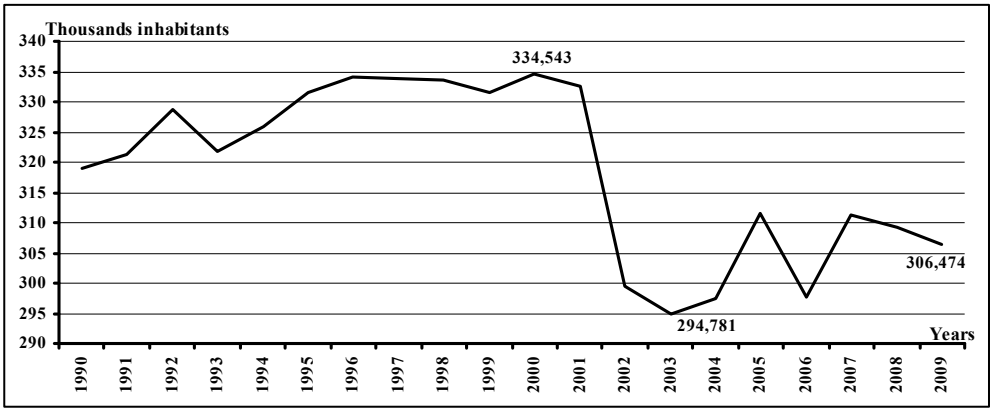


Fig. 2. The evolution of the city's population between 1990-2009.

The collapse of the political system induced a critical period in the structure of the cities. The evolution and development of the cities were determined by processes such are: dezindustrialization, dezurbanization, economical globalization and privatization. Cluj-Napoca was one of the few cities managing to recover relatively quickly from social and economical point of view. This restructuring period can be observed in the evolution of the population, where the significant shift can't be felt as in case of other cities. In the new millennium there is no characteristic pattern: increasing and decreasing tendencies alternate. A sudden decrease was registered in 2002, when the city lost 33000 inhabitants.

Cluj-Napoca became a city at early times, giving the possibility to develop a very significant suburban area. Villages around the city present intensive development with significant population growth.

The population's most spectacular evolution can be observed in villages like Apahida, Floreşti, Gilău and Baciu (Fig.3.). These villages are part of the close influential area presenting the characteristics of suburbs. The village of Floreşti registered 3000 inhabitants in 1850, reaching to 6198 in 1990 and 10595 in 2009. Apahida registered 7455 inhabitants

in 1990, which grow in 20 years up to 9827 persons. Baciu registered a growth of 1323 persons from 1990 to 2009, reaching the number of 8749 inhabitants in 2009. The village of Gilău registered 7778 inhabitants in 1990, growing up to 8384 inhabitants in 2009. In the 4th figure we can observe villages with decreasing tendencies. In these cases migration from the city towards these villages is not characteristic. Moreover they are loosing their inhabitants during population dynamics.

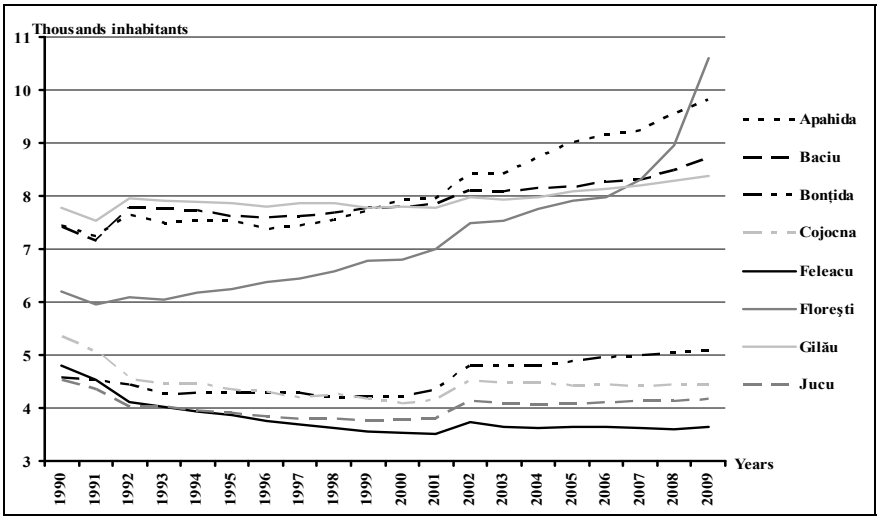


Fig. 3. The evolution of the suburban villages' population, between 1990-2009.

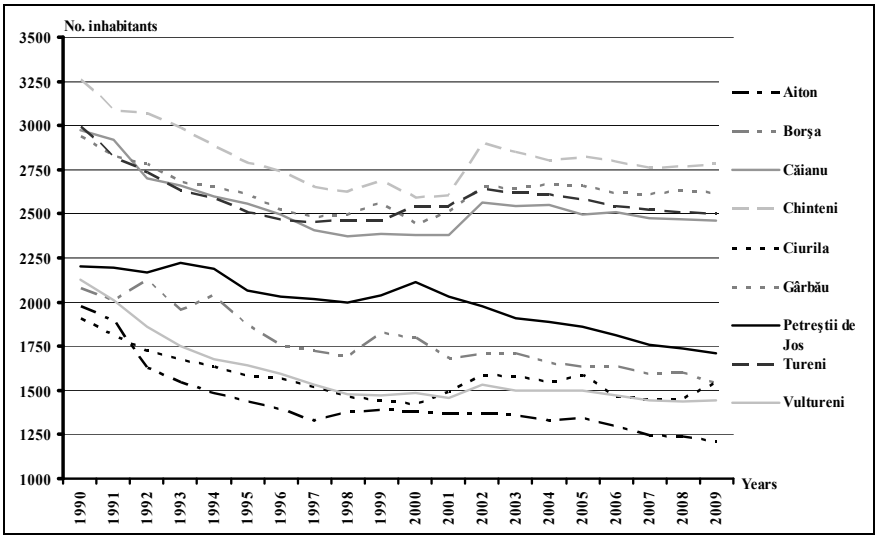


Fig. 4. The evolution of the suburban villages' population, between 1990-2009.

5. POPULATION STRUCTURES IN CLUJ-NAPOCA METROPOLITAN AREA

The division of the population according to sex is also an important factor in the geodemographical structure.

In what concerns the city the division of the population by sex presents similar values during the investigated period, standing out the dominance of feminine sex. In the villages surrounding the city we can observe outstanding values. According to the statistics, male dominance could be observed between 1990-1995, while in the new millennium we can observe the dominance of feminine gender. This tendency is valid for the majority of the villages. Exceptions are villages like Apahida, Căianu, Cojocna and Jucu, where male dominance remained the characteristic tendency.

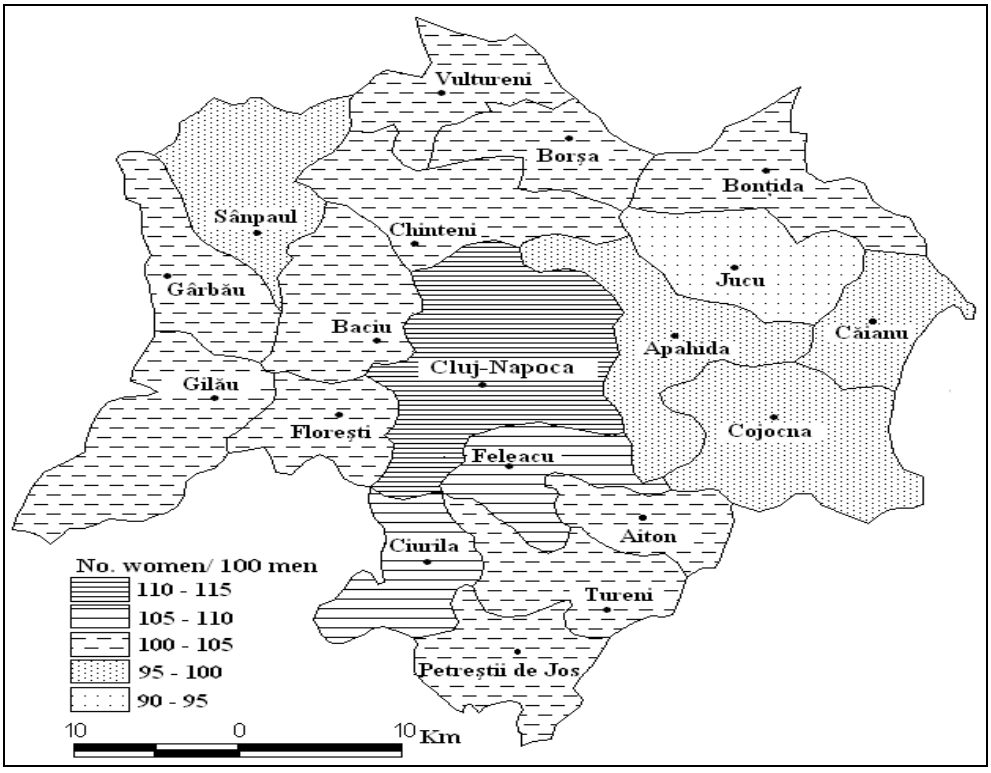


Fig. 5. Feminine index (no. women/ 100 men) in Cluj-Napoca Metropolitan Area, in 2009.

Figure 5 presents the feminine index according to statistical data from 2009. We can observe that the highest percentage of the female population can be found in the central urban area. Other high values appear in the case of Feleacu and Ciurila. Lower percentage of the female population can be found in the case of Jucu, Apahida, Căianu, Cojocna and Sânpaul.

The ethnical division of the Cluj-Napoca Metropolitan Area presents the characteristics of the region's historical, social and political context. The evolution of the ethnical groups can be explained by the historical development of the city and its suburban area. If we study

the evolution of the ethnical groups in historical context we can observe some interesting characteristics. According to statistics the Romanian population underwent an intensive growth starting from 1850, when registered 2522 persons, reaching 105185 persons in 1966 and 251697 persons in 1992. After 1992 its growth became moderate, registering 255677 persons in 2002. In opposition with the Romanian population is the Hungarian population, which registered its maximum in the first part of the 20th century, 97698 persons. After 1941 the Hungarian population started to decrease moderately, so in 2002 it registered only 59652 persons. Other ethnical groups in Cluj-Napoca represent a reduced category, of which we can mention Germans, Jews, Roma and Ukrainians.

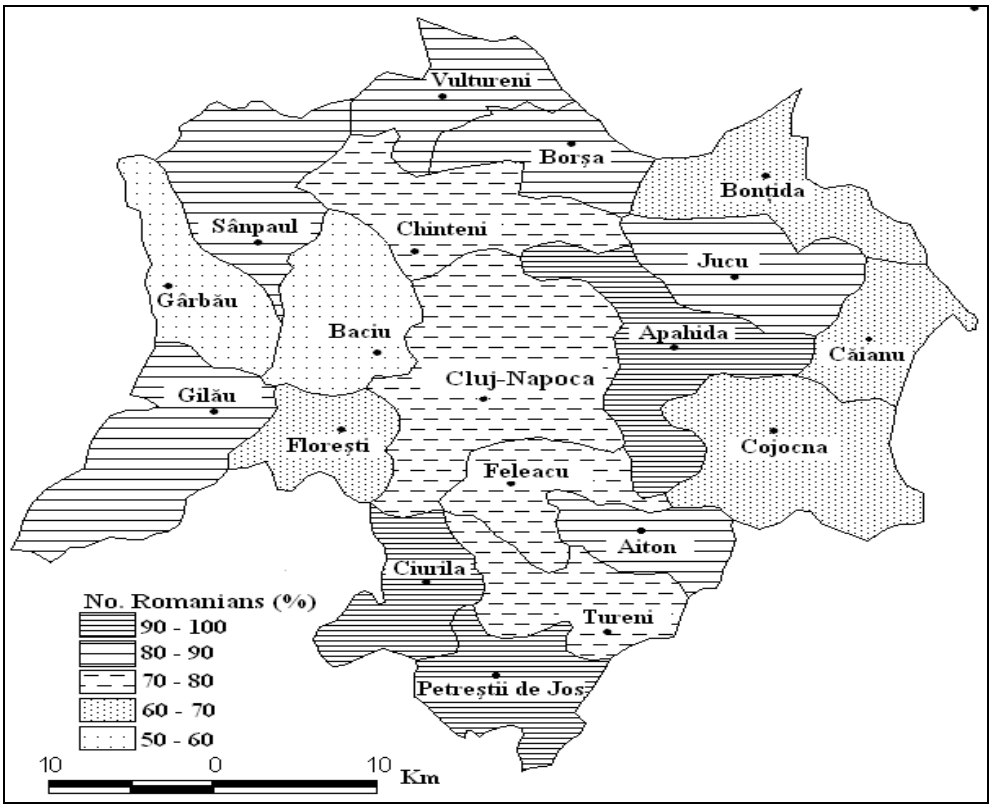


Fig. 6. National Structure in Cluj-Napoca Metropolitan Area, in 2002.

The ethnical statistics in 2002 (Fig. 6) proves the dominance of Romanian population. In the case of Cluj-Napoca the Romanian ethnicity reaches 80% of the total population, while the Hungarian population almost reaches the 20%. The highest values of Romanian ethnicity are registered in Petreștii de Jos, where it reaches 97,8% of the total population. Other villages with high values of Romanian nationals are Ciurila and Apahida. The lowest percentage of Romanian population was registered in the case of Gârbău and Baciu, followed by

Bonțida, Căianu and Cojocna. The highest percentage of the Hungarian minority is found in the case of Gârbău, where it reaches 45% of the total population. Other high values are registered in the case of Căianu (38%) and Baciu (35%). The Roma ethnicity presents high values in villages like Cojocna, Bonțida and Sânpaul.

The dynamic of the population is important from the point of view of resources, because they offer a complex picture of the population and its structure.

The map of the natural growth (Fig. 7) presents an interesting picture about the dynamic of the population. Positive growth in the county can be found only in the case of five settlements: Gherla, Cămăraşu, Câmpia Turzii, Huedin and Măguri-Răcătău. In case of Cluj-Napoca, the natural growth rate is between -5 - 0‰. This is the case of the close suburban areas too, including Baciu, Floreşti, Gilău, Apahida and Bonțida. In villages of the Metropolitan Area we also find high negative values reaching to -15 - -21‰, as in the case of Aiton, Ciurila, Petreştii de Jos and Vultureni.

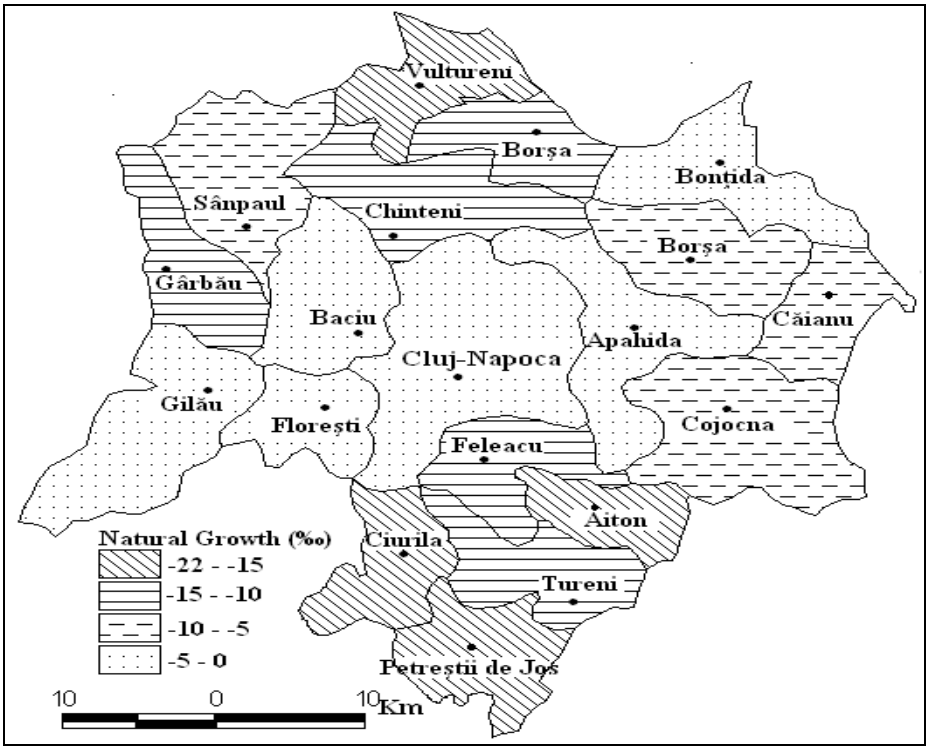


Fig. 7. Natural Growth Rate in Cluj-Napoca Metropolitan Area, between 1990-2008.

An important element in the researches about urban regions is the density of the population. The preoccupation of scientists for this aspect can be explained by some problems, which appear as a consequence of this factor. The density of the population automatically brings up problems such are: socio-cultural equipments, the capacity of the infrastructure, the appearance of new residential areas.

Within urban region the population density presents high differentiation. This is determined by a series of factors such are: the evolution of the functional structure, natural conditions, socio-historical characteristics and the extension of the city's territory by including into it new areas. According to statistics, in 1920 the city's territory recorded 1624 ha, in 1948 2000 ha and in 1992 approximately 3017 ha. (Cristea V., Baciu C, Gafta D, 2002).

In 1969 we can distinguish the following territories:

- the density of the population exceeds 200 inhabitants/ha in the new section of Gheorgheni, where approximately 10000 apartments were built, concentrating almost 30000 inhabitants;
- the density of the population is between 100-200 inhabitants/ha in the central area;
- density between 75-100 inhabitants/ha is registered in the north part of the city;
- density between 50-75 inhabitants/ha is characteristic in the quarter of Grigorescu and Pata;
- density between 25-50 inhabitants/ha in characteristic for residential areas like A. Mureşanu, Dâmbu Rotund and Mănăştur;
- less than 25 inhabitants/ha is characteristic to Someşeni, a village incorporated by the city in 1952;

By the year 1992 the situation presents totally opposite values:

- density between 200-300 inhabitants/ha is characteristic for two „socialist" quarters: Mănaştur and Aurel Vlaicu;
- density between 100-200 inhabitants/ ha is specific to the quarters of Zorilor and Grigorescu;
-density between 50-100 inhabitants/ha can be found in the central area and in quarter like Gruia, Iris and A. Muresanu;
- density under 50 inhabitants/ha can be found in the half rural territories, like Dâmbu Rotund, Baciu, Oaşul, Someşeni, Becaş and Borhanci (V. Cristea, C. Baciu, D. Gafta, 2002).

The division of population by age in Cluj-Napoca (absolute value and percentage)

Table 1

Years	0-19	20-59	>60
1930	37279	61681	4880
	35,9	59,4	4,7
1966	54956	109170	21537
	29,6	58,8	11,6
1977	79120	150880	32857
	30,1	57,4	12,5
1992	99238	187960	41404
	30,2	57,2	12,6
2002	99439	201991	16523
	31,3	63,5	5,5

The structure of the population by age (1. Table) registered a growth similar to the evolution of the population. Half of the cities population consists of mature population, but this registers a decreasing tendency. The mature population registered 59,4% in 1930, and only 57,2% in 1992. Opposite to the mature tendency is the elderly population, which registered an intensive growth from 4,7% (1930) to 12,6% (1992). The youth population presents different values, which recorded its maximum in 1930 (35,9%) and its minimum in 1966 (29,6%). Between 1977 – 1992 the youth population presented a relative linearity.

Population structure by age in the suburban villages of the Metropolitan Area presents similar values with the central city. The mature population registered decreasing values between 1966-1992, but maintaining itself fewer than 50%. The elderly population registers growing tendency reaching 20%, and in the case of Feleacu it reaches 28,47%.

The structure of population by age is extremely important, because it shows the phenomenon of aging in contrast with young population. With the increasing tendency of the elderly population and the decreasing tendency of the mature population the phenomenon of aging can be proved, which is one of the most important elements of the geodemographical resources.

The division of population by age in Cluj-Napoca close suburban area

Table 2

	1966				1992			
	Total	**0-19**	**20-59**	**>60**	**Total**	**0-19**	**20-59**	**>60**
Apahida	7621	2763 (36,3%)	4037 (52,9%)	821 (10,8%)	7640	2190 (28,7%)	3973 (52,0%)	1477 (19,3%)
Baciu	7330	2187 (29,9%)	4271 (58,3%)	872 (11,9%)	7764	2179 (28,1%)	4158 (53,6%)	1427 (18,4%)
Feleacu	5549	1830 (32,9%)	2973 (53,6%)	746 (13,4%)	4110	864 (21,0%)	2076 (50,5%)	1170 (28,5%)
Floreşti	6013	1905 (31,7%)	3363 (55,9%)	745 (12,4%)	6088	1723 (28,3%)	3162 (51,9%)	1203 (19,8%)

The number of employees in Cluj-Napoca presents a decreasing tendency until 2000, when it registered a number of 113063 employees, followed by a moderate growth, reaching 132173 employees. According to this statistics in 1991 52, 76% of the population was registered as employee, while in 2008 only 42, 73% of the population shared this status.

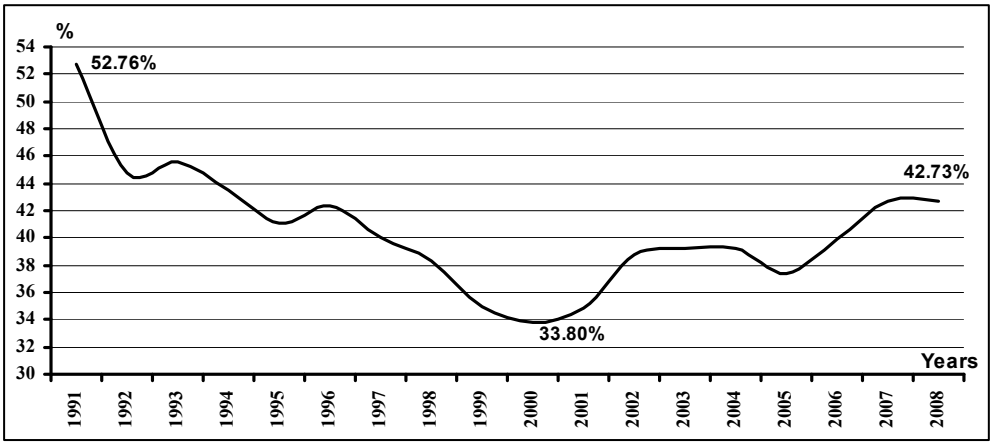


Fig. 8. The proportion of employees in Cluj-Napoca between 1991-2008.

In the case of the villages of the Metropolitan Area, we find cases of increasing and decreasing tendencies. Bonţida registered an impressive number of employees, 39.35% in 1991, than underwent a significant decrease, so in 2008 reached only 9.30%. Another similar case can be observed in the case of Gilău, which also registeres a significant decrease from 30.54% (1992) to 16.05% (2008). Important growth were registered in the case of Floreşti, a

growth of 15,11% in 17 years and Apahida, which registered a decreasing tendency until 2000, then a continuous growth. Villages situated in the periphery of the Metropolitan Area, like Petreştii de Jos and Ciurila registered low values of the employees, only 4.71%, respectively 5.1%.

According to statistical data from 2008 (Fig. 9), the highest proportion of employees was recorded in the central urban area. In the case of Cluj-Napoca the number of employees reaches 43%. Other high values are recorded in the close rural settlements, such are: Baciu, Floreşti, Gilău, Apahida and Jucu. The lowest values of the number of employees were registered in the periphery of the metropolitan area, in villages like Vultureni, Cojocna, Aiton, Petreştii de Jos and Ciurila, where the number of employees does not reach 5%. Other low values can be found in the case of Gârbău, Sânpaul, Chinteni, Bonţida, Căianu and Tureni.

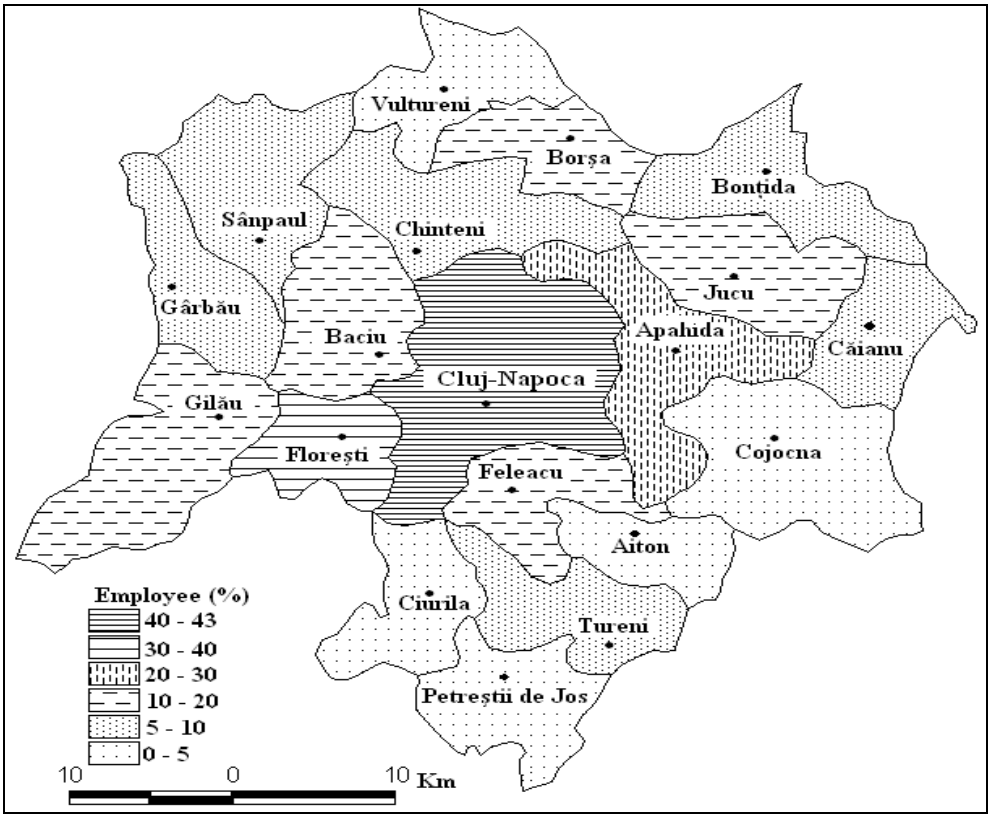


Fig. 9. The proportion of employees in Cluj-Napoca Metropolitan Area, in 2008**.**

6. CONCLUSION

In conclusion, we can mention that Cluj-Napoca Metropolitan Area has important and diverse geodemographical resources and studying these factors is extremely important from the point of view of urban planning, economical planning and socio-economical planning.

The population growth registered between 1990 and 2009 in Cluj-Napoca Metropolitan Area presents a diversified picture. In the case of Cluj-Napoca, the initial growth was gradually changed by decrease. Still, the city has major economical, social and cultural importance in the region, which contributes to a relative balance in the number of the population. Majority of the villages setting up the Cluj-Napoca Metropolitan Area present suburban tendencies, while in some cases one can notice the loss of the population.

The ethnical end confessional structure of the area presents a varied picture of the region's population.

According to the birth rate in Cluj County, between 1990-2008, we can observe that five settlements present positive values in the county, none of them in the Metropolitan Area. In some cases the birth rate reaches -15- -21‰, as the case of Aiton, Ciurila and Vultureni. In contrast with the birth rate we find the migrational scale, which presents extremely high values in some cases, especially in the case of the urban center and the close suburban villages like Floreşti, Feleacu, Baciu and Apahida.

The structure of the population by age presents unequivocally the growth of the elderly population and the phenomenon of aging. This tendency is similar in the urban center as well as in the suburban villages.

The number of the occupied persons presents acceding tendency in Cluj-Napoca in the new millennium. In the close suburban areas we find the same tendencies, but in the case of the farther villages the number of employees does not reach 10%.

R E F E R E N C E S

1. Benedek, J., Bagoly, P. (2005), *Procesul de suburbanizare din România. Studiu de caz zona periurbană a Municipiului Târgu Mureş*, Studia UBB, Geographia, Anul L, 2, Cluj-Napoca.
2. Cocean, P. (2007), *Amenajarea teritoriilor periurbane. Studiu de caz: zona periurbană Bistriţa*; Presa Universitară Clujeană.
3. Cristea, V., Baciu, C.; Gafta, D. (2002): *Municipiul Cluj-Napoca şi zona periurbană. Studii ambientale*; Editura Accent, Cluj-Napoca.
4. Ianos, I., Tălângă, C. (1993), *Impactul imediat al prăbuşirii regimului politic comunist asupra sistemului urban românesc*, Analele Universităţii Bucureşti, Geografie, 312/2, Bucureşti.
5. Nicolae, I. (2002), *Suburbanismul ca fenomen geografic în România*, Presa Meronia, Bucureşti.
6. Nuissl, H., Rink, D. (2005), *The 'production' of Urban Sprawl in Eastern Germany as a Phenomenon of Post-Socialist Transformation*, UFZ Centre for Environmental Research Leipzig-Halle, Department of Urban and Environmental Sociology, Leipzig, Germany.
7. Pop; P. Gr. (2007), Judeţele României. Judeţul Cluj, Edit. Academiei Române, Bucureşti.
8. Tosics, I. (2004), *Városi fenntarthatóság és Budapest városfejlesztési koncepciója*, Budapest.
9. PUG Cluj-Napoca, Analiza situaţiei existente, 1998 (General Urban Plan – Analyses of the existent situation).
10. Planul Integrat de Dezvoltare pentru Polul de Creştere Cluj-Napoca. Zona Metropolitană Cluj, 2009-2015 (Integrated Development Plan for Cluj-Napoca Growth Pole. Cluj Metropolitan Area).
11. www. nepszamlalas.adatbank.transindex.ro
12. www. insse.ro
13. www.cjcluj.ro

STUDIA UBB GEOGRAPHIA, LVI, 2, 2011

HEARTH AND ESTATE. INCURSIONS INTO THE WORLD OF PRE-CHRISTIAN AND CHRISTIAN RITUALS

PUŞCAŞ - COVACIU ANGELICA[1]

ABSTRACT. – Hearth and Estate. Incursions into the World of Pre-Christian and Christian Rituals. Until the moment of formation of the great religions, the needs and the beliefs were substantially the same for the man found in any inhabited space, a process that determines their progradation, and equally the transcendence from prehistory into history from the empirical communities to superior cultures and civilizations. The entering of these mental components into a wide process of acculturation leads towards a fertile evolution of the religious heritage, followed by the revealing of the landmarks of identity, of the cultural-anthropological identity. That is why we find the Romanian ancestral, sacred, village and the apotropaic semiotics of the circle, integrated within this traditional-religious osmosis, revealed in the quasi-dimensionality of life.

Keywords: *settlement, village, territory, border, estate, population, community, nation, inhabitants, origin, order, chaos, pomp, maleficent, blessed, cursed, rituals, customs, superstitions, beliefs, wheel, circle, enclosure, knot-shaped bread, solar deity, ancient man, christened man, furrow, joint proprietor, peasant, field, rural, rustically.*

1. INTRODUCTION

Population, hearth and territory are defining elements for the concepts of habitat, settlement, village; their origin being, in a logical way, a resultant of sedentarisation.

For millennia, these dimensions have hardly been contaminated by significant structural changes, the traditional village of the 18^{th} -19^{th} centuries, sensitively bearing, the same characteristics with the Neolithic, Geto-Dacian or Medieval villages. However, by defying the load of numerous similarities, within the lived reality, a note of differentiation with a desultory impact appears, from the social-cultural point of view, namely: the *desacralization of the village* at the level of the entire system that individualizes it.

2. THE VILLAGE, AS A CONCEPTUAL UNIT

A definition of the village, at present, would "fit" into the concept of *rural settlement as a functional system*, and if we would try to anticipate a more detailed definition, we would underline, that the rural settlements represent *dynamic systems*, which regardless of dimensions, are grounded by three major coordinates – *population, the hearth and the territory* – categories that are assumed, equally, as autonomous systems, but these must be necessarily understood as subsystems of the entire rural settlements as well.

[1] *Babeş-Bolyai University, Faculty of Geography, 400006, Cluj-Napoca, Romania, e-mail: apuscas@geografie.ubbcluj.ro*

Population, hearth and territory are defining elements for the concepts of habitat, settlement, village; their origin being, in a logical way, a resultant of sedentarisation.

For millennia, these dimensions have hardly been contaminated by significant structural changes, the traditional village of the 18th -19th centuries, sensitively bearing, the same characteristics with the Neolithic, Geto-Dacian or Medieval villages. However, by defying the load of numerous similarities, within the lived reality a note of differentiation with a desultory impact appears, from the social-cultural point of view, namely: the *desacralization of the village* at the level of the entire system that individualizes it.

The terms used in the definition mentioned above are technical, arid – accurate in scientific respect – but denuded of emotionality. Magical-sacred language and gestures were lost.

We would notice the same thing if we would further on define population, hearth and territory. The conclusion? Their content is reduced to that of statistical, social, economical indicators, reflecting the current condition of the rural settlement, somewhat, beheaded of its roots, traditions and beliefs.

Order and chaos, pomp and evil, blessed or cursed, rituals, customs… are *meanings* that are still preserved only by that geography and by that passive mentality of the profound village.

Until recently the inhabitants were: *population, community, nation*, and the territory was the *border*, it was the *estate* or homeland– the latter name making an intimate reference to the appellative - forefather, here with the meaning of ancestors, of forerunners, the link between *the underworld and the world of the living*, between *past* and *future.* Similarly, *the village* (see Latin *satu-um* = ploughland), both in pre-Christianity and in the Christian era, the improper significance of *sacred space* – an attribute transferred upon *the house*, seen by Mircea Eliade as *"imago mundi"* – a human universe, build in accordance with the immediate nature and "without the measure" of the cosmogonical scenario.

Within this context of values, the pre-Christian man and later the one who became christened, arrogates to himself, as a primary task, the placing under protection of his wealth: the estate, the animals, his house, his family.

3. THE APOTROPAIC SEMIOTICS OF THE CIRCLE

The certainty that the wheel, the circle, the enclosure were attributed with mystical and magical valences of defense, of driving away or at least of keeping at distance the evil spirits, of the dangers, in generally, is evident not only in our prehistoric culture, its scope is universal.

The ancient man, whose age we count in millennia, was living outside of what we call today "schizoid personality". Communion with nature was an umbilical one, and superstitions and beliefs in: *solar deities, The Great Goddess Mother, into deities of order, in ghosts* and *spirits*, were defining its mental nature in an absolute way.

Within the collective imaginary, *good* and *evil* had their immediate correspondence in light and darkness, the great crisis moments of the year, occurring at the solstices, when the night was "devouring" the day gradually, and man – even if dominated by terrors – felt obliged to intervene by coming to the assistance of the solar deities. Therefore, he lighted fires in order to magnify the power of the deity, he brought sacrifices, he set up rituals and ceremonies, and the world, and his universe regained its purposes. His efforts have been taken into account, and hope in the protection of the divinity is comprised within the central reason of existence.

The form of the solar disc, as a representation of the good is "enclosed" in symbols, in actions that the *ancient man* turns into organic part of his life and of the space he lives in. A primary step, religiously determined, is – as I mentioned – the placing under protection of the wealth, of the property, by surrounding it with fortifications; the angle from which the thesis of the origin of the term *village* (fosat), coming from the Latin word fossatum (ditches of consolidation), is plausible.

The magical significance of the *wheel* is then synthesized from the direct contacts of the man with the environment, from observations, from experiences.

In this sense we have the enlightening example of the *circle made by the animals* when fighting or when defending themselves; the cubs being protected within the space from the interior of the *wheel*, of the *circle*. The dog, in state of danger, circles around the herd of animals or around the paddock, an action having its source in the very same need. Faith in the wholesome strength (of protection, of fertility, fecundity…) of the signs, materializes in a natural way in the circular plan, shape of a home as well, implicitly in the texture of the village; in the fence made out of wattle, branches, thorns… in the animal enclosure; in the esthetics of the sanctuaries; in the pot-bellied (spherical) shape of the earthen pots; in the wheel of the potter; in the round shape of the table (see round table); in ornamental designs (circle, semicircle, spiral, rosette); in the contour of the shamanic dance or, by propinquity, in the circle of the "căluşar" – Romanian man's folk dance; of the dance performed by *pixies* etc.

Therefore, we find the apotropaic charge of the circle being present within almost all dimensions of life.

Until the moment of formation of the great religions (whether monotheistic, polytheistic or of philosophical origin) needs and / or dangers – and thus beliefs – were substantially the same for the man found in any space destined for living, a process which also determines their progradation and similarly, the transcendence from prehistory into history or from the empirical communities to superior cultures and civilizations. The entering of these mental concepts and especially of the animistic religion into a broad process of acculturation leads towards a fertile evolution of the religious patrimony, followed by the detecting of the landmarks of identity, of the cultural-anthropological identities. That is why we find, absolutely integrated, from the sacred point of view – within this traditional-religious osmosis – the traditional Romanian village of the 17^{th} – 19^{th} centuries and even of the 20^{th} century.

Deities of order, for example, the *God of Vegetation*, of the crops and the patron of the animals (especially the horse, a solar symbol as well) will be identified in the Geto-Dacian (pre-Roman) culture and civilization in the posture of the *"Tracian Rider"* – presented by Christian iconography in the appearance of *Saint George* killing the dragon and preserved in folkloric culture as an agricultural ritual: *Sângeorz holiday*. In the similar way, the *God of Storms* will be associated to another martyr "military" – *Saint Elijah* and the *Day of Saint John the Baptist* – the third Christian holiday related to the birth of a biblical character – will be assimilated by the magical agrarian ritual of the *Midsummer Day* (St. John's Day, of the Pixies), mystical beings (commonly described in the form of beautiful maidens) with a duplicitous behavior – depending on the way they were honored, revered.

The purpose of the offering, of the sacrifice, both as an act of redemption, and as an act of rebirth, of creation (see the sacrificing, the killing of the pig at the winter solstice or the one of the millennium on the eve of *Pastoral New Year*) or the sacred connotation of the fire are – out of numerous categories of traditions – genes of ancestral beliefs on which Christian holidays will be established.

Returning to the central theme: *the mystical reverberations of the circle* found in interrelationship with the estate, we emphasize the remarkable longevity of the practices of demarcation of the border lines of the localities, by using specific signs. Time of reference – the 19th century – the beginning of the 20th century.

It is a period of a more steadfast political stability and of administration on the behalf of the traditional village, a state oriented toward the numerical growth of the population that is found in the process of "demographical swarming". The resultant of these interactions represents the genesis of new settlements, frequently called, depending on other causal features, village areas or tax-redempted villages that are to be repopulated.

The phenomenon of "demographical swarming", highly expressive through the beauty and the wisdom which it assumes, meant for the good purpose of the village, the clearing of a space found under the pressure of a super-dimensioned need of resources and the migration of a part of the community within a territory, afforested, as a rule, favorable for sedentariness.[2]

Those who "swarmed" were always the mature segment of the community, they being worthy of such an undertaking, as physical strength, as accumulated experience but also as bearers of the customs.

After the deforestation and precursory the building of houses, the *Law of the Land* compelled to the determination with precision of the border lines; or here is where the nuanced charge of the magical and sacred rituals intervenes here and there, yet, in fresh strokes.

The estate, once appreciated as being a *good place*, by the *elders* of the village ("wise and good people"), that is to say, untouched by negative energies – curses, spells, charms, sinful actions, murders, ghosts, plagues etc. – must be placed under divine protection by *"tracing a furrow around it."*

Is the very first act having magical valences. The circle created with the furrow conferred the power to stop *all the bad things* (plague, cholera, invasions, hail, evil spirits, spirits of the dead…) outside of it. The village became in this way, the pre-established cosmic order, and a purified world, isolated, and created by using a magical circle (A. Bodiu, 2005).

From the sources of the archaic[3] mentality, we find out about the way a furrow was to be traced, that: the plow was pulled by "two twin black oxen"; by "two twin oxen, driven by to twin brothers"; by "four black oxen born on Saturday which are to be driven by two people, twin brothers or by two first cousins".

The act of the furrow ritual was generally consolidated through the motif of the sacrifice. With a higher frequency in the distant past and then, less often, the oxen used to

[2] *The main characteristic of the place was quality, and not only the edaphic one. The place may be good or bad, blessed or cursed, pompous and nefarious…, attributes which, even tough complementary, bear different connotations and energies, among which the first ones are the ones that bring balance, harmony, while the secondary are accompanied by the evil, by the lack of fruitfulness. Taken together, the information of the two matrices, create a dominance of the soul of the peasant, sensitive to the presence of good, but especially to the interference of evil.*

[3] *"When in the ancient times, a village was established, two twin oxen were found and two men, brothers, twins, they were crafting a plow with their own hands, one of the brothers was holding the plow by its horns, and the other one was driving the oxen and in this way they were tracing the furrow around the village. The belief was that the furrow was protecting the village against plague." (I.Tosa; Simona Munteanu – 2003).*

be brought as a sacrifice and buried in a place found in the new "border area" (border line). Similarly, the customs were placing under a harsh interdiction the building of any house "outside the furrow" or the violation of the border line – in the sense of crossing it, of making random paths. The one committing such a sacrilege was killed, saying that: "he made a way on which malicious things and illnesses will be able to enter into the village". The access into the village could be done only through certain places (see "the gate of the field, crucifixions, roadside crucifixes…) exempted by rituals or by "blessing from the priest."

Simultaneously to the *tracing of the furrow*, the establishing of the border line signs was taking place as well, by burying a stone, logs, or knots under the ground… which in time took the shape of small knolls covered with grass, called "mounds". The settling of these signs was accompanied by gestures and rituals of high resonance, so that they may remain alive within the memory of the community. Knowing them generation after generation was highly important – beyond the spiritual valences – from pragmatic reasons as well, the actual knowledge of the frontier and of the vicinities.

For this purpose, the desired impact was created by the ceremonial practices of *the oath* and the *ritual battle*, both taking place at the *border line mark*.

The first action focused on the essence of the oath (done whether in the presence or in the absence of the priest) as a value that could not be broken, the power of the act being fully dimensioned by the compulsoriness of the confession and that *no one would ever change the border line marks*. This oath had to be taken by each and every member of the community. The tones of the entire ritual were equally serious and solemn[4], not even curses[5] were lacking from the scenario.

In the *ritual battle*, the main "actors" were the children, they being the most suitable to carry in time, and after that to transmit the information connected to the delimitation of the border line. The gestures of the battle, performed by the older men with the children, were usually short, determined, almost not aggressive at all but of a greater emotional impact, shame being, within this ceremonial act, a prevalent feeling: "An older person would take each child and hit their heads against that border line"; "Three or four boys were taken by their hair with the purpose to recall the moment when it was elaborated"; "A boy would be summoned and the older man would grab him by his hair (he performed a *mill* on him) in order not to forget the border line"; "The children were sat on the ground and they were flogged five or six times in order to better remember and narrate the events happened on that day to their children" (according to A. Bodiu – 2004). At the end, the children were rewarded with gold and silver coins, the ritual battle implying connotations of sacrifice, of offering.

---

[4] *"People have the habit to ask the priest to read the ritual prayer for the remission of sins, the oath and everyone holds with their hands the stones which they are preparing to stick into the ground, then they swear that the descendants of those who would change the border line marks would all die." (I.Tosa; Simona Munteanu – 2003).*

[5] *Before, when a border line mark was to be buried in the ground, a stone in most of the cases, cool coals were placed next to the stone and people would say: "Just as these coals got dry so shall the one who would move the border line", and after the border line was buried, burning coals of tell tree were placed above it, which after people spat on it, was hit with a hammer causing a bang and said: "So shall the eyes of the one who would move this border line burst." (I.Tosa; Simona Munteanu – 2003).*

Another ritual following after the practices of delimitation of the border line by using the circle made out of a furrow, was the fulfillment of another major sacred act, with fundamental capacities regarding the protection and the maintaining of the unity of the community, by the assuming of the unity of faith. It is about the selection of the *place for the building of the church*. Therefore the process of identification of the *good place* is resumed. Its positioning had to be a central one and if the topographic surface was allowing it, on a higher ground portion, so that the holy place – for the quiet and peace of the community – to be visible from any point. During the same ceremony three sequences were unfolding: the *service of sanctification of the place*; the ritual meal – prepared by the priests[6] of the village and the *tramping dance* – archaic dance performed by going from one house to another, using tramping and energetic steps, saying that "they have beaten the (path) steps of the village" (see "Bătuta" – Romanian folk dance, from Maramureş, "Bătrânescul" – Romanian folk dance, from Pleşca, Sălaj County etc.).

The establishing and the entering of the village into its roles, was not equivalent with the disappearance of the magical and sacred practices of protection. Their dynamics continues to be extremely active, and the action of staying on watch proportional to the incidence of certain dangers or threats, whether taking place in the inside (deserted places, abandoned houses, lack of paying attention to the spirits of the dead, disregarding the marked days – important days, the neglect of good traditions etc. .) or on the outside (invasions, epidemics…), was permanently reactivated. Therefore, in situations of extreme risk, such as plagues which were ravaging the neighboring regions, people were proceeding back to the renewal of the magical circle, by tracing the furrow with a plow; act performed this time by naked women.

There were other actions as well, that were performed having the similar purpose, and from the perspective of the coplementarity of support, such as placing the *plague shirt* – sewn and made in one single day (starting with the spinning of the wool, weaving, sewing) - on the border line between the villages. Similarly, the *dance called Căluşari* – a Romanian folk dance, had valences with the purpose of rebalancing energies.

4. THE RURAL COMMUNITY. PATTERNS IN THE EVOLUTION OF LAND CULTIVATION

A defining characteristic for the rural community derives from the mixed nature of the landed property closely interconnected with the preponderant way of joint farming exploitation, respectively the forester one. On the grounds of these regularities, public estate was uncovered proportionally to the manner of use – individual or collective – in two unequal groups, as far as the share was concerned. Therefore, a part of the land, the one afferent to the house, to the garden and to the vine from within the hearth of the village enters into the *private possession* of the holders of each family, while the remaining part of the landed property belonged to the *common property*.

[6] *The pastoral cell, integrated on one side from a brotherhood made out of a hierarchy (shepherd, milker, herder) and on the other side from the ensemble of the material components, is detached in the world of the traditional village, through a high prestige, a value that individualizes it as a social and economic autonomy.*

In its turn, common property or the property of the community knew two distinct ways of exploitation, on *family lots* and *joint ownerships*.

In the first case, a great part of the arable land was periodically divided, usually every three years, to families, according to their necessities and their possibility to work the land.

The dividing of the land into lots was done by using the system of casting lots – an operation which leaves as inheritance to our language toponymy the element "fate", "destiny" – viable currently only by its use of the ageing rural population.

The rest of the arable, together with the meadows, pastures, forests, lake areas, implicitly running waters, were used *jointly*, in common, that is to say through the physical, pecuniary and technical co-operation of all the families. The production thus obtained, had a very special destination, forming the so-called *reserve of the community*, accessible in situations of naturals perils (drought, floods) or of social risks (conflicts, epidemics etc. .)

Gradually, as the result of the increase of the labor productivity, a persuasive trend is manifested – mainly from those who achieved a certain level of welfare (synthesized on the background of the corroboration of a concurrence of factors – a greater and more fertile "fate", a more significant number of beasts of burden, a better rated position within the public hierarchy etc.) – of individualizing their plots, and to transform them into permanent family properties, with the right to be handed down hereditary. At the same time, some of the land destined for agriculture, the pastures, forests and the waters remain in the possession of joint property, a situation encountered in certain regions (see Vrancea Country) until nowadays.

The important thing is that, the germs of this process of differentiation between the members of the community, will establish the premises of the distribution or of the dividing of the society into classes with antagonistic interests – that will contribute to the dissolution of the community and to the consolidating of the feudal type relationships.

As to the generating of an accurate image concerning the behavioral model of the community, we will appeal to several particularities or even to customs, connected to the economical use of the land and of the way of organizing households.

The agriculture specific to that time – can be integrated within the mixed – extensive type, with its focus on the segment of plants cultivation. We emphasize the fact that this purpose must rather be understood from the perspective of the concentration of the volume of labor with the purpose of dimensioning of the arable and not as the major part within the amount of the agricultural production – where the important branches continue to be, animal breeding, hunting and fishing, to which harvesting from wild nature is added.

Therefore, in the context of a high level of afforestation (appreciated until the 18th century to over 70%) and on the background of the needs, reclaimed by a growing population, the process of extension of the arable or of the surfaces with pastoral destination, becomes even more acute.

With this end in view, the community proceeded to the application of some techniques of deforestation and/or fallowing, depending on the case, the most widely used being the system of cutting or burning (arson), of the forest. The way of approach is well received at the present moment by the raised frequency of several border line toponyms such as: scorching heat, devastation, apiary, man-made clearing in a forest for cultivation purposes, and so on.

Until the moment of generalization of the system of biennial rotation or of agriculture in two fields *"fallow land and hay-field"*, succeeded in the same rhythm with the changes

taking place in the society and, once with the development of technology, systems of archaic culture which could be integrated from the typological point of view within cycles of the following type: *forest – grass – forest; forest – cereals – forest; lay land – fallow land – stubble field – lay land etc.* .

A more developed stage, characterizes the triennial system of rotation, used – in the developed feudal times - within a geo-space, which was limited to the inner part of the Carpathian arc.

Turning to the archaic type agriculture, it can be appreciated that in its early phase, the deforestations had, as a main purpose, the extension of the pastoral estate, through the clearing of the forests from different surfaces, which initially were limited. The immediate result was the obtaining of some ephemeral glades used primarily as hey-field, and secondarily, after the first or the second mowing (according to the orographic and climatic particularities) as so-called pastures. Their profitableness was short-lived. After several years of consecutive use, they would enter into involution, the fertility of the soil gradually diminishing by the lack of contribution of nourishing elements, but also on the background of mechanical erosion, more pronounced in the areas traditionally used for goats and sheep breeding.

As far as the natural change of the events was concerned, grounded on an instinctive way of living (nowadays we would call it ecological), the meadows were abandoned, the forest re-entering into its rights.

It is interesting, that after approximately 20 – 30 years, time equivalent to the reaching of full development of a new generation, a new intervention was performed on the same places for cultivation purposes. In this context, the significance of the traditional saying is proven, a saying recorded by George Popovici that says:"good cheese comes from new deforested fields".

Therefore we are witnessing the development of one of the first cycles of using the land – *"forest – grass – forest"* – hard to categorize from the temporal and spatial point of views.

Later, the increasing demand for food but also the sensitive improvement of the agricultural techniques, require for a refining, through the evolution of the older system – a desire fulfilled by the introducing of a new stage consisting of the use of deforested fields as agricultural land. The cycle marks in this way a superior level of development materialized by the formula *"forest – grass – cereals – forest."*

On such type of lots, an alternate method is used, hey-field mixed with cultivated plants, especially cereals.

It is the first step toward a revolutionary type of exploitation, the one in "*wild fallow – forest-pastoral"*, which will constitute the foundation of a time resistant agricultural model and of wide space applicability, being exceeded, rather late, due to the intervention of crop rotation.

On the freshly obtained "deforested areas", the rotation was reduced to a succession of "grass – cereals" type, without a precise rule as a temporary aspect. Usually, the cereals were sown every second year or in groups of two-three years, followed by as many years, with grass, according to the evaluation performed by the community or by the householder.

Regarding the feasibility and the new system that was introduced, exposes a character marked by instability, after the draining of the fertility of the land, it is continued to be used as a forest.

A particular way of exploitation is registered in the "*forest – cereals – forest"* cycle, being a main specific type in the mountainous settlements, lacking in arable land.

The deforestation of the land was carried out on limited, enclosed regions, with the purpose of obtaining, as sooner as possible, the so called *"gardens"* – favorable to the cultivation of a reduced number of plants – corn, rye, potatoes – but absolutely necessary in a nutritious protein diet, based "sine qua non" on animal products.

As a matter of fact, in regions such as Dornelor Country, Vrancea Country, the region of the Apuseni Mountains (Ţara Moţilor), in Maramureş or in Chioarul Înalt, the first place, in agricultural economy, belonged to the zootechnical sector, the cultivation of cereals intervened ocassionaly and insignificantly as surface, in size.

Another extremely important leap in the development of agriculture is the tendency of embezzlement of the forest, out of the stated cycles of rotation. An ultimate substitution of this was desired, by the perpetuating of *lay land*. It is doubtless, that for the considered historical time, the cultivation with grain, each and every year, was practically impossible, the fertility of the soil of forested origin proven to be particularly vulnerable – the loss of nutritional elements happening in an accelerated pace. As a remedy, the establishing of agricultural – pastoral rotations, where the hay-field alternates with the meadow plants, is used as part of a first stage.

It is also a *"fallow land"* type system, but in a more evolved patters, without forest character. It is also known under the naming of *"not established fallow land"* because of the alternation between the hay-field, respectively cereals, was an arbitrary one.

In the Apuseni Mountains, this system is still practiced today, and it is named *"in the stubble field"*. Technically speaking, the process consists of the fallowing of a lot, the plowing and its cultivation for three – four years with rye, barley and potatoes – spring crops.

After each harvest, the resulting stubble field was shared by the entire community, either as grazing ground or was left for mowing.

The phenomenon according to the law, of draining the land by losing its natural fertility, remains active, outside the existence of a technical ground able to introduce the potentiating of the quality of the soil by cultural fertility. We emphasize the fact that the practice of fertilization by using fertilizers, was not sufficient, and even more, an over – manuring involved the risk of degradation of the lands by an excessive planting of weeds, ore even worse, by the accumulation of a supplement of toxins at the level of the edaphic shell.

Therefore, the land was left to *"rest"* or in *"lay land"*.

As far as the phases of this cycle are concerned, they are synthesized by the alternation: "lay land – fallow land – stubble field – lay land".

The situation was totally the opposite in the lower regions, with hilly ground and an optimum of pedo-bio-climatic factors. Here, the definitive deforestation of the forest allowed the installation of a steadfast *"fallow land"*, which leads to the apparition of the biennal system of rotation of the agricultural crops. This time we find the estate of the community divided into two fields – *the fallow land and the common* – separated by the so-called *"fence of fallow lands"*. These two categories were destined to take the following paths, the first one to turn into fields used for crops, and the other one was used as joint propriety, as common or as pasture. Every year a change of roles occurred between these two, the purpose being twofold: of "rest" of the soil and of fertilizing – on the side of the borderline destined to be grazing ground.

Dividing the estate into lots, in its ensemble, and their distribution to families, was done by the leaders of the community, according to certain well established standards.

There were, however, situations when the estate of a community, has gone through an intensive exploitation, until the complete depletion of the soil. The only option for the residents remained, in such context, the relocation of the hearth to a new site obtained by the eradication of the forest.

Within the triennial technique, three fields are required, one being left permanently as *fallow* or as a *"black land"*. We mention that this system was characteristic only to Transylvania, its development being taken care of by the impact of the Western influences. Beyond the Carpathians, both in Moldavia (with the exception of Bucovina), and in Muntenia, the system of the three fields takes roots some time later, once with the entering of the capitalist type relationships.

5. FALLOW LAND, PEASANT, RURAL, RUSTICALLY. LINGUISTIC BENCH-MARKS, "COAT OF ARMS" IN THE WORLD OF THE VILLAGE

The socio-economic report, obvious within the rural regions of country type, more conspicuously individualized currently as mental regions, is excellently developed by the pair of appellatives *fallow land - peasant*, where the first term finds its correspondence in the expression "fertile land" and/or "a land worked by the peasant", and the second, denotes "the person who lives in the rural environment and who earns his existence by directly dealing with the cultivation of the land and with the breeding of animals."

Regarding these two components, that are defining for the rural environment: the homeland or the estate – as a support and source of existence and, *the man* – through which the very existence is perpetuated, the peasant entitles, for example, his folkloric dances (manifestations of manhood and joy of living), by using terms from the same family of words, sensitive toward two fundamental egos, his being and the body of the ground. An outstanding example is offered to us by Moților Country (region of the Apuseni Mountains) – through the famous "fallow land", multiplied in particular forms of expression such as: *"the fallow land of the highlanders (mocani)", "the fallow land of the craftsmen who make pots" (văsar), "the fallow land of the miners"* and so on. We emphasize that this folkloric diversity has its origin in the variety of the geographical environmental conditions, decisive on their turn for the structuring of a conglomerate of mental systems, supported by what we would functionally call, the hierarchy of the trades or of "the castes".

A similar folklore circle dance, characterized by its free and casual force, we find in the northern part of Moldavia (Bucovina), where it is simply called "țărăneasca" – *"rustically"*.

Profound connotations are integrated in the folkloric expression such as **"to pay as much as a corner of a country"** = to have a great value; **"the gate of the fallow land"** = gate, or another symbol (cross, triptych, crucifixion, fountain etc.) that marks the entrance into another settlement; **"the fence of the fallow land"** = a fence that surrounds the estate of another village or the property that belongs to a family, or the fence that separated the border line of the village into fields with different agricultural use (example: the arable of common).

From the same linguistic vein another valuable creation emerges, by which the peasant manifests his strong affection and devotion toward his own land and beyond death.

By uttering **"may dust be light to him"** (the equivalent of the English saying **"May God rest his soul"**), during the ritual of burial, with the meaning of "may he rest in peace", a transfer of human personality is performed upon the land, and therefore the land acquires the quality of being alive, of life, not only through labor but through death as well.

In this honest way, human society understands the continuity of existence and of living in a place. Furthermore, they assume, the duty to maintain eternity, as something sacred, by the obligatory going over of "the rituals of reconciliation", known to us as "Winter graybeards", "Spring graybeards", "Summer graybeards"…

6. CONCLUSIONS

From the context of the presented material, but also on a much broader vision upon the traditional Romanian village, obtained both from ethnographic source investigation, and from the survey of the existing collective mentality, and equally, from an ample specialized literature, the following conclusions can be, briefly, drawn out:

- the desacralization of the village in the current context of globalization, implicitly of the atrophying of the spiritual and traditional values;
- the alienation of the "new man" from the "noble" nature of the self and the concomitant entering into a profoundly artificial area by the "disconnecting" regarding with the organic structure of the inhabited space.
- the assuming "of the ignorance" as a natural element of the behavior.

R E F E R E N C E S

1. Bernea, E. (1985), *Cadre ale gândirii populare româneşti*, Edit. Cartea Românească, Bucureşti.
2. Bodiu, A. (2004), *Dorul fără obiect*, Edit. Vremii, Cluj-Napoca.
3. Butură, V. (1978), *Etnografia poporului român,* Edit. Dacia, Cluj-Napoca.
4. Cuceu, I. (1973), *Obiceiuri şi credinţe în legătură cu ocupaţiile tradiţionale la Gârbou, judeţul Sălaj,* în Anuarul Muzeului Etnografic la Transilvaniei pe anii 1971-1973, Cluj-Napoca.
5. Dumézil, G. (1993), *Mit şi epopee,* Edit. Ştiinţifică, Bucureşti.
6. Eliade, M. (1995),*Tratat de istoria religiilor,* Edit. Humanitas, Bucureşti.
7. Fochi, A. (1976), *Datini şi eresuri populare de la sfârşitul secolului al XIX-lea. Răspunsuri la chestionarele lui Nicolae Densuşianu,* Edit. Minerva, Bucureşti.
8. Gaster, M. (1883), *Literatura populară română,* I.G. Heimann, Bucureşti.
9. Ghinoiu, I. (1999), *Calendarul ţăranului român, zile şi mituri,* Edit. Fundaţiei Pro, Bucureşti.
10. Goia, I. A. (1982), *Zona etnografică Meseş*, Edit. Sport-Turism, Bucureşti.

11. Herseni, T. (1977), *Forme străvechi de cultură poporană românească,* Edit. Dacia, Cluj-Napoca.
12. Idu, P. D. (1999), Om şi Natură în Carpaţii Maramureşului şi Bucovinei. Viaţa pastorală, Napoca Star, Cluj-Napoca.
13. Oişteanu, A. (1989), Motive şi semnificaţii mito-simbolice în cultura tradiţională românească, Edit. Minerva, Bucureşti.
14. Puşcaş, Angelica (2007), *Ţara Chioarului. Studiu de geografie regională,* Edit. Presa Universitară Clujană, Cluj-Napoca.
15. Stahl, H. H. (1958, 1959, 1965), *Contribuţii la studiul satelor devălmaşe româneşti,* vol. I, II şi III, Edit. Academiei Române, Bucureşti.
16. Toşa. I., Munteanu, Simona (2003), *Calendarul ţăranului român de la sfârşitul secolului al XIX-lea,* Edit. Media Mira, Cluj-Napoca.
17. Vlăduţiu. I. (1973), Etnografia Românească. Istoric. Cultură materială. Obiceiuri, Bucureşti E.S.

STUDIA UBB GEOGRAPHIA, LVI, 2, 2011

COMPONENTS AND INDICATORS OF VULNERABILITY OF RURAL SETTLEMENTS

V. SOROCOVSCHI[1]

ABSTRACT. – Components and Indicators of Vulnerability of Rural Settlements. The first part of the present paper emphasizes the extrinsic (exposition, elements and vulnerability) and intrinsic components on a rather detailed scale. The vulnerability factors have been categorized on the basis of diverse criteria that took into account the area in which they occur, their role and place in the territorial systems dynamics, their genesis and nature. The intrinsic components category includes the systems resilience, sensitivity, fragility and "preparedness". In the second part of the paper we analyse the criteria that serve as a basis for the separation of the indicators concerning the rural settlements vulnerability. Considering the nature defining the various elements and factors the vulnerability indicators have been included into several classes: spatial, physical, demographic and human, socio-economic and environmental ones.

Keywords: *vulnerability, components, fragility, indicators, rural settlements.*

1. INTRODUCTION

The risk concept includes three terms: danger, vulnerability and exposure. Each of these is related to the three components of the geographical space: nature, man and teritorry. These correspond to the three components of the rural settlements: hearth, population and estate. The main features of vulnerability are the spatial dimension and the dynamic nature, meaning variation in time and space between the periods of extreme crisis and periods of complete stability. Because vulnerability as a risk measure, is relative, the affected ones and the specialists in various fields must accurately establish its thresholds or critical levels.

The main spheres of the vulnerability concept were synthetised by Birkman (2005) as it follows: vulnerability as an inner risk factor (intrinsic vulnerability); vulnerability as the probability of suffering damage (human centered); vulnerability as a dualist approach of susceptibility and resistance capacity; vulnerability as multi-structure: susceptibility, resistance capacity, exposure, adaptation capacity; multi-function vulnerability containing phisical, social, economic, environmental and institutional features.

2. THE COMPONENTS OF VULNERABILITY

Vulnerability is a complex system including a great number of natural and/or human variables, whose dynamics in space and time can lead to more or less dangerous situations for the exposed society. This complex system includes extinsic and intrinsic components.

[1] *Babeş-Bolyai University, Faculty of Geography, 400006, Cluj-Napoca, Romania, e-mail: sorocovschi@geografie.ubbcluj.ro*

2. 1. The extrinsic components of vulnerability

In the category of extrinsic components we can include: exposure, vulnerable elements and vulnerability factors.

2. 1. 1. Exposure and vulnerable elements.

Risk exposure is a fundamental component of vulnerabilty, which together with resilience and sensitivity gives the measure of vulnerability. Depending on the field in which it is used, the term of risk exposure is given different definitions either as a process of estimating and measuring the intensity, frequency and duration of the exposure to a disturbing agent, or as an economic value or a set of elements related to each of the hazards which can happen in a certain region, or even as elements at risk.

Risk exposure depends on certain spatial (distance, affected area) and temporal parameters (the regularity of activities, seasonal habbits) which imply different degrees of vulnerability.

Exposure can be analized on different categories of vulnerable elements; phisical, economical, social environmental.

The vulnerable elements are of social, economic, technical, cultural, esthetic and environmental nature and can be grouped in two main categories: primary (structural) and secondary (non-structural). In the first category are included those elements which are directly exposed to the action of an exteme event (population, buildings, infrastructure, farmlands, animals, utilities). The second category, that of the secondary elemens, includes all the activities and actions which are indirectly affected by the manifestation of a hazard (economical, cultural and educational activities, public service, monuments and natural reservations).

2. 1. 2 Vulnerability factors

In order to define the relationship between risk and the dynamics of the territorial system, the term of risk factors has been introduced (I. Ianoş, 2000). The general factors, which operate in any context, are those of demographic, economical and social nature. One can encounter other factors related to the activities and the ways of land-use, psycho-social, technical, functional, cultural and hystorical, institutional or political-administrative.

The factors that determine vulnerability differ based on the geographical and socio-economical context, on the typology of the analized hazards.

However, there is a series of general factors which can influence the level of vulnerability in any geographical, socio-economical or political context and irrespective of the nature of the analized hazard. The variability of those factors, the relations established between them and their role determine an evolution in time of vulnerability. This fact, together with territorial diversity, supports precise analyses only at the level of a certain system, during a certain time period and regarding a certain hazard. This does not hold back an elementary distinction between the specific factors of vulnerability, related to a certain geographical, socio-economical, political context and to a certain hazard, and the general factors of vulnerability, which can influence the degree of vulnerability irrespective of the context and the nature of the hazard: the level of the existing technical-economic development, the health condition of the individuals or the functionality of a well established social system.

The vulnerability factors can be grouped using various criteria. So, based on the role they hold in the dynamics of the territorial systems the vulnerability factors can be classified into unfavourable (pressure and restrictive) and favourable.

The vulnerability factors can also be classified into structural (technical) factors and non-structural (psycho-sociological, hystorical-cultural, functional, institutional) factors.

Depending on the place they occupy and on their genesis, the vulnerability factors can be classified into primary, derived and secondary, which in their turn include a great many of factors.

The vulnerability factors can also be grouped depending on their nature in several categories:

- the developpment of the rural settlements and the demographic processes represent a first category of factors on which depends the way of occupancy and land using;
- the socio-economical factors are associated to the way of land occupancy and determine the developpment process of the rural settlements in the stages of crisis, post-crisis or economical fluctuations;
- the psycho-sociological factors determine the ways in which the exposed persons observe, live and remember the risk caused by different extreme natural or anthropic phenomena. In this case time is also involved, which on one hand can attenuate and distort the rememberance of the catastrophies, and on the other hand it can determine the routine of living with the risk (accepted risks);
- the hystorical-cultural factors include a series of asects referring to the imposed transculturalisation, to the adoption of certain foreign models without adapting them, to the fatality and resignation related to faith and superstitions (V. Surd et co. 2007)
- technical factors reffer to structural aspects as such: the unapropriate quality of the buildings, the under-dimensioning of the defence works, the absence of the mainaining works, the inadequate placing of some works, the maladjustement of the buldings to the environmental conditions;
- the functional factors reffer to the management of the crisis stage and especially to the operational availability of the techical resources and the quality of the intervention services. This category of factors also include aspects reffering to monitoring, warning and forecasting, which even if don't belong to the crisis stage, influence the vulnerability of the settlements (V. Sorocovschi, 2004);
- the institutional and political-administrative factors are of non-structural nature and reffer to the system that manages resources, to the shortcomings that appear in highlightning the bad performances at the local level, the lack of risk-preventing programs, the lack of a global vision of risks in the intercessions of land planning and in preparing the commanding positions.

Life and property insurance have an important role in the recovering of the rural settlements during the post crisis period.

2. 2. The intrinsic components of vulnerability

In the category of intrinsic components of vunerabilty we can include: resilience, sensitivity, fragility and the capacity of preparing (V. Sorocovschi, 2007).

Resilience is a word of Latin origin (resilio), meaning a coming back to the initial state. It is in reverse proportion to vulnerability. The term was used for the first time in Physics, later in sociology, meaning a property of both natural and social systems to resist a potential stress. In the study of hazards it has been used for the first time by Timmerman (1981), who defined it as the degree in which a system or a part of a system has the capacity to absorb a perurbation and o recover from the manifestation of a hazard. Later Blaike et al. (1994)

define resilience as the ability of an entity to resist or to adapt to a stess caused by the manifestation of a hazard, being a product of the planned degree of preparedness in the perspective of a potential hazard, including the rescue measures.

According to I. Mac and D. Petrea (2003) resilience represents the capacity of the geosistem to maintain its structural and functional integrity in perturbating conditions, together with the speed with which it comes back to equivalent equilibrium conditions by means of asimilating the changes (loss) induced by the perturbations. Resilience has also been defined as the capacity of a system, community or society exposed to hazards to adapt through resistance or chance with the purpose of gaining and maintaining a tolerable level of functioning (UNISDR 2004). The field of the term of resilience is wide includig that of resistance capacity.

Resilience defines the capacity of a systemto neutralize the imbalances appeared by means of risk consuming, the system maintaining its structural-functional characteristics by instrinsical means of self-regulation. These means of self-regulation derive from the quality of the systemic components (natural resources, financial resources, human capital) and the quality and dimension of the interractive relations which ensure its functionality.

From the definitions of the notion of resilience results that in almost all the cases the accent is placed mainly on the capacity of the geosystem to resist and to return to the initial state and less on the suffered structural and functional changes or on the recovering speed.

The atributes of resilience are numerous, but the most sgnificant are: the resistance capacity, the adjustement capacity, the capacity to resist a disaster, the capacity of returning to the initial state of functioning of the geosystem.

The types of resilience have been categorised based on the capacity to resist to change. So Dovers and Handmer (1992), quoted by Klein et al. (2003) distinguished between active and proactive resilience.

Sensitivity was defined as the degree (speed or proportion) in the geosystem or one of its components change related to a stress factor whose sise is determined (I.Mac, D. Petrea, 2003). In other words, sensitivity represents the capacity of a system to modify its atributes and to adapt to a new state of equilibrium, different from the previous one. Sensitivity implies the capacity of the system to gain a new state, to resize the quantitative or qualitative parameters of the composing elements and dy default its functionality in new conditions.

The "sensitive" qualities of the geosystem depend both on intrinsic characteristics (degree of organisation, size) and extrinsic characteristics (the nature and intensity of the pressure put on it. The higher the degree of organisation of a system, the more marked its sensitivity is.

Fragility is a control variable derrived from the association of two fundamental variables. So, fragility comes out of the sensitivity of a geosystem correlated with its resilience, as a reaction to a certain type of perturbation and to its size (Mac, Petrea, 2003). When a high sensitivity is associated with a low resilience the geosystem has a high fragility, being susceptible to suffer major losses after an extreme event.

The degree of preparedness is defined as "the totality of the activities and measures taken in advance in order to ensure effective answers in when a disaster takes place, including insurance policies, warning and temporary evacuation of population and goods in a less threatened place by a potential hazard" (UNISDR, 2001).

There are several approaches of the degree of preparedness, which have been grouped by Kirschenbaum (2002) in three categories: approaches based on attributes (the existence of warning systems, risk awareness), planning scenario, psycho-social processes which underline the personal process of decision-taking. Because there are differences between the degree of preparedness of the community and of the composing individuals it is necesary that the analisys of this component to be developped on a target group.

3. INDICATORS OF THE VULNERABILITY OF RURAL SETTLEMENTS

It is rather difficult to establish all the indicators that intervene in the assessment of the vulnerability of the rural settlements. Several criteria can be use in order to classify the vulnerability of the rural settlements. So, depending on the number of the elements or factors taken into account the indicators of vulnerability can be classified as simple and complex.

Depending on the nature of the elements and factors, the indicators of vulnerability can be included in several categories: spatial, physical, demographic and human, social economic and environmental.

3. 1. Spatial indicators

This category includes the indicators that represent punctual or linear spatial elements or areas and whose distribution can be discreet or continuous. The used indicators can reflect one or more aspects of the territory (position, placement, distance, area, etc)

The position indicators are expressed in geographical coordinates or can be rendered on morphological units or subunits or on intervals of altitude.

Placement can be done in comparison with urban and polarizing centers of different categories, communication ways, important natural elements.

Distance has an important role in the assessment of the effects produced by the extreme events. There is a very close relationship between distance and the intensity of the phenomenon. The distance to which a certain manifestation holds its risk phenomenon character depends on several factors.

The distance to the polarizing centers, important communication ways, is an important indicator in the assessment of the vulnerability of the rural settlements.

The area is an indicator that can show the part of the hearth or/and of the near-by territory where the extreme phenomenon may extend, the forests, etc. Some spatial indicators are obtained by ascribing the vulnerable elements to the area.

3. 2. Physical indicators

The quality of the dwellings and of the dependencies, the existence and the quality of the essential facilities (schools, health centers, hospitals, firemen, police stations), of the communication ways (roads, railways, airways, naval), of the electric, gas, water, telephone networks are expressed by means of physical indicators.

The quality of buildings reflect the physical vulnerability of the analyzed territory. The proportion of the new houses is shown by the edilitary renewal index. When calculating it we take into account the number of inhabitants and the number of houses built during a certain period of time. It is calculated by ascribing the number of houses built during a certain period of time to the current number of inhabitants, according to the following formula:

In = C.100 / P (%), where: In - edilitary renewal index; C - the number of houses built during a certain period of time; P – the current population of the settlement.

Another physical indicator used in the assessment of the vulnerability of rural settlements is the public facilities index.

3. 3. Demographic and human indicators

This category of indicators is of great importance in the assessment of human vulnerability. The most frequently used indicators are:

- *demographic size* is an important indicator frequently used in the assessment of the human vulnerability of rural settlements. Establishing the proper value for every degree of vulnerability has a subjective character, depending on the peculiarities of the settlements in the studied region. Unlike the urban settlements, where the great number of inhabitants show a high degree of vulnerability, for the rural settlements the situation is generally reversed;

- *the population density in the hearth*, meaning the proportion between the number of inhabitants an the area of the settlement, shows the pressure exerted by the population upon the inhabited space. Unlike this indicator, the physiological density shows the number of inhabitants per one hectare of farmland. This indicator shows the pressure exerted by the population upon the farmland, meaning a great part of the near-by territory and much less of the hearth;

- *the feminization index* (the number of women per 100 men) shows the proportion between the number of women and men. Taking into account the specific labors of the primary sector, a higher number of women ascribed to 100 men generally show an averse situation. Because of their make up for women is more difficult to face a natural disaster and they are more disposed to illnesses. (Dana, Goțiu, V. Surdeanu, 2008);

- *the specific feminization index*, for the group of age 15 - 59 shows the process of demographic feminization at the level of the active population;

- *the specific feminization index*, for the group of age over 60 shows complementary the process of demographic feminization;

-*the index of demographic aging* calculated with the formula $I = P \geq 60 / P \leq 14$ shows very precisely the proportion of the population over 60 as compared to the young population

- *the proportion of the young population* out of the total population is also an important indicator in the assessment of the vulnerability of the settlements.

- *the index of age dependency*, obtained out of the formula Id = P (14 – 59 years old) / $P \leq 14 + P \geq 60$, shows very accurately the process of demographic aging.

3. 4. Social-economical indicators

These indicators allow the highlighting of the social and economic peculiarities of the analyzed space. When establishing the social economic indicators one must take into account the fact that the territorial system has two essential components (the natural environment and the human society) which are interdependent and permanently and mutually determine their evolution.

The social indicators must reflect a series of characteristics as such: poverty, underprivileged social groups, instability, the level of education of the population, the essential and useful facilities, the rate of divorces, the rate of crimes, etc.

When assessing the vulnerability of the rural settlements one must take into account the most representative criteria for the analyzed space. In the assessment of the social economic vulnerability of the Transylvanian Plain Ramona Rațiu (2007) considered several indicators: the structure of the active population, the level of education of the population, the type of land-use, the services offered in each habitat unity.

The most frequently used social indicators are those reflecting poverty and underprivileged social groups. Poverty can be absolute or relative, the income level being the main indicator in determining the poverty thresholds.

Besides income indicators there are taken into account those who reflect life conditions as such cultural and social resources involved in accomplishing fundamental human needs (Molnar, 1998). One must also take into account the fact that there have been defined two concepts: poverty and extreme poverty and that the threshold between them has a dynamic character. We can mention the fact that poverty indicators can be included in two separate categories: monetary, regarding population's incomes and non-monetary, reflecting the other aspects of poverty.

The vulnerability induced by the living conditions was appreciated based on three types of indicators (Maria Sandu, D. Bălteanu, 2005) which highlight the access to various facilities (water, electricity, natural gases), over-crowding (the number of persons on inhabiting area) and the safety of living (the proportion of houses built of vulnerable materials out of the total number of houses).

The vulnerability induced by the lack or insufficiency of essential facilities (schools, medical centers, etc) or public facilities (drinking water systems, electricity, natural gases) is highlighted by indicators calculated by ascribing the number of classes to the number of pupils, the length of the above mentioned systems to the number of households.

The vulnerability induced by the lack or insufficiency of medical care can be evaluated by ascribing the number of physicians to 1000 inhabitants, by the infant mortality rate (Maria Sandu, D. Bălteanu, 2005).

The health index was compiled by the aggregation of several indicators: infant mortality, life expectancy, mortality caused by cardiovascular diseases, by cancer (Liliana Dumitrache, Iuliana Armaş, 1998).

Out of the previously exposed facts results the fact that there are numerous partial social indicators, based on which one can calculate the index of community rural poverty, having and integrating character. Also one can draw maps of the distribution of the poorest territorial entities.

The analysis of the distribution of poverty indicators can be completed with that of poverty indicators calculated for different categories of households based on the occupational status of the head of the household (according to the methodology of INS, CASPIS, quoted by Maria Sandu, D. Bălteanu, 2005). This indicator reflect the most accurate the households affected by poverty (unemployed persons, peasants and independent agricultural workers). The TFR indicators calculated based on the size of the household show another image of the distribution of poverty. The indicators calculated for categories of households show higher rates of poverty for the households with children.

The poverty indicators determined for categories of households based on the occupational status and the level of education of the person declared as head of the household, as well as on the number of children and on the size of the household show the density, depth and the greater severity of poverty.

In the category of underprivileged persons or groups (categories) Molnar (1998) includes those situated nearby the threshold of poverty, in danger to become poor because of temporary causes (unemployment, illness) and long-term or permanent causes (a handicap, the belonging to a certain ethnicity, numerous and/or single-parent families).

In the assessment of unemployment two main indicators are used, which allow the quantitative assessment of the impact of the phenomenon upon the rural communities (the general rate of unemployment and the long-term unemployment rate, over 9 months). The two indicators are completed by others: the proportion of the population working in agriculture and in the public sector out of the total working population. The latter indicates the degree of economic dependency on the public sector.

The state of stability or instability of the work-force market reflect quite well the risk of unemployment. The index of stability to the unemployment risk was determined by Liliana Guran and Irina Mocanu (2005) based on several indicators: the rate of variation of the total number of employees in a given period; the proportion if employees involved in risky activities; the proportion of the population occupied in the primary sector; the variation rate of the employees occupied in the first five activities; the degree of certainty of work places in the residence locality and the number of unemployed persons seeking another job.

Out of the above-mentioned economic indicators (the index of human poverty, inflation rate, unemployment rate) one can also mention sector economic indicators, which consider the proportion of the arable land and of the agricultural cultures out of the total area, the degree of dependency on the agricultural activities, the vegetable and animal production ascribed to number of inhabitants, the incomes obtained in the commercial and non-agricultural entities.

3. 5. Environmental indicators

This category includes the indicators that reflect the attributes of the extreme events (intensity, duration, frequency, affected area), the proportion of forests out of the total area of the settlement, the degree of soil degradation, the surface and the type of protected areas etc.

R E F E R E N C E S

1. Alcantara-Ayala, I. (2002), *Geomorphology, natural hazards, vulnerability and preventionof natural disasters in developing countries*, Geomorphology, vol. 47, Issues 2-4, octombrie 2002.
2. Armaş, Iuliana (2005), *Precizări terminologice: hazard, risc, vulnerabilitate*, Terra, anul XXXII – XXXIV (LII – LIV), Bucureşti.
3. Bălteanu D., Alexe Rădița (2001), *Hazarde naturale si antropogene*, Edit. Corint, Bucureşti.
4. Bălteanu, D., Costache, Andra, Tanislav, D. (2003), *Modificările mediului şi vulnerabilitatea aşezărilor umane. Aplicaţii la Subcarpaţii Getici şi Piemontul Getic*, Analele Universităţii Valahia, Seria Geografie, 3, Târgovişte.
5. Bălteanu, D., Şerban, Mihaela (2005), *Modificările globale ale mediului. O evaluare interdisciplinară a incertitudinilor*, Edit. Coresi, Bucureşti.
6. Bălteanu, D., Costache, Andra (2006), *Conceptul de vulnerabilitate. Aplicaţii în geografie*, Revista Geografică, tom 12.
7. Benedek, J. (2002), *Riscurile umane*, Riscuri şi catastrofe, vol. I, Editor Sorocovschi, Vol. V, Edit. Casa Cărţii de Ştiinţă, Cluj-Napoca.
8. Blaikie, P., Cannon, T., Dabis, I. Wisner, B.(1994), *Natural hazards, people's vulnerabilty and disasters*, Routledge, London and New York.
9. Bogdan Octavia (2003), *Riscul de mediu şi metodologia studierii lui. Puncte de vedere,* Riscuri şi catastrofe, vol. II, Editor Sorocovschi, vol.V., Edit. Casa Cărţii de Ştiinţă, Cluj Napoca.
10. Brooks N., Adger W.N., Kelly P.M. (2005), *The determinants of vulnerability and adaptive capacity at the national level and the implications for adaptation*, Global Environmental Change.

11. Cannon, T. (1994), *Vulnerability Analysis and Natural Disasters*, Disasters, Development and Environment Wiley, Ed. Varley, A., West Sussex, UK.
12. Dauphiné A. (2001), *Risque et catastrophes* , Armand Colin, Paris.
13. Dubois-Maur, Jocelyne, Chaline, C. (2002), Les risques urbains, 2e edition, Armand Colin
14. Dumitrache, Liliana, Armaş, Liliana (1998), The health state of the Romanian population during the transitrion period, In GeoJurnal, 44.
15. Erdeli, G, Cucu, V. (2005), *România Populaţie. Aşezări umane. Economie*, Edit. Transversal.
16. Gâştescu P. (1998), *Ecologia aşezărilor umane*, Edit. Universităţii Bucureşti.
17. Goţiu, Dana, Surdeanu, V. (2007), *Evaluarea vulnerabilităţii şi a rezilienţei comunităţilor umane din Ţara Haţegului*, *Riscuri şi catastrofe*, nr. 4, an VI, Editor Sorocovschi, V., Edit. Casa Cărţii de Ştiinţă, Cluj-Napoca.
18. Grecu, Florina (2009), *Hazarde şi riscuri naturale*, Edit. Universitară, Bucureşti.
19. Ianoş, I. (1994), *Riscul în sistemele geografice*, SCC, XLI, Edit. Academiei, Bucureşti.
20. Ianoş, I. (2000), *Sisteme teritoriale. O abordare geografică*, Edit. Tehnică, Bucureşti.
21. Klein J.T. Richard, Nicholls J. Robert, Thomalla Frank (2003), *Resilience to natural hazards: How useful is this concept?*, Environmental Hazards, no. 5, pp. 35 – 45 Elsevier
22. Guran, Liliana, Turnock, D. (2001), *A preliminaryassessement of social risk in România*, Geojurnal, 50
23. Guran-Nica, Liliana, Roznovieţchi, Irina (2002), *Rolul vulnerabilităţii sociale în determinarea "vulnerabilităţii locului". Studiu de caz -Carpaţii şi Subcarpaţii din judeţul Buzău*, Revista Geografică, t. VII
24. Mac, I., Petrea, D. (2002), *Polisemia evenimentelor geografice extreme*, Riscuri şi catastrofe, Vol.I Editor Sorocovschi, V., Edit. Casa Cărţii de Ştiinţă, Cluj-Napoca.
25. Odeh, D.J. (2002), *Natural hazards vulnerability assessment for statewide mitigation planning inRhode Island*, Natural Hazards Review, 3(4).
26. Pigeon, P.(2005), *Geographie critique des risques*, Economica Anthropos, Paris.
27. Raţiu, Ramona Flavia (2007), *Potenţialul socio-economic şi natural în aprecierea vulnerabilităţii aşezărilor rurale din Câmpia Someşană*, *Riscuri şi catastrofe*, nr. 4, an VI, Editor Sorocovschi, V., Edit. Casa Cărţii de Ştiinţă, Cluj-Napoca.
28. Raţiu, Ramona, Sorocovshi, V., Vodă, M.(2009), *Evaluation criteria for the vulnerability of rural settlements,* în Management of Technological Changes, Proceedings of the 6 th Internatioal Conference on Management of Technological Changes, BOOK II, September 3rd-5th, 2009, Vol.II, Alexandroupolis, Greece.
29. Segnestam, L. (2004), *Poverty and Vulnerability to Environmental Stress:Working withMultiple Dimensions of Poverty*. SEI Briefing Note, Poverty and Vulnerability Programme, Stockholm Environment Institute, Stockholm, Suedia, august 2004.
30. Simpson, D.M., Human, R.J. (2008), *Large-scalevulnerability assessments for natural hazards*, Natural Hazards, 47.
31. Sorocovschi, V. (2006), *Categoriile de atribute ce definesc evenimentele extreme. Un punct de vedere*, Riscuri şi catastrofe, nr.3, an V, Editor Sorocovschi, V., Edit. Casa Cărţii de Ştiinţă, Cluj-Napoca.
32. Sorocovschi, V. (2007), *Vulnerabilitatea componentă a riscului. Concept, variabile de control, tipuri şi modele de evaluare*, *Riscuri şicatastrofe*, nr. 4, an VI, Editor Sorocovschi, V., Edit. Casa Cărţii de Ştiinţă, Cluj-Napoca.
33. Sorocovschi, V., Vodă, M., Raţiu Ramona (2008), Characteristics of natural hazards", in Environmental problems and development, Published by WSEAS Press, Bucharest.

34. Sorocovschi, V., Cs. Horvath, S. Bilaşco (2010), *Aspects regarding Somesan Plateau rural settlements demographic vulnerability,* Romanian Review of Regional Studies, vol.VI, nr.2., Edit. Presa Universitară Clujeană, Cluj-Napoca.

35. Surd, V.,Puiu, V., Zotic, V., Moldovan, C. (2007), *Riscul demografic în Munţii Apuseni,* Edit. Presa Universitară Clujeană, Cluj-Napoca.

36. Tanislav, D., Costache, Andra, Murătoreanu, G.(2009), *Vulnerability to natural hazards in Romania,* Studii şi cercetări de geografie şi protecţia mediului, An 8, nr.8.

37. Wisner, B., Blaikie, P., Cannon, T., Davis, I. (2004), *At Risk, Second edition. Natural hazards, people's vulnerability and disasters*, Routledge, London and New York.

38. *** (2003), *Les risques*, Sur la direction de Ivette VEYERT, Edit. Sedes, Paris.

Note: This work was supported by CNCSIS –UEFISCSU, project number PNII – IDEI 2549/2008.

STUDIA UBB GEOGRAPHIA, LVI, 2, 2011

ALGORITHM REGARDING THE TREATMENT OF HIGHLY DISADVANTAGED AREAS FROM ROMANIA

I. IANOŞ[1], J. B. HUMEAU[2]

ABSTRACT. – Algorithm Regarding the Treatment of Highly Disadvantaged Areas from Romania. Entering highly disadvantaged areas into the list of priorities within national and European policies of territorial cohesion represents a necessity. It is considered that, before solving the problem of territorial disparities at national or regional level, it is necessary to solve the problem of the survival of some local peripheral intraregional communities. To that effect, an algorithm for the treatment of the most disadvantaged areas at regional level is proposed. This algorithm is structured into five parts: establishing the institutional framework, setting the diagnostic, analysing the insertion environment, the treatment itself and the post-treatment monitoring. The treatment is likely to be different, depending on the structure of each area, with an accent on the development induced by the localities with a central place function from the inside or outside. The conclusion is that highly disadvantaged areas cannot be developed by means of a "shock" therapy, and the process of treatment can start with the setting of the premises of implementation.

Keywords: *disadvantaged communities, underdevelopment theory, logical scheme of treating underdevelopment, Romania.*

1. INTRODUCTION

Highly disadvantaged areas should maybe represent the most important challenges for regional and county administrations, having in view these are the poorest areas. Moreover, they seem to constitute a major barrier in accomplishing some qualitative leaps within the intraregional development process. Their character of barrier paradoxically arises from the fact they are only resources' provider for developed areas, from which they only require minimal services. Their crystallization capacity of some activities able to valorize the local resources by export is reduced or inexistent. In the context, local development is not possible without an infusion of external capital or without a mobilization of all endogenous energies. This capital's shape is complex, as we frequently speak only about investment flows. Concretely, in some highly disadvantaged areas, with the exception of some punctual interventions at the level of physical infrastructure, it would be enough to efficiently manage local resources by an infusion regarding enterprise culture, an infusion of good practices and elementary education in managing minimal incomes.

[1] *University of Bucharest, Interdisciplinary Centre for Advanced Researches on Territorial Dynamics (CICADIT), e-mail: ianos50@yahoo.com*
[2] *University of Angers, Department of Geography, CARTA, e-mail: jean-baptiste.humeau@wanadoo.fr*

Starting from the researches done in the field (Ianoş, 2000, 2001, 2010; Ianoş and Heller, 2006), the present paper aims at only individualising the necessary steps for local development, by developing the strong points of highly disadvantaged areas. Such a demarche supposes several main stages, among which an important role is played by the accomplishing of a partnership between main administrative units. Without a clear legislation in the field, it is developed the possibility of partnership between these communities and the change of the present indifference into a cooperation based on priority objectives.

2. THE GENERAL CONTEXT, FAVOURABLE OR RESTRICTIVE ELEMENT

Discussing about the modality by which underdevelopment can be diminished at the level of highly disadvantaged areas, during a crisis period, has got a positive side, despite some question marks regarding its realism. In such a stage, the orientation of organisations and public institutions, private or civic, towards the spaces where reality is extremely rigid, can attenuate the effects of the crisis. Up to present, representative institutions in the field are targetted almost exclusively towards territorial areas from a superior level of the hierarchy, by the global development coefficient (Bojnec, 2006).

As recent studies demonstrated, there are big discrepancies regarding development at macro-territorial level (Ianoş, 2010; Lefter and Constantin, 2009; Goschin et all, 2008), and their increase tendencies are indubitable. National space, as essential part of the European space, cannot be regarded but in correlation to this (Toderoiu, 2009). Consequently, it is very obvious that after a period in which the speed of recuperation in the development field is much higher than expected, another period followed, in which initial discrepancies deepened. It is enough to analyse comparatively the GDP per inhabitant in the last three years, in order to notice that, if in the developed countries from the West of Europe the GDP was constant or it slowly increased; in Romania it decreased by approximately 10%. The last statistical data from Eurostat show that in the second trimester of the year 2010, compared to the previous trimester, the GDP at the EU level increased with approximately 2%, whereas in Romania it decreased with 1,5% (Eurostat -Newsrelease indicators, 2010). This means that discrepancies between member states are still increasing, and they are transferring to regional level, too.

The relation between the capital and extreme counties (GDP/inhabitant)

Table 1

The relation between:	**1994**	**2005**	**2008**
Capital/county with minimum value	1,80	4,78	4,76
Capital/most developed county	1,12	1,61	1,48
Most developed county/County with minimum value	1,60	2,97	3,22

Source: processed data.

This increase of discrepancies deepened at Romania's level, too, between developed and less developed regions, and in this respect it is enough to notice that discrepancies between regions in the years 1994, 2005 and 2008 suffered important mutations, the most affected being exactly underdeveloped regions. In order to correctly reveal this aspect, it is enough to show that during the mentioned years, the GDP-inhabitant climbed more rapidly in developed counties and less in poor counties (table 1).

It is thus confirmed that, in the process of territorial development, the convergence of administrative units is reached after the initial increase of discrepancies. In Romania's case, Williamson's curve (1965) is partially examined, showing that territorial discrepancies increase up to a certain level, and when a saturation threshold is reached, its development generalises and discrepancies diminish very much (Szörfi, 2007). We say "partially", as Romania's development level did not exceed the phase of territorial discrepancies' increase, even if the relation between the capital and the other extreme counties proves the reaching of the maximal level and the start of these discrepancies' decrease process. This is a sign by which Pal's affirmation (2009), according to which countries from the east of Europe have got problems regarding regional disparities and their capitals are continuously increasing, seems to be contradicted.

Globally, the territorial convergence process is not visible yet, due to the increase of regional discrepancies between extreme counties. Thus, between the counties Timis and Vaslui, the increase of the existent disparities continues. The difference between the two counties also confirms the increase of the disparities between the west and the east of the country, except for those of core-periphery type (Petrakos, 2009).

In order to reduce these disparities, except for the process of endogenous development of each state, the EU offers, by means of the Structural Funds, substantial financing. This is the reason why it is considered that the main challenge for new EU member states is the efficient absorption of the funds allocated for the territorial convergence objective. This objective is primary in the policy of European cohesion, attracting 81.5% out of the total financing. For the countries which are under this objective, the total amount is of 347 billion Euros (Salmon, 2008). Previous experience shows great difficulties in absorbing these funds, as there is not a sufficiently developed culture to create real mechanisms at different levels, in order to access more easily such a financing and especially to use these funds for creating the bases for the future development. The present Romanian system does not encourage enough the establishment of partnerships between authorities at local, county, regional and central level, on the one hand, and between the public administration, civil society and entrepreneurs, on the other hand (Bischoff and Giosan, 2004).

This general context has multiplying effects upon the development of highly disadvantaged areas' development, but it has also got restrictive effects. Thus, the existence of structural funds would allow local communities from these areas to access financing sources which would solve some of the problems they confront with. Unfortunately, these funds are oriented on axes which limit this access, as, according to the vision of the EU's spatial development, most of these resources will be allocated to the development of the seven national poles and thirteen urban poles of growth. Both categories will absorb approximately 70% out of the funds allocated for Romania by the EU (Government Decision 998/ 2008), meaning that for the rest of the categories of towns, for other types of sectorial investments only 30% will be allocated.

Having in view that a part of the highly disadvantaged areas are situated nearby some national poles or urban centres of growth, a part of the funds allocated for these

growth centres can be directed towards them, by different types of partnerships, with the purpose of increasing the consistency of their supporting space. In such conditions, improvements of the existent legislation impose, and implicitly the adoption of a clear legislation in the domain of territorial partnership.

At the same time, the existence of regional discrepancies and their perpetuation by the development of the 20 territorial growth poles constitutes a major impediment in the treatment of highly disadvantaged areas. Considering them at the periphery of preoccupations connected with territorial development limits the concrete possibilities of local or associative development. Hence it results the limited number of solutions to avoid the process of poverty perpetuation and of creation of social injustice. Because a key element has to be mentioned: the preponderant development of the 20 growth poles will accentuate territorial differences, and these will produce a social territorial stratification, as well as a stratification regarding life quality (Ignasiak-Szulc and Kosiedowski, 2009).

This is the reason why we consider the overall present Romanian and European context is unfavourable for a direct and useful treatment of highly disadvantaged areas. These areas will grow poorer, by internal and external migrations, by the decrease of the demographic potential and by the incapacity of superior development of strong points each of these areas disposes of.

3. THE METHODOLOGY OF ELABORATING AN ALGORITHM OF TREATMENT FOR HIGHLY DISADVANTAGED AREAS

The foundation for individualizing the essential steps such a demarche should follow is to know and to recognize the large diversity of highly disadvantaged areas. Such an algorithm supposes to know the internal structure of each area, to build some structural models and to extrapolate them for similar regional environments. The fundamental idea to start from is that inefficiency of progress with regard to such areas' development results from the lack of some local or inter-local policies of developing strong points and eliminating some of the problems they confront with. It is supposed that providing an algorithm for te tratement of highly disadvantaged areas will diminish the tendencies of territorial exclusion and will bring back the disparity as regards the development between these and insertion spaces.

The work hypothesis is that the algorithm for the territorial treatment of highly disadvantaged areas respects the rules of a logical chart, where the stages' succession has got finality. Thus, this algorithm will be the main instrument for implementing the development policies of a highly disadvantaged area.

The algorithm's structure includes the following stages: diagnosis, treatment and post-treatment monitoring, inclusively the additional treatment. As it is about a long term treatment, the instruments and the doses applied will imply changes, depending on the state of the respective area, as well as on the context of territorial insertion.

The entry data used in elaborating this algorithm were extracted from the concrete analyses carried on for all highly disadvantaged areas from the country and refined depending on some similar studies unfolded for the general management of some territorial entities.

4. THE PRESENTATION OF THE TREATMENT ALGORITHM

The territorial individualizing of highly disadvantaged areas, taking into account the specific criteria of such entities, supposes, implicitly, that we are in front of some areas with special problems regarding the development level. Yet this individualization does not offer, in a regional context, enough elements for also revealing the problems they confront with. Therefore, for a transition country, characterized by a high degree of rurality, amplified by the fact that most of the towns are small, with pregnant rural characteristics, it is important to build and apply a chart of approaching intense underdevelopment. The means of approach correlate with the particularity of highly disadvantaged areas, but for underdevelopment treatment there is the same logic, structured on the following stages:

A. Establishing the institutional framework for the implementation of the process of highly disadvantaged areas' treatment. In order to ensure the success of the underdevelopment treatment process, it is necessary to establish the framework in which the assessment of the present state of the respective area will take place, as well as the entire suite of specific measures for the suitable treatment. Building this framework is, despite appearance, extremely difficult, due to the political diversity of the decision factors, low level of the population's initiation and the distrust existent at this stage. This is the reason why involving some specialists and the civil society supposes:

a) *present decision factors should be aware*, from the level of elementary structures, of the importance of cooperation within the individualized area, in order to cope with the problems related to the future development of communities;

b) *the diffusion, within local communities,* of disadvantages of cooperation between all communes and, possibly, the towns from the analyzed area, by the use of some forms and of a suitable language. Communities may exert pressures upon decision factors in order to identify some efficient cooperation forms;

c) *establishing trust between decision factors,* beginning at some mayors' initiative (or of all the mayors) and as a result, a cooperation agreement should be signed, within which the strategy of cooperation and the ways of constituting the institutional framework should be defined;

d) *establishing an inter-communal team,* charged with elaborating and proposing a statute of the association of communes from the highly disadvantaged area. Specialists, representatives of communities from different scientific or administrative organisms at regional or national level will be part of this team, together with other local representatives;

e) *adopting a Charter of inter-communal development,* where the main elements of strategic and political nature of communities should be mentioned;

f) *building the Inter-Communal Association for Development,* implying the agreement of all communities for the constitution of such an institutional framework and its recording as an institution with legal personality;

g) *establishing the Council for inter-communal development,* aimed to put together the communes' mayors, representatives of business environment, schools, cults, as well as other civic organisations. The number of members and their statute will be established by popular consultation;

h) *the foundation of the Agency for inter-communal cooperation,* with an executive role in the process of implementation of the strategies and policies established by the Association, as well as in managing the projects related to territorial development;

i) *the foundation of the Fund for inter-communal cooperation,* having as sources the quotum for each commune, governmental and regional sources, external sources, contributions of some enterprises or commercial societies, donations etc.

B. The application of the diagnostic on the highly disadvantaged areas. The diagnostic is essential for the individualising of disfunctionalities, distorsions, weak and strong points of the analysed territorial entity. In this respect, it is recommended to combine the sectorial analysis with a SWOT-type analysis, which could reveal the characteristics of the internal and external environment:

a) *establishing the system of indicators for the refinement of information* obtained as a result of intraregional disparities' analysis. When individualising highly disadvantaged areas, comparative analyses were done at the level of elementary territorial entities of the region. Other indicators, obtained by surveys carried on at the population's level, must be added to these, with the purpose of measuring the main characteristics of the respective area's development;

b) *the determination of the complex hierarchy of communes* inside the analysed area. By the aggregation of new indicators obtained, the development level of communes will be measured, establishing their hierarchy. By means of the inclusion of some indicators identifying the relationships between settlements, there will be made appreciations regarding the possible central place of a locality in relation to the entire area or parts of this area;

c) *the analysis of the area's internal state,* using specific indicators for the demography, economy, infrastructure and prosperity's level. The main characteristics of the analysed area are revealed, as follows: the way of using soils, the processes of concentration-deconcentration of population and resources, and the stage of economic restructuring:

- the evaluation of the internal state also supposes tracking the main disfunctionalities, the obstruction or amplification points in the territorial development process;
- the application of the SWOT analysis will be done only for the characterisation of the internal environment, respectively for emphasizing weak and strong points;

d) *the diagnostic's application,* by the classification of the main problems contoured around weak points or in relation to the existence of some strong points insufficiently developed. Identifying and placing these problems depending on their importance, within the present level of development, which is very low, constitutes the key element of diagnosing the internal state of the highly disadvantaged area.

C. The analysis of the highly disadvantaged area's insertion environment. None of these areas is isolated in the territory, but it is within a sub-regional and regional environment which it interacts with. In relation to other areas, this area is a real pray, as by the resources it possess, it is directly or indirectly assaulted, by large or medium sized urban centres, situated in the region or country they belong to. A special case is that of the massive migration of work power from these areas abroad, in other EU countries, especially in the conditions of the encouragement of this phenomenon. The analysis of the insertion environment supposes:

a) *the evaluation of road and rail connections with the insertion space.* It is not only about the existence of physical infrastructures, but also about the intensity of flows between this area and its neighbourhood;

b) *the estimation of functional connections between the area's settlements and the neighbouring polarizing centres.* The analysis of flows and their orientation may lead to the individualizing of some local settlements systems, to which some localities from the highly disadvantaged area may belong to;

c) *the individualizing of localities with a central place function from outside of the area.* For the approach in a systemic context of the underdevelopment level registered, it is important to find some urban or rural active centres from outside of the respective area, which might induce development in the perspective of a complex process of re-launch of the economic growth;

d) *the analysis of the external environment in terms of the SWOT analysis.* This implies to find and underline the relevance, for the analysed area, of opportunities and threats regarding future development. In this respect, there are identified the ways by which these components may constitute favourable or restrictive elements for the implementation of some policies of inter-local economical-social revitalization;

e) *identifying the compatibilities which arise from the characteristics of the insertion environment*. The integrated territorial development supposes an increasing compatibility between underdeveloped areas and their insertion environments, by the use of complementarities and by the decrease of present discrepancies.

D. The applying of the suitable treatment. The specific of each area imposes to adopt a set of measures in relation to the factors which generate poverty, with the communities' options and with the insertion environment's features. These form the nucleus of some global policies of diminishing underdevelopment, and on that account their implementation represents the key element. The treatment of a highly disadvantaged area can be done distinctively in relation with three major characteristics of the highly disadvantaged area:

- the homogeneity of the very low development level and the lack of an internal centre, able to take over the central place functions;
- the heterogeneous character of the development level, determined by the existence of a mono-, bi- or multi-polar structure, depending on the local centres, which might play the role of some development engines at the area's level;
- the internal complexity of the area and of the area's context of insertion, which makes the development process, be endogenously dominant for certain segments and exogenously dominant for other segments.

The main individualized steps in an implement treatment procedure are:

a) *the evaluation of financial resources it can be counted on*. Any intervention in the acceleration of the development process needs funds. Consequently, in the treatment process there must be known exactly which the values of the resources to be invested are. In these situations, the direction of endogenous development can be followed, the communities counting on their own resources and on the citizens' solidarity;

b) *carrying on a campaign for cultivating the solidarity sentiment* at the level of ordinary population from the disadvantaged area. In this respect, the promoters' credibility is essential for creating some internal synergies able to initiate a new type of development;

c) *choosing the type of treatment in relation to the specific of the area*;

The treatment of each area, and especially of extended areas, can be done only by the aware creation of some discontinuities as regards development:

- in case of the areas where underdevelopment's homogeneity dominates, there are two ways of attenuating it. The first is that in which discontinuity is produced in the inside, and the development is to be diffused towards the periphery. This must be based on several simulations related to the changes which might appear at the level of the other communes, by impelling one

or two local centres of power. The second is that which pushes discontinuities towards the interior of the area, up to elimination, under the influence of the development induced by centres from the outside. In other words, in the first case we discuss about a development prevailingly endogenous, and in the second case, about a development prevailingly exogenous;

- in case of the mono-, bi- or multi-polar highly disadvantaged areas, the development paths are based on internal processes of diffusion. It is generally discussed about extended areas, with one or several localities with a central place function. From here it results a process of attenuating territorial discrepancies, by their growth, firstly. In both cases, the bet is represented by a dominant development of an endogenous type, with the generation of local discontinuities and their transfer towards the exterior, covering the entire area;

- in case of highly disadvantaged areas with a complex structure and where the ways of attenuating underdevelopment are different, a combination of endogenous development with the exogenous development is generally met. Endogenous development has in view the diffusion of development from one centre towards a side of the studied area, and exogenous development has in view to attract the other side within the process of development, under the influence of some external centres;

d) *the elaboration of inter-communal cooperation programs*. Starting from the observed reality, the association establishes a short-term, middle-term and long term strategy, accompanied by pertinent cooperation programs. These will be sustained by projects, out of which a part will be elaborated by voluntary work, having in view the limited financial resources. There are of high importance especially the projects referring to education, the formation of an enterprise culture, the way of increasing incomes by a pertinent management of minimal family resources, the cultivation of solidarity etc. These projects ensure the necessary premises for a sustainable, aware development of communities. Another part of the projects, with amplification effects, will be based on the existent financing, envisaging key sectors for economic growth and for the diminution of underdevelopment. By means of local stimuli, inclusively by different fiscal facilities, the investments' efficiency and small entrepreneurs' encouraging will be ensured. The structure of inter-communal cooperation programs will be balanced, envisaging the attraction of some investors from the neighbouring areas, too;

e) the implementation of inter-communal cooperation programs will have in view the selection of projects of large interest and viable for local communities, encouraging local partnership between the development's actors. The diffusion of good practices as regards the association of fields' owners, the capitalization of agricultural activities and other traditional activities (hand-made, touristic) from a commune to another can ensure beneficent effects upon the state of inhabitants' life quality.

E. Post-treatment monitoring, as a sustainability source of the effects of diminution of poverty degree. Treating a highly disadvantaged area is a long duration process, which may last a generation. The poorest areas are always on the last position on a priority list, especially in the transition countries. On the one hand, these are peripheral and are considered to be resources consumer, and on the other hand they do not have the power to become a problem for the state or for the European Union, as they are de-structured, with an aged rural population, preoccupied only by survival. From these reasons, in our opinion, post-treatment monitoring must be regarded as a long treatment, as it cannot be spoken about a "shock-treatment" of highly disadvantaged areas. In this respect, post-treatment monitoring implies:

a) *following the way of using financial funds and resources allocated for different types of projects*. This is an action which gives confidence to communities and socio-economical actors within the program of inter-communal cooperation. Transparency along the treatment process itself consolidates solidarity and internal cohesion of the Association;

b) *early evaluation of the efficiency of the inter-communal cooperation program.* The yearly report the Inter-communal Cooperation Council will elaborate will be public and it will be analyzed within local communities, in order to correct some measures and to reconsider some priorities. It will be insisted on underlying the progress registered in the field of inter-communal development, inclusively of the facilities related to the increase of the life level at the households' level.

5. CONCLUSIONS

The treatment of highly disadvantaged areas, despite its peripheral character, represents a priority for a self-respecting state. The affiliation to the European Union and the primary objective of attenuating the discrepancies between developed and less developed countries do not impede the states from the second category not to pay attention to geographical areas in which communities struggle for survival. If we speak about the chance equality, equity and social inclusion, at the European Union's level, then the attenuation of continental discrepancies must be subsequent to ensuring the minimum standard of life for all communities.

In this spirit, highly disadvantaged areas would become a priority, and their treatment should begin before eliminating the big territorial disparities. European and national policies in the field of territorial cohesion should include a distinct segment for these areas, which could become European problems, by their multitude and persistence.

This complex context determined us to propose a perfectible algorithm of treatment for the less developed areas from Europe, strongly affected by the regressive tendency registered as regards development. From this algorithm it comes out that the treatment is specific for each area, its implementation follows a sustainable development and a period of pre-treatment is necessary, in which the premises of its implementation are built. Taking into account the specific of such areas, the application of a "shock" therapy is excluded, as the treatment's solutions become compatible in time, together with the changes stepped in the inhabitants' and local decision factors' mentality, in the behaviour of the socio-economical and cultural actors.

ACKNOWLEDGEMENTS. This paper is the result of research contract "Controlled Production of Discontinuities and the Treatment of the Most Disadvantaged Areas", Grant number 194/2007, supported by National Council for Higher Education Scientific Research (CNCSIS).

R E F E R E N C E S

1. Bojnec, S. (2006), *Regional and structural policies in less favoured and cross-border areas – An example from Slovenia,* Jahrbuch des Österreichischen Gesellschaft für Agrarökonomie.

2. Brischoll, C., Giosan, V. (2004), *Regional Development and Descentralisation in Romania: Connecting the Dots,* in: Challenge of Regional Development in South East Europe: Strategies for Financing and Service Delivery.
3. Hüber, P. (2006), *Regional Labor Market Developments in Transition*, Work Bank Policy Research, Working Paper, 3896, April.
4. Ianoş, I. (2000), *Less favoured areas and regional development in Romania*, in ed. Horvath, G. "Regions and Cities in the Global World", Essays in Honour of Gyorgy Enyedi, Centre for Regional Studies, HAS, Pecs.
5. Ianoş, I. (2001), *Highly disadvantaged areas from Romania. Preliminary considerations,* Terra, 1-2.
6. Ianoş, I. (2010), *Spatial Pattern of Romania's Uneven Development*, Revista Română de Geografie Politică (Romanian Review on Political Geography, XII, 1.
7. Ianoş, I., Heller, W. (2006), *Space, economy and settlements systems*, Edit. Tehnică, Bucureşti.
8. Ignasiak-Szulc A., Kosiedowski, W. (2009), *Between Europe and Russia: Problems of development of North-Eastern Borderland of the European Union*, Materialy z seminarium, 15-16 czerwca 2007 r., Torun – Streszcz. pol., ros.przy ref. Wstep, zakonczenie i spis tresci takze pol., ros Tyt. Rownol. Takze ros.
9. Lefter, C., Constantin, C. (2009), *Economic and Social Disparities of Romania in Regional and County Profile,* Management & Marketing, 4, 1.
10. Pal, S. (2009), *Changing Spatial Structures of East Central European Countries*, 3rd Central European Conference in Regional Science – CERS.
11. Salmon, K. (2008), *New Directions in European Regional Policy and their Implications for Spain,* Investigaciones Regionales, Section Politica Regional Europaea, 12.
12. Szörfy, B (2007), *Development and Regional Disparities – Testing the Williamson Curve Hypothesis in the European Union*, Focus, 2.
13. Toderoiu, F (2009), *Real Economic Convergence – European and National Dimensions,* Agricultural Economics and Rural Development, New Series, VI, 2.
14. Williamson, J.G. (1965), *Regional inequality and the process of national development: a description of the patterns*, Economic and Cultural Change, 13.

STUDIA UBB GEOGRAPHIA, LVI, 2, 2011

THE EVOLUTION OF ADMINISTRATIVE ORGANIZATION IN WALES. CASE STUDY: THE FORMER GLYNDŴR DISTRICT

R. RUSU[1]

ABSTRACT. - The Evolution of Administrative Organization in Wales. Case Study: The Former Glyndŵr District. The paper highlights the most important moments in the evolution of local government in Wales, providing examples mostly from North-East Wales, and specifically the area of the former Glyndŵr District, which underwent spectacular changes throughout the time. During the Middle Ages, Wales was formed by a number of petty kingdoms, further divided into cantrefi and commotes. After the Act of Union (1536), the English system of counties was implemented. They comprised a number of hundreds. The parishes were the smallest divisions. The first modern administrative reform came with the Local Government Act of 1888, which established the administrative counties, divided into urban and rural districts. Further reforms were enacted by the Local Government Acts of 1894 and 1929. However, the most radical changes took place with the Local Government Act of 1972 (enforced in 1974), which reduced the number of counties from 13 to 8 and the number of districts from 116 to 37. Civil parishes changed their name into communities and were allowed to have a council. The two-tier system came to an end in 1996, when the counties and districts were replaced by 22 unitary authorities (or principal areas, styled either "counties" or "county boroughs") as a result of the enforcement of the Local Government (Wales) Act of 1994. Boundary changes occurred even after this date, for instance in the Vale of Llangollen, disputed between Denbighshire County and Wrexham County Borough. Boundary issues are reviewed by the Boundary Commission for Wales.

Keywords: *Wales, local government, Glyndŵr District, county, administrative organization.*

1. TERRITORIAL DIVISIONS OF MEDIEVAL WALES

In Early Medieval times, Wales was divided into a number of small kingdoms, which became larger throughout the centuries and disputed lands (J. Davies, 1994). In North Wales, the two main kingdoms were Gwynedd (in north-west) and Powys (in east-central Wales). One of the territories they disputed was Perfeddwlad ("the middle country"), also known as Gwynedd is Conwy or Lower Gwynedd, the area between the Conwy and the Dee estuary in north-east Wales, whose southern half was later comprised in the Glyndŵr District (Wendy Davies, 1982).

They were further divided into *cantrefi*. The Welsh word come from "can" (a hundred) and "tref" (villages), therefore literally meaning "a hundred villages". In early times, the *cantref* may have actually included a hundred or so villages; however, the original territorial significance changed and they varied in size (Wendy Davies, 1982). The term is similar to the Anglo-Saxon

[1] *Babeş-Bolyai University, Faculty of Geography, 400006, 5-7 Clinicilor Street, Cluj Napoca, Romania, e-mail: rrusu@geografie.ubbcluj.ro*

division named "hundred" and this term replaced the *cantref* after the conquest of Wales without changing much of the meaning or territory covered by them. The seat of a cantref was in a larger village or town, called *maerdref* (like Denbigh, for instance). The *cantref* was in its turn divided into smaller units, *cwmwd* (singular) or *cymydau* (plural) in Welsh, or commote (in English). A *cantref* may have consisted of several commotes (Wendy Davies, 1982). In late medieval times, commotes became more important territorial divisions than the *cantrefi*, as lordships tended to replace the latter. They were both used for legal purposes.

In Perfeddwlad, an important *cantref* was, for instance, Dyffryn Clwyd, which covered the upper part of the Vale of Clwyd basin and the surrounding hills. Before the Edwardian conquest of Wales in 1282-1283, it was divided into the commotes of Dogfeiling (in the east), Llanerch (in the south) and Colion (in the west). After the conquest, the *cantref* was transformed into the marcher lordship of Ruthin (J. Davies, 1994). Its neighbour to the north had been the *cantref* of Rhufoniog, in itself divided in commotes like Cymeirch, Is-Aled and Uwch-Aled. Together with the *cantref* of Rhos, it formed the marcher lordship of Denbigh after 1282 (R. Newcome, 1829).

Before 1282, in the southern half of the modern Glyndŵr District, the petty kingdom of Powys Fadog (Lower Powys) included the *cantrefi* of Y Rhiw, Y Barwn, Trefred and Raider, among others. Y Rwiw included the commote of Iâl (on Alyn and Afon Morwinion), Trefred – the commote of Chirk, Raider – the commotes of Nanheudwy (mainly on the Vale of Llangollen and the lower Ceiriog), Cynllaith (on the upper Ceiriog, the Cynllaith valley and in the Berwyn area) and Lower Mochnant (on the lower Tanat valley and its tributaries). After the conquest, they shared the same fate as their northern counterparts and were broken up into marcher lordships (Dorothy Sylvester, 1969). The princely family of Powys Fadog was pardoned and granted the small estate of Glyndyfrdwy and Cynllaith Owain; the Welsh hero Owain Glyndŵr was a member of this family (J. Davies, 1994). The cantref of Y Barwn, including the commotes of Edeirnion, Dinmael and Glyndyfrdwy, was the only one which did not become a marcher lordship and was included in the county of Merionethshire.

2. TERRITORIAL DIVISIONS UNTIL THE END OF THE 19TH CENTURY

After the Act of Union of 1536, the English "shire" system was implemented in all Wales, leading to the creation of counties which replaced the marcher lordships. The territory of the district was then included in the county of Denbighshire, except for the south-west (Edeirnion), which remained part of Merionethshire.

Counties were further divided into hundreds, and larger settlements (such as Denbigh and Ruthin) received the status of "borough" (J. Williams, 1856). Each county had the right to send one member to the Parliament, and usually a second member was sent from a borough of that county. Merionethshire had no borough and therefore had only one MP (P. Jenkins, 1992).

The hundreds largely respected the former *cantrefs* or sometimes commotes, varying in size. In the Vale of Clwyd, Rhuthun hundred corresponded to the former *cantref* of Dyffryn Clwyd while Isaled hundred (around Denbigh) covered the area of former Cymeirch and Is-Aled commotes. They also comprised the catchment area of Clwyd River in the Hiraethog Hills.

To the South, the Yale hundred inherited the former Iâl commote, while Chirk hundred covered the ancient Chirk, Nanheudwy, Cynllaith and Lower Mochnant commotes (R. Millward, A. Robinson, 1971, Margaret Mahler, 1912).

The smallest division in Wales was the parish, which at the time was an ecclesiastical unit. Initially, the parishes belonged to the Catholic Church, and after the Reformation, to the Church of England. Nevertheless, apart from their spiritual role, the parishes were also used for administrative purposes. For instance, the parish had to look after the poor, who had formerly been in the care of monasteries (before their dissolution).

There were little changes until the 19th century, when Poor Law Unions were established by the Poor Law Amendment Act in 1834. These "unions" were in practice territorial divisions. Initially they were used to look after the poor, but then for other purposes, too (P. Jenkins, 1992). For instance, registration districts were created in 1837 and sanitary districts in 1875, on the basis of Poor Law Unions. They were further divided into sub-districts. For instance, Ruthin Registration District had six sub-districts: Llanarmon, Ruthin, Llanelidan, Gyffyliog, Llanrhaiadr and Llandyrnog. Denbigh sub-district was included in St. Asaph Registration District (M. Richards, 1969).

The limits of Unions (and therefore of Registration Districts) did not take necessarily into account the limits of the counties, and even less those of the hundreds. For example, Corwen Union (and Registration District), then in Merionethshire, included the Vale of Llangollen and the lower Ceiriog valley, then in Denbighshire. Oswestry Union (of the English county of Shropshire) included the Welsh parishes of Chirk and Llansilin. Llanfyllin Union, based in Montgomeryshire, also comprised the Denbighshire parishes of Llanrhaeadr-ym-Mochnant, Llangedwyn, Llanarmon Mynydd Mawr and Llangadwaladr (M. Richards, 1969).

The boroughs, including Ruthin and Denbigh, were reformed under the Municipal Corporations Act of 1835 (H. Carter, 1966). The act established that the boroughs would be governed by a town council, elected by ratepayers.

3. THE CREATION OF ADMINISTRATIVE COUNTIES AND DISTRICTS

A major change came with the Local Government Act of 1888, enforced since April 1, 1889, although the counties remained geographically the same. Inspired from the town councils, the act stipulated the creation of elected county councils, which took over the administrative functions of the magistrates of the Quarter Sessions courts (P. Jenkins, 1992). The counties thus became "administrative counties", as provided by the law. Large cities (in Wales, only Cardiff and Swansea) were also given county status and were denominated "county boroughs".

Further reform was carried on with the Local Government Act of 1894, which established that urban and rural districts should form the second tier of local government together with the already existing municipal boroughs. Their territory largely coincided with the sanitary districts and they had elected district councils. As the sanitary districts had been in their turn established on the territorial base of poor law unions, which sometimes crossed county boundaries, the act specifically requested for the division of such districts, so that no district would cross the county boundary. With the creation of districts, the previous divisions, such as hundreds, poor law unions or registration districts, became obsolete.

Denbighshire consisted of the rural districts of Ruthin, St. Asaph, Llangollen, Llanrwst, Chirk, Llansilin, Uwchaled, Wrexham and Conway, the urban districts of Abergele and Pensarn, Colwyn Bay, Llangollen and Llanrwst, and the municipal boroughs (also considered as "urban districts") of Ruthin, Denbigh and Wrexham (M. Richards, 1969). Therefore, the act recognized the "urban" character (the town status) of those parishes which were the core of urban districts, apart from the already statutory boroughs.

In Merionethshire, the Edeirnion Rural District inherited the ancient homonymous hundred and a part of Corwen Union.

At local level, the parishes were transformed into "civil parishes" and recognized as the basic administrative unit. Henceforward they also had a parish council (if they had at least 300 inhabitants) and no longer corresponded necessarily with the ecclesiastical parishes. For instance, parishes which had previously extended into two counties or two districts were split into two civil parishes, although the ecclesiastical parish remained the same. For instance, the parish of Llanynys, near Ruthin, was split into "Llanynys Rural" and "Llanynys Urban".

Nevertheless, ecclesiastical parishes continued to exist and most of them still corresponded to the civil parishes. However, after the establishment of the Church in Wales in 1920, they suffered changes in their turn, and further mergers, dissolutions and divisions of both ecclesiastical and civil parishes led to visible differences between these units (G.H. Jenkins, 2007).

The Local Government Act of 1929 formally put an end to Poor Law Unions and made provisions for the review of districts in each administrative county of England and Wales, in order to establish more effective areas for administrative purposes. As a result, in the following years, the number of both urban and rural districts decreased significantly.

In Denbighshire, the County Review Order was issued in 1935 and determined the creation of Ceiriog Rural District by merging the former Chirk and Llansilin districts; the Aled Rural District out of (mainly) St. Asaph former district; the Hiraethog Rural District from the previous Llanrwst and Uwchaled districts, and a part of Ruthin Rural District; and it abolished Llangollen Rural District, whose parishes were distributed between Wrexham and Ruthin rural districts (M. Richards, 1969). The urban districts and municipal boroughs remained the same, with only minor changes regarding their extension. Edeirnion Rural District in Merionethshire was also unaffected.

Further reform was made at the parish level, with the aim of reducing the number of civil parishes. The parishes which had been previously divided into "urban" and "rural" parts were most affected. For instance, all the "urban" parishes of Llanfwrog, Llanynys, Llanrhydd and Llanfair Dyffryn Clwyd, part of Ruthin Municipal Borough (Urban District), were abolished and merged with the civil parish of Ruthin (M. Richards, 1969). The town tripled its population as a result of this change and actually became identical to its urban district. Other parishes were just too small and merged with neighbouring larger parishes.

4. THE LOCAL GOVERNMENT REFORMS OF 1974

World War II postponed other reforms to the administrative system, but the issue was reconsidered again starting with the 1950s. After centuries of preserving the ancient counties, the government finally agreed that changes were absolutely necessary. In Wales, even more than in England, counties which developed heavily during and after the Industrial Revolution, such as Glamorgan, that concentrated about one million inhabitants, were considered of the same importance as rural counties, such as Radnorshire, with a population below 20,000 (R. Rusu, 2000).

In 1956 and 1957 three White Papers were published, followed by the Local Government Act of 1958. The Act stipulated the establishment of a Local Government Commission for Wales to review the areas and functions of local authorities. The Commission submitted its draft proposals in 1961 and presented its final report in 1963, recommending a reduction of counties from 13 to 7, and few other changes regarding the county boroughs. The government

did not accept the proposals and an inter-departmental working group was set up in 1965 to tackle the issue. As a result, a White Paper was produced in 1967, incorporating some of the previous proposals. However, the number of "administrative areas" would be reduced to 5, further divided into 36 districts, while the county boroughs of Cardiff, Swansea and Newport would continue (B. Wood, 1976).

The Secretary of State, George Thomas, announced changes to the proposals in November 1968. For the first time, a division between a "North West Wales County" and a "North East Wales County" was proposed, including a readjustment of the Caernarvonshire - Denbighshire boundary and the separation of Edeirnion district from Merionethshire. Plans were further reconsidered for the whole Wales, at the same time as in England, and a White Paper was published in 1970, proposing three unitary authorities in South Wales, based on Cardiff, Swansea and Newport (B. Wood, 1976). The new Conservative government issued a Consultative Document in 1971, further dividing Glamorgan (South Wales), but without other significant changes to the Labour proposals of 1968.

Eventually, the proposals were included in a Bill, which was sanctioned by the British Parliament as the Local Government Act of 1972. The Act put an end to the 13 ancient administrative counties of Wales and created 8 new counties, while the number of districts decreased from 116 to only 37 (H. Carter, H.M. Griffiths, 1980). There was no longer any distinction between "rural" and "urban" districts. The Act came into force on April 1, 1974.

Apart from Glamorgan, all new counties received Welsh names with no English equivalent, a proof of the rising awareness of the importance of Welsh language and traditions (R. Rusu, 2000). Most of the districts were also given Welsh names.

Although called "two-tier", the system was indeed three-tier, as it retained the civil parishes at the bottom of the administrative pyramid. In Wales, the civil parishes were renamed "communities" and had the right to have a community council, although this was not compulsory. The towns also preserved their status and therefore their governing bodies were called town councils.

In North-East Wales, the new county of Clwyd included former Flintshire, most of former Denbighshire and Edeirnion district of Merionethshire. It included six districts: Colwyn, Rhuddlan, Alyn and Deeside, Delyn, Wrexham Maelor and Glyndŵr (J. May, 1994). Glyndŵr District, named after the Welsh hero Owain Glyndŵr, was the largest one in terms of area, but the least populous, as it was located in the rural inner parts of Wales, resembling more to central Wales than to North-East Wales. It included the former Denbighshire rural districts of Ceiriog, Ruthin and parts of Wrexham, as well as the urban districts of Denbigh, Ruthin and Llangollen, along with the former Edeirnion rural district of Merionethshire.

Unlike England, where civil parishes do not cover the entire territory, the Welsh communities cover the entire area of Wales. The communities also underwent changes. Some of them were enlarged or reduced their area. Smaller communities even disappeared, as they were included in the neighbouring larger communities. This was the case of Llansanffraid Glyndyfrdwy on the Dee Valley, Llanarmon Mynydd Mawr and Llangadwaladr in the Berwyns. The community of Llanrhaeadr-ym-Mochnant was oddly split between Glyndŵr District (Clwyd) and Montgomery District (Powys).

A still existing Local Government Boundary Commission for Wales was also established in 1974, to keep under review all local government areas of Wales.

5. THE PRESENT ADMINISTRATIVE ORGANIZATION

However, this two-tier system also met a lot of criticism and the desire for unitary authorities all over the United Kingdom reached its momentum at the beginning of the 1990s (J. Davies, 1994). In 1991, the Secretary of State for Wales, David Hunt, published a consultation paper on the reform of local government. It proposed the replacement of the two-tier system of counties and districts with unitary authorities, in number of 10, 20 or 24. In 1992, the Secretary of State for Wales stated the number of proposed unitary authorities was 23.

Communities of the former Glyndŵr District

Table 1

Community / location	Geographical location	Administrative location – county (before 1974)	Administrative location – unitary authority (after 1996)
Aberwheeler (Waen)	Vale of Clwyd	Denbighshire	Denbighshire County
Betws Gwerfil Goch	Hiraethog Hills	Merionethshire	Denbighshire County
Bryneglwys	Ial	Merionethshire	Denbighshire County
Ceiriog Ucha	Ceiriog Valley	Denbighshire	Wrexham County Borough
Chirk	Ceiriog Valley	Denbighshire	Wrexham County Borough
Clocaenog	Hiraethog Hills	Denbighshire	Denbighshire County
Corwen	Dee Valley	Merionethshire	Denbighshire County
Cyffylliog	Hiraethog Hills	Denbighshire	Denbighshire County
Cynwyd	Dee Valley	Merionethshire	Denbighshire County
Denbigh	Vale of Clwyd	Denbighshire	Denbighshire County
Derwen	Hiraethog Hills	Denbighshire	Denbighshire County
Efenechtyd	Vale of Clwyd	Denbighshire	Denbighshire County
Glyntraian	Ceiriog Valley	Denbighshire	Wrexham County Borough
Gwyddelwern	Hiraethog Hills	Merionethshire	Denbighshire County
Henllan	Vale of Clwyd	Denbighshire	Denbighshire County
Llanarmon-yn-Ial	Ial	Denbighshire	Denbighshire County
Llanbedr Dyffryn Clwyd	Vale of Clwyd	Denbighshire	Denbighshire County
Llandegla	Ial	Denbighshire	Denbighshire County
Llandrillo	Dee Valley	Merionethshire	Denbighshire County
Llandyrnog	Vale of Clwyd	Denbighshire	Denbighshire County
Llanelidan	Vale of Clwyd	Denbighshire	Denbighshire County
Llanfair Dyffryn Clwyd	Vale of Clwyd	Denbighshire	Denbighshire County
Llanferres	Ial	Denbighshire	Denbighshire County
Llangedwyn	Tanat Valley	Denbighshire	Powys County
Llangollen	Dee Valley	Denbighshire	Denbighshire County
Llangollen Rural	Dee Valley	Denbighshire	Wrexham County Borough
Llangynhafal	Vale of Clwyd	Denbighshire	Denbighshire County
Llanrhaeadr-ym-Mochnant	Tanat Valley	Denbighshire	Powys County
Llanrhaeadr-yng-Nghinmeirch	Vale of Clwyd	Denbighshire	Denbighshire County
Llansantffraid Glyn Ceiriog	Ceiriog Valley	Denbighshire	Wrexham County Borough
Llansilin	Tanat Valley	Denbighshire	Powys County
Llantysilio	Dee Valley	Denbighshire	Denbighshire County
Llanynys	Vale of Clwyd	Denbighshire	Denbighshire County
Nantglyn	Hiraethog Hills	Denbighshire	Denbighshire County
Ruthin	Vale of Clwyd	Denbighshire	Denbighshire County

A White Paper, "Local Government in Wales: a Charter for the Future", was published in 1993, reducing the number of unitary authorities to 21. One of the proposed authorities was Denbighshire, including Rhuddlan District, most of Glyndŵr District and a part of Delyn District. The communities of Cynwyd and Llandrillo (of the Glyndŵr District) were proposed to be included in "Caernarfon and Meirionnydd".

However, after May 1993, following the change of the new Welsh Secretary, more time was allowed for consultation, a number of boundary changes were made and the number of unitary authorities increased to 22. The Local Government (Wales) Bill was passed in July 1994.

The Act came into force on April 1, 1996. It established 22 "principal areas" (or unitary authorities) that replaced the eight counties and 37 districts formed in 1974. However, the former counties received the status of "Preserved Counties" for ceremonial purposes such as lieutenancy and shrievality. In 2003, their boundaries slightly changed so that they comprise whole principal areas.

The principal areas are styled either "counties" (11 of them) or "county boroughs" (the other 11), but they are usually referred to as counties. The principal areas of Cardiff, Swansea and (since 2002) Newport are also cities. Whatever the name, they all have the same status.

The communities remain the lowest level of local administration in Wales. Their meaning and territorial role did not change a lot after the reform of local government. They may have elected community councils, while the smaller ones may hold community meetings. In towns, the community council is named "town council", and in cities, "city council".

The principal areas are also divided for electoral reasons into wards or electoral constituencies. Their area is established by the Boundary Commission for Wales.

The former Glyndŵr District was therefore divided since 1996 into three parts. The largest part of it (including the communities of Cynwyd and Llandrillo, initially proposed to be included in Caernarfon and Meirionnydd) became part of the new county of Denbighshire. It should be stressed that, although it has the same name, the post-1996 Denbighshire is not at all similar to the ancient, pre-1974 Denbighshire. The former seat of Glyndŵr District, Ruthin, is the new county seat of Denbighshire.

However, the southern parts of the former Glyndŵr District were included either in Wrexham County Borough or in Powys County. The communities along the Ceiriog Valley (Chirk, Glyntraian, Llansantffraid Glyn Ceiriog and Ceiriog Ucha) belong now to Wrexham County Borough. Many debates were held regarding the communities of the Vale of Llangollen. Although initially included in Denbighshire, the community of Llangollen Rural was transferred to Wrexham County Borough as a result of a referendum in 1998. However, the town of Llangollen and the community of Llantysilio remained in Denbighshire, despite the claims of Wrexham County Borough.

Further South, the communities of Llanrhaeadr-ym-Mochnant, Llangedwyn and Llansilin became part of Powys County. A list of all the communities of the former Glyndŵr District and their location is provided in table 1.

6. CONCLUSIONS

Local government in United Kingdom underwent a number of radical reforms during the last decades. In Wales, the need for reform was felt even more because of the marked differences between the highly industrialized counties of South Wales and the

almost inhabited rural counties of central Wales. The two-tier system implemented in 1974 brought a series of changes, reducing the counties from 13 to 8 and the districts from 116 to 37. However, this system proved to be short-lived and was changed again in 1996. 22 unitary authorities or principal areas (called either counties or county boroughs) replaced the former administrative units. Nevertheless, the community remains the basic administrative unit in Wales, but it only has limited responsibilities.

The former Glyndŵr District represents a good example for the description of changes occurred in the administrative organization of Wales. Initially, in 1974, the district was formed by previous districts of Denbighshire and the Edeirnion District of Merionethshire. In 1996, most of the district was included in the new county of Denbighshire, but the Ceiriog Valley was ascribed to Wrexham County Borough, while the southernmost communities were included in Powys. Further debates regarding the area of the Vale of Llangollen led to the inclusion of Llangollen Rural community into Wrexham County Borough, but the town of Llangollen remained in Denbighshire.

REFERENCES

1. Carter, H. (1966), *The Towns of Wales: A Study in Urban Geography*, University of Wales Press, Cardiff.
2. Carter, H., Griffiths, H.M. (1980), National Atlas of Wales, University of Wales Press, Cardiff.
3. Davies, J. (1994), *A History of Wales*, Penguin Books, London.
4. Davies, Wendy (1982), *Wales in the Early Middle Ages*, Leicester University Press. Leicester.
5. Griffiths, R.A. (ed., 1978), *Boroughs of Mediaeval Wales*, University of Wales Press, Cardiff.
6. Jenkins, G.H. (2007), *A Concise History of Wales*, Cambridge University Press, Cambridge.
7. Jenkins, P. (1992), *A History of Modern Wales 1536-1990*, Longman Group, London.
8. Mahler, Margaret (1912), *A History of Chirk Castle and Chirkland*, G. Bell and Sons, London.
9. May, J. (1994), *Reference Wales,* University of Wales Press, Cardiff.
10. Millward, R., Robinson, A. (1971*), The Welsh Marches*, Macmillan, London.
11. Newcome, R. (1829), *An Account of the Castle and Town of Denbigh*, Clwydian Press, Denbigh.
12. Richards, M. (1969), *Welsh Administrative and Territorial Units*, University of Wales Press, Cardiff.
13. Rusu, R. (2000), *Several Geographical Features of Wales*, Studia Universitatis Babeş-Bolyai, Geographia, 2, Cluj-Napoca.
14. Simpson, W. T. (1853), *History of Llangollen and its Vicinity,* Llangollen.
15. Sylvester, Dorothy (1969), *The Rural Landscape of the Welsh Borderland*, Macmillan, London.
16. Thomas, D. (ed., 1977), *Wales. A New Study*, David & Charles. Cardiff.
17. Welsh Office (1993), *Local Government in Wales. A Charter for the Future*, HMSO, London.
18. Williams, G.A. (1985), *When Was Wales? A History of the Welsh*, Penguin, Cardiff.
19. Williams, J. (1856), *Ancient and Modern Denbigh*, Denbigh.
20. Williams, J. (1860), The *Records of Denbigh and its Lordship, vol. 1*, Wrexham.
21. Wood, B. (1976), *The Process of Local Government Reform 1966-1974*, George Allen & Unwin, London.

STUDIA UBB GEOGRAPHIA, LVI, 2, 2011

SOCIO-ECONOMIC IMPACTS OF SHRIMP AQUACULTURE AT KUALA SELANGOR, MALAYSIA

FIRUZA BEGHAM MUSTAFA[1], I. NATHER KHAN[2]

ABSTRACT. – Socio-Economic Impacts of Shrimp Aquaculture at Kuala Selangor, Malaysia. Shrimp farming has been carried out extensively along the coastal areas of Bagan Tengkorak, Tanjung Karang, Selangor, Malaysia. Large areas of mangroves in the area, almost 90% had been cleared for the development of shrimp farming. The closest human settlement to the shrimp ponds are the people of Bagan Tengkorak. A case study was conducted at Bagan Tengkorak to assess the socio-economic and environmental impacts due to the development of shrimp farms in the area. The study group in this case are the people who make a living from the nearby mangrove forests before the shrimp farm development and until now. Result of the study showed that the tiger prawn farming along the coastal areas, did not bring any positive effects to the people of Bagan Tengkorak. The entrepreneurs with their foreign capital cleared and changed mangrove forest and wetland landscape into rows of ponds along the coast. The residents of Bagan Tengkorak did not benefit from shrimp farm development including any job opportunity or aquaculture products from the ponds for trade or consumption. There is no significant infrastructure development or existing infra-structure maintenance taking place in the area due to the development of shrimp farms. Rather, the shrimp farm development along the coast of Bagan Tengkorak has brought many environmental and socio-economic problems including loss of mangrove forest, coastal wildlife habitats, loss of natural resources, frequent flooding, loss of income, reduced fish catch and pest problems.

Keywords: *Shrimp aquaculture, socio-economic impacts, environmental impact.*

1. INTRODUCTION

Most of the socio - economic activity in the district of Kuala Selangor revolves around agricultural activities including rice paddy plantations, vegetable farming, fishery, forestry, oil palm, cocoa and rubber plantations. According to Department of Statistic Malaysia (1991), 32.5 percent of the total labour force in the district of Kuala Selangor is involved in agriculture, as compared to 7.4 percent for the whole Selangor state. This case study was carried out as part of an intensive and extensive study that was carried out to assess the environmental impact of tiger prawn farming along the coast area of Bagan Tengkorak in the district of Kuala Selangor, Selangor, Malaysia.

[1] *University of Malaya, Faculty of Arts and Social Sciences, Department of Geography, 50603 Kuala Lumpur, Malaysia, e-mail: firuza@um.edu.my.*

[2] *Ecotone Environmental Management Sdn. Bhd., Suite 912, Block A, Kelana Centre Point, Kelana Jaya, 47301 Petaling Jaya, Selangor, Malaysia, e-mail: ecotonemalaysia@yahoo.com.*

2. STUDY AREA

The tiger prawn aquaculture farms in Bagan Tengkorak are located 15 km from Bandar Kuala Selangor, Selangor and from 80 km Kuala Lumpur, at Latitude 101º06'45"E, 3º28'15"N to 101º10'30"E, 3º23'40"N, and between Sungai Tengi up to Sungai Mandur Wahid (fig. 1). The size of the farms in Bagan Tengkorak area ranged from 10 to 155 acres and in operation for the past 20 years and used semi-intensive farming method. The surrounding land use consists mainly of oil palm, paddy, coconut and orchards plantations.

Fig. 1. Location of Bagan Tengkorak Area in the State of Selangor, Malaysia.
Source: Kuala Selangor Disctict Structural Plan (1995-2020).

3. RESEARCH METODOLOGY

The case study on the impact of tiger prawn farming on the local community and the surrounding environment was carried out through primary and secondary data collection and observations in Bagan Tengkorak area. The primary data was obtained through field work and interviews with local communities. This study was carried out to assess and record accurately and vividly the peoples' perception, opinion and experiences on socio-economic and environmental impacts before and after establishment of shrimp farms. Interviews were conducted to gather specific information and views about the background and perception of the surrounding people of the tiger prawn farms including benefits gained, socio-economic and environmental impacts, and local communities reaction towards the shrimp farm activities, etc. An exclusive interview was conducted with four respondents as a case study to obtain specific information on the elderly population that is working or making a living from the nearby mangroves before and after the shrimp farms development. The purpose was to obtain information on the issues and problems facing the local population due to shrimp farms development in the area. The interview was conducted between January to February 2001 with Mr. Suhaimi Bin Sapuan (farmer), Mr. Awang Mat Deris (fisherman), Haji Jamhari Bin Tok Cik (fisherman) and Mrs. Mayah Bt. Nayan (clams and shell collector).

4. RESULTS AND DISCUSSION

The results from the study showed that the respondents were only recently realized and correlated the esxistence of shrimp farm after experiencing the detrimental socio-economic and environmental effects especially after direct loss of their livelihood. The respondents namely Mr. Suhaimi, Mr. Awang, Haji Jamhari and Mrs. Mayah explained that they know about the shrimp farm development but did not know of their soicio-econimic and environmental impacts. They start giving attention to the shrmp farms for the past three years, after realizing some direct impact on their livelihood. They realized that more than 300 acres of mangroves have been cleared for the shrimp farms development. The respondent stated that the tiger prawn farms were run by entrepreuners from far away from the districts, with investment from China and Taiwan, while all the workers consists mainly of foreign labourers from Thailand and Indonesia. Not a single village resident are involved in the farming activity or gained any direct economic benefit. The most prevalent problems faced by the villagers of Bagan Tengorak were frequent flood as a result of shrimp ponds development. In 2000 alone the village was flooded twice.

The mangrove forest which remained as a buffer between the sea and the village has been cleared causing tidal waters intrusion to the drains and waterways in the village which in turn caused frequent floods. The man-made coastal bund which divides the coast and agriculture lands from tidal water and saline intrusion was frequently damaged by unabated tidal waves due to loss of mangrove buffer, which in turn caused frequent flooding especially in low lying areas of banana and coconut plantations. Salt water intrusion to the agriculture areas also destroyed the crops and plantations. The villagers complained about the reduced harvest due to the floods and saline intrusion. The floods do not only destroy crops but also damaged their household belongings. This was mainly due to loss of the mangrove forests, which acted as primary flood prevention and erosion control natural vegetative buffer all along the coastal areas. The coastal mangrove forests which naturally retained excessive

flood waters and tidal water including the surface runoff and river overflow during the mansoon seasons. This estuarine mangrove reduced the volume of flood waters running down from the upstream rivers. The importance of mangrove to prevent coastal flood was proven in other studies as well. (Primavera, 1991; Burbridge, 1994; Paw, Chua, 1988). However, this function of the mangrove forest was lost in Bagan Tengorak area due to its clearance for shrimp farms.

The clearing of mangrove forest along the coast of Bagan Tengkorak caused loss of important wildlife habitats. Mangrove forests play an important role for coastal wildlife including as major breeding grounds for coastal fisheries. (Bailey, 1988; Field, 1981; Rutzler & Feller, 1996). There are many wildlife endemic to mangrove forests and are dependent on these forests for their survival. (Hutchings, 1981). Monkeys are the worst affected wildlife and lost its natural habitats and food sources. Due to the loss of their habitats in mangrove areas, the monkeys have migrated to urban and village areas including the banana and coconut plantations. The monkeys are not only eat their crops but also destroyed the young coconut fruits and buds. The villagers incurred heavy losses due to the consistent damages caused by the migrated monkeys from mangrove forest. According to Mrs. Mayah, before the mangrove forests were cleared, the villagers can harvest up to 1000 coconuts, but now the number has dropped to 600. The monkeys had invaded the villagers' houses and ruinied the household items apart from stealing their food. According to Mr. Awang, he had to use the recycled fishing net around the household items to keep the monkeys out of their household items. The villagers had to wrap the bananas and other natural food items with used fishing nets to avoid monkey being stealing them.

The villagers also complained of lack of seafood and other natural products from the mangrove and mudflat areas which were abundant before the development of shrimp farms. The villagers could make a living from collecting siput sedut, lala, cockles, crabs, mudskippers and fish from the mangrove forest. The villagers harvested mangrove plants as a food source such as *Acrostichum sureum* (piai) where the stem is used vegetable, *Avicennia officinalis* (api-api ludat) where the fruit is boiled and eaten and *Brugueira sexangula* (berus) where the leaves and stem are used vegetables. The clearing of the mangroves has deprived the villagers of the seafood and crops from the mangrove. Mrs. Mayah who has been collecting siput sedut for a long time says that her yield from collecting siput sedut has decreased. According to her, she used to collect an average of 10 kg per day, which reduced to 4 - 5 kg per day after establishment of shrimp farms. The number of siputs is declining due to their habitats loss as a result of shrimp farm cultivation. Bailey (1988) also reported the same results and it his opinion that local communities dependent on coastal natural products are commonly isolated in the economy. Bann (1998) and Munro (1993) explained that the loss of coastal products due to the change in land use from mangrove forests to aquaculture and the natural coastal resources which were common property has become private property, to the point that the locals has lost access to the coast to make a living.

The results of other studies supports this views such as the study by Roggeri (1995) at five villages in Songkhram Valley, Mekong River, Thailand, where the villagers were dependent on the mangrove resources. This socio-economic study showed that the villager got 60of their main source of protein from the mangrove forests around Huai Nam U, Thailand. In Malaysia, the coastal and river community got their food such as fishes, crabs, prawns, cockles, and even herbal medicines from the mangrove forest. Leaves, stems, fruits, and seeds are among the main resources used everyday. For example, the leaves of *Rhizhopora sp.* can be eaten as a vegetable, while; the nuts from the *Avicennia alba* can be broiled and

eaten. Study by Phan & Hoang (1993) in Vietnam, showed that local community is marginalized in Dong Rui, Tien Yen regional, Hoang Tan,Yen Hung and also in Vinh Thuc Island, Vietnam. Local community not only depends to natural resources from the mangrove forest but also used the mangrove forest as their settlement areas.

In the current study, the 70 years old Mr. Awang, who works as a fisherman since he was a child, informed that his catch was declining significantly. According to him, the catch today is not as bountiful as before, and has been declining by about 20 – 30 percent due to the clearing of the mangrove forests. Additionally, the fisherman now a days have to use engine boats to go further out to sea to get more fishes as the coastal areas are no longer abundant with fishes. Several other studies concur to these results. Bann (2002) in Cambodia and Perez-Sanchez and Muir (2003) found that aquaculture activities do not increase the income of fishermen, but actually reduces the catch. There are many species of fishes and aquatic life that inhabit the mangrove forest for at least part of their life cycle (Semesi 1998). A study by Chong et al. (1998) which was carried out in the Straits of Klang and Angsa Island showed a positive correlation between large numbers of fishes with the total areas of mangroves. Research showed that the waters around mangrove trees are important breeding grounds for fishes and other marine aquatic life. Intensive reclamation of mangroves for the development of Kuala Selangor urban areas as well as aquaculture activities reduced the potential of mangroves as breeding grounds for coastal fisheries. Many other researchers including Primavera (1991) in the Phillipines, Aksornkoae (1978) in Thailand and Purwito and Nurzali (1977) in Indonesia showed positive correlation between mangroves and prawn landings.

Before the development of shrimp farms, the local villagers were able to use natural resources from the mangroves to fulfill their daily needs. Mrs. Mayah said that previously, she could use firewood from the nearby mangrove forests. Now, there are no more wood that can be used as fuel. The villagers also used nipah leaves from the mangrove to make their roofs in the 1970's but now the use of nipah leaves was decreasing. The nipah leaves were used to make the roofs of fowl-houses and sheds. Nowadays, nipah leaves are hard to come by and alternatives are explored or purchased to make roofs. The mangroves forests provide resources that are the main source of income for the locals. It provides food (fish, deer, birds, and vegetables), building materials (bamboo, straw, and timber), fuel for cooking and for other economic commodities such as smoking rubber, burning bricks and medicines (Semesi, 1998; Phan and Hoang, 1993; Aksornkoae, 1985; Boonnitee, 1978; Sukristijono 1979; Dixon 1989). In South East Asia such as Thailand, Malaysia and Indonesia, the coastal community has manipulated the mangrove to fulfill their daily needs and additional income (IPT-Asian Wetland Bureau, 1994). The mangrove forests are the main source of food, medicines, fuel, as well as construction materials (Chansang *et al.* 1982; Jara, 1985).

Loss of the mangroves to shrimp farms development has also caused the local population to lose their recreational spot. Before the mangrove was cleared, the villager used to do their recreational activities in the forest, such as attracting birds, bird watching and fishing. The villagers also use the forest products to make souvenirs such as mats and household items. Nowadays, the villagers are no longer able to attract birds. In fact, the villagers have also lost their source of materials for making souvenirs. The villagers have lost the green and serene scenery of a forest that was their recreational area in their free time. The mangroves are an important part of recreation, culture, and tourism as it provides natural aesthetic beauty for activities such as watching fireflies, fishing, bird watching and attracting birds (Soepadmo, 1985; Dingwall, 1984).

Although the villagers bore many problems from the development of the shrimp farm projects in the coastal area of Bagan Tengkorak, the villagers have not made many complaints. Most of the villagers do not know whom to make complain or report. They are disappointed that development that was done in their area is not only giving them any benefit, but it is actually having a detrimental effect on them in terms of losses due to floods, reduced crop production, monkey attacks, loss of income as well as loss of their recreational area. Their reaction is only voiced out to the Head of Village (Tok Sidang) and the Village Committee. However, no follow up action has been taken any time. Only when there was flooding in the area, the local authorities would take some remedial measures.

5. CONCLUSION

Villagers have lost their natural resources due to the clearing of the mangrove forests along the coast of Bagan Tenglorak for shrimp farms. The mangrove clearance has caused the villager to lose their source of income, especially those who dependent on mangrove for livelihood. Some of the villager had to look for other jobs. Monkeys, which lost its mangrove habitats, migrated to village areas and became nuisance and also caused the villagers to lose up to 50% of their crops. The local populace also experienced poor quality of life as result of monkeys invasion and damage caused to their household items. Almost 2 to 3 times a year, the waterways will overflow causing floods in the residential and plantation areas. Loss of income due to loss of mangrove forest to shrimp farm development caused several hardship and loss income to the people of Bagan Tenglorak and fishermen in particular due to smaller yields.

R E F E R E N C E S

1. Aksornkoae, S. (1978), *Structure of mangrove forest at Amphoe Khlung Changwat Chantaburi, Thailand*. Symposium on mangrove and estuarine vegetation in South East Asia. Universiti Pertanian Malaysia, Serdang, Selangor.
2. Aksornkoae, S. (1985), *Traditional uses of the mangrove in Thailand*, in Field, C.D. and Dartnall, A.J. (ed.)., *Mangrove ecosystems of Asia and the pacific status, exploitation and management*. Proceedings of the Research for Development Seminar, p. 104-113.
3. Bailey, C. (1988), *The social consequences of tropical shrimp mariculture development*, Ocean and Shoreline Management, 11, p.31-44.
4. Bann, C. (1998), *The economic valuation of mangroves: a manual for research*, Economy & Environmental Program for Southeast Asia.
5. Boonnitee, W. (1978), *The rhizophoras of Thailand*, Symposium on mangrove and estuarine vegetation in South East Asia, Universiti Pertanian Malaysia, Serdang, Selangor.
6. Burbridge, P.R. (1994), *Integrated planning and management of freshwater habitats, including wetlands*, Hydrobiologia, 285, p.311-322

7. Chansang, H., Poovachiranon, S., Wungboonkong C. (1982), *Human impact on a mangrove forest on Phuket Island, Thailand*, Symposium on mangrove forest ecosystem productivitiy in South-East Asia, Biotrop, Bogor, Indonesia.
8. Chong V.C., Wee, G.H., Sasekumar, A. (1982), *Inshore fish and prawn communities of a mangrove shore in Selangor, Malaysia*, Proceedings of the Regional Symposium on Living Resources in Coastal Areas, p. 503-512.
9. Dingwall, P.R. (1984), *Overcoming problems in the management of New Zealand mangrove forest*, In. Teas, H. J. (ed.), *Physiology and management of mangroves*, Dr W. Junk Publishers, The Hague, p. 97-106.
10. Dixon, J.A. (1989), *Valuation of mangrove*, Tropical Coastal Area Management, 4 (3), p. 1-6.
11. Field, C.D. (1981), *Are mangrove really necessary?*, Wetlands Journal of the Coast and Wetlands Society, 1 (1), p. 1-2.
12. Firuza Begham Mustafa (2005), *Environmental Impact of Shrimp Farming in Mangrove Forest in Bagan Tengkorak, Tanjung Karang, Selangor*, PhD Thesis, Universiti Kebangsaan Malaysia, Bangi.
13. Firuza Begham Mustafa, Nather Khan Ibrahim (2008), *Water Quality in Tiger Prawn Aquacultures Ponds at Bagan Tengkorak, Selangor, Malaysia*, Sixth International Symposium on Southeast Asian Water Environment, Bandung, Indonesia.
14. Firuza, B.M. (2008), *An Introduction of Malaysian Mangroves*, Sarjana, 23.
15. Hutchings, P. (1981), *The fauna of mangroves*, Wetlands Journal of the Coast and Wetlands Society, 1 (1), p. 4-5.
16. Ipt-Asian Wetland Bureau (1994), *Seimbas pandang hutan bakau di Malaysia*, Asian Wetland Bureau, Kuala Lumpur.
17. Jara, R. S. (1985), *Traditional uses of the mangrove in Philippines*, in Field, C.D., Dartnall, A.J. (ed.), *Mangrove ecosystems of Asia and the Pacific. Status, Exploitation and Management*, Australia, p. 114-130.
18. Kuala Selangor District Structure Plan (1998), *Kuala Selangor District Structure Plan (1995-2020)*.
19. Munro, J.L. (1993), *Aquaculture development and environmental issues in the tropical Pacific*, in Pullin, R.S.V., Rosenthal, H., Maclean, J.L. (ed.), *Environment and aquaculture in developing countries*, International Center for Living Aquatic Recources Management, Manila, p. 125-138.
20. Paw, J.N., Chua, T.E. (1988), *An assessment of the ecological and economic impact of mangrove conversion in Southeast Asia*, Proceedings of the Asian/US technical workshop on integrated tropical coastal zone management, p. 201-212.
21. Perez-Sanchez, E., Muir, J.M. (2003), *Fishermen perception on resources management and aquaculture development in the Mecoacan estuary*, *Tabasco, Mexico*, Ocean & Coastal Management, 46, p. 681-700.
22. Phan Nguyen Hong, Hoang Thi San (1993), *Mangroves of Vietnam*, The International Union for Conservation for Nature and Natural Resources, Bangkok.
23. Primavera, J.H. (1991), *Intensive prawn farming in the Philippines: ecological, social and economic implications*, Ambio, 20 (1), p.28-33.
24. Purwito Martosubroto, Nurzali Naamin (1977), *Relationship between tidal forests (mangroves) and commercial shrimp production in Indonesia*, Marine Research in Indonesia, 18, p. 81-86.
25. Roggeri, H. (1995), *Tropical freshwater wetlands. A guide to current knowledge and sustainable management*, Development in Hydrobiology, 112, Kluwer Academic Publishers, Netherlands.

26. Rutzler, K., Feller, I. C. (1996), *Caribbean mangrove swamps*, Scientific American, 274 (3), p. 94-100.
27. Semesi, A.K. (1998), *Mangrove management and utilization in Eastern Africa*, Ambio, 27 (8), p. 620-626.
28. Soepadmo, E. (1980), *Mangroves*, Nature Malaysiana, 1 (5), p. 15-23.
29. Sukristijono Sukardjo (1979), *The mangrove ecosystem of the northern coast of West Java*, Proceedings of the Jakarta Workshop on Coastal Resources Management, p. 54-64.

STUDIA UBB GEOGRAPHIA, LVI, 2, 2011

TRAFFIC SAFETY ISSUES IN ROMANIA

CS. MÁTHÉ[1]

ABSTRACT. – Traffic Safety Issues in Romania. The present study, based on statistical data processing, is an attempt to highlight the actual situation of Romanian road traffic safety. The results show both a territorial disparity among the eight NUTS 2 regions and a relative fluctuation over the last 10 years. The extent of traffic growth basically depends on the economical stability of a country, the average household incomes, cultural habits, and political freedom. Romania is about to witness an increase in the number of vehicles registered to traffic in the near future. On the other hand, the Romanian road transport system finds itself in an alarming situation, clearly underdeveloped as compared to the national economy and status. Statistical data demonstrate that 2004 marked the beginning of a downfall concerning traffic safety (i.e.: increase in the number of road accident victims), which is an opposing process compared to the situation of other EU countries. The most critical periods in the year, based on multiannual statistical analyses and distributed by months, are August and October; what concerns diurnal distribution, Friday and Sunday are marked as the most disastrous days, while the hourly distribution brings out the 6-8 PM interval as such. Empirical data show that, besides the human factor, physical factors play the most important role in inducing road accidents. From the point o view of road traffic safety, the optimal solution would be to create a possibility to cross distances on motorways, in most cases possible. It is little hope, without improving the quality of road transport network, for any kind of amelioration of the present unfavorable conditions of road traffic safety.

Keywords: *road traffic, safety, transport infrastructure, road accidents, victims and injuries.*

1. INTRODUCTION

Studying transportation processes and their effects upon socio-economic development represents a distinct section of modern geography. Transport geography is specialized in investigating the transportation phenomenon from the perspective of material, passenger and information transport.

What concerns the functioning of the economic system, transports are to be considered as basic factors. Taking into consideration the possibility of transporting raw material, other sources of energy and labour force, on the one hand, and end-products and services, on the other, we can say that transports are daily activities of great importance. The spatial development level of the transport network pertaining to a certain transport method, the transport capacity and the quantity of freight and passenger transport reflect the importance and the role played by the issue under question in the socio-economic processes.

[1] *Babeş-Bolyai University, Faculty of Geography, 400006 Cluj-Napoca, Romania, e-mail: csongor.mathe@geografie.ubbcluj.ro*

The transport system can be perceived as the totality of the transportation methods utilized to cross and comprise spaces in order to transport goods and people. According to Wackermann (quoted by Vlăsceanu Gh., 2004), the transport system may be defined as the totality of transport routes, infrastructure, means of transport and traffic flow related to a specific area. The road transport system - with the vehicle and the road as its main components, respectively on the basis of the volume of freight and passenger transport - can be considered the cardinal method of transport.

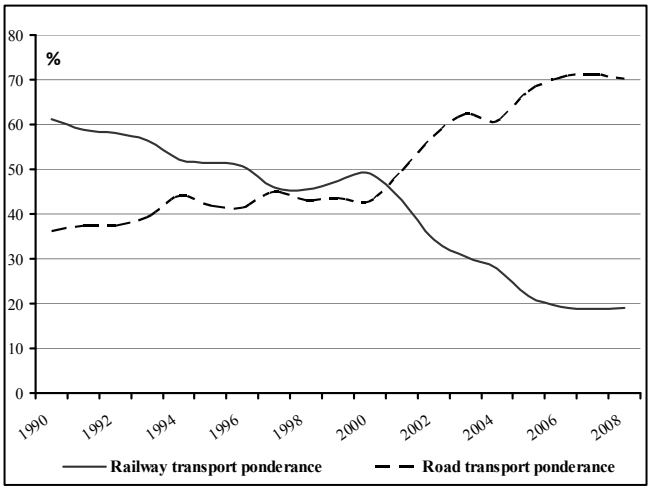


Fig. 1. Ponderance of rail and road transport in the total volume of merchandise transport. (Source: Eurostat, edited).

Auto transport represents a rapid method of transporting goods and people within short and medium distances due to the simplicity of the technological operations at the loading and unloading, respectively shipping and unshipping points, on the one hand, and no parking obligations (except for accidents, technical problems and adverse weather conditions), on the other. Auto transport offers the highest efficiency in short distances compared to other means of transport (Sbora T., et al, 1984). The most important particularity of auto transport is undoubtedly the high level of mobility, which confers vast utility possibilities. Flexibility - in meeting the requirements of transport in varied surfaces (steep hills, very sharp bends) - represents the most relevant advantage of auto transport (White H. P., 1983). Roads are highly advantageous by virtue of free choice of routes in conformity with transport necessities. Thus, road transport carries out "door-to-door" deliveries (Sbora T., et al, 1984).

2. THE IMPORTANCE OF ROAD TRANSPORT IN ROMANIA

The 20th century – in conformity with the occidental trends - brought Romania a continuous increase of freight and passenger transport. Besides this process, another change has taken place in connection with the division of freight and passenger transport into different transport methods (Pop P. Gr., 1984).

Ponderance of road transport in the national freight and passenger transport (%)

Table 1

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008
Passengers * (passengers-km)	81,9	83,2	87	87,8	88	89,5	89,6	90,6	92,4
Freight (tone-km)	42.9	49.6	57.3	62.4	60.8	67.3	70.5	71,3	70,2

*Total passenger transport by cars and buses (coaches). Source: Eurostat, edited.

Thus, while rail transport has lost a great deal of its importance, road and air transport have gained a lot more ground. So, transport carried out on railroads suffered a gradual decrease, but, in the meantime, road transport became the leading solution. Regarding freight transport (Fig. 1), the inflexion period was in 2000/2001. Owing to the increased tendency to get separated in the favour of road transport, rail transport has lost 30 percent (its 49.1% of the total freight transport decreased to 19%), meanwhile road transport obtained 70.2% in the same year. What concerns intercity and international public transport, the period of transition lasted longer, coming to an end in 2004 (source: Office for National Statistics); afterwards, the importance of road transport has become overwhelming. The ponderance of road passenger transport in the total passenger transport (Table 1) reveals its top position among all types of transport. Presently, the ponderance of road transport is getting closer to the mean values registered in the EU-15 (Fig. 2).

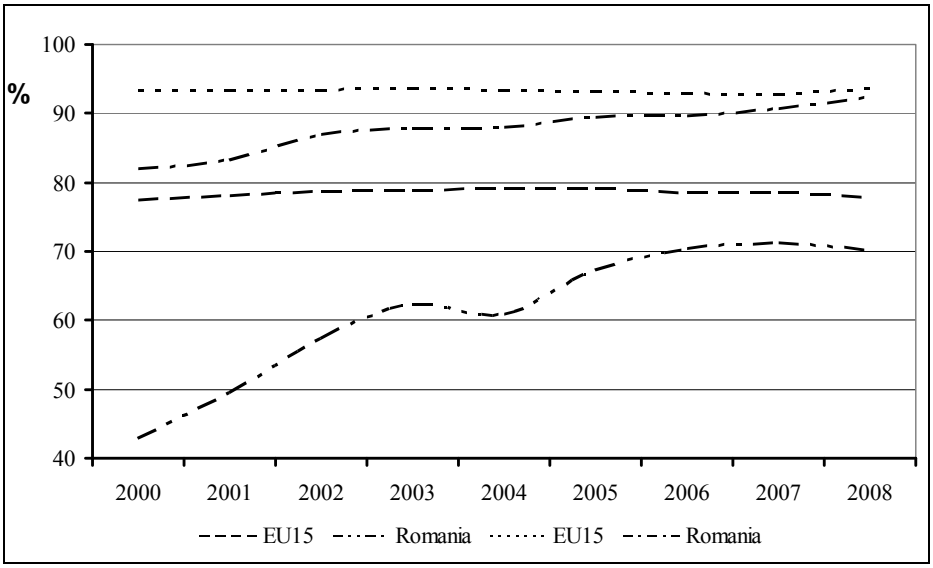


Fig. 2. Ponderance of road passenger transport in the total of terrestrial transport (••• and -•-) and ponderance of road freight transport in the total of terrestrial transport (--- and -••-) in Romania and EU 15 country. (Source: Eurostat, edited).

3. THE EVOLUTION OF ROAD TRANSPORT INFRASTRUCTURE

The basic components of road transport are the road and the vehicle. Road construction and maintenance requires capital investment, therefore it goes hand in hand with economic development. The development level of the road system of any country it is tightly connected to its socio-economic development (White H. P., 1983). Road configuration in Romania has several characteristics. We have to remark that there is a parallelism between public roads and railroads. Other characteristics are centrality, the connection between the interior and exterior ring roads and radiality (Pop P. Gr., 1984).

The highest level of development – today – regarding the road system is the segregation of the traffic on motor roads, characterized by the lack of intersections and level passages, separation into distinct lanes on a single course and lack of access and exit points. From the perspective of invested capital and the vast area required, motor roads are extremely expensive (White H. P., 1983).

Road transport infrastructure generally comprises the totality of public roads, the networks of filling stations, the means of transport through which freight and passenger transport is carried out and all the related equipment (indicators, signalling and controlling devices). In the followings I will discuss the unforeseen changes in the public road system, as well as, the multi-annual increase of the registered vehicles.

Classification of public roads (km) and their density between 1990-2009

Table 2

Category	1990	1995	2000	2005	2006	2007	2008	2009
Public roads - total	72816	72859	78479	79904	79952	80893	81693	81713
Modernized	16592	17608	19418	21148	21549	22042	22865	23847
With thin road surface	20544	20397	19999	20915	20964	21397	22561	22515
National roads (incl. European roads)	14570	14570	14715	15706	15755	16118	16599	16503
County and village roads	58133	58176	63651	63970	63969	64775	65094	65210
Motorways	113	113	113	228	228	281	281	321
Density of public roads (within 100 km^2)	30,5	30,6	32,9	33,5	33,5	33,9	34,3	34,3

Source: Eurostat, National Institute of Statistics, 2010.

According to statistical data with reference to the period 1990-2010, the national public road system slightly extended and it also showed a qualitative development owing to the increase of the ponderance of modernized national roads and motorway sections (Table 2). Traffic infrastructure developed by trying to stand up to the ever increasing volume of freight and passenger transport. However, there are huge differ-rences concerning the quality of road infra-structure on national level. An alarming as-pect is that four out of the eight development regions do not have a motorway even in 2010!

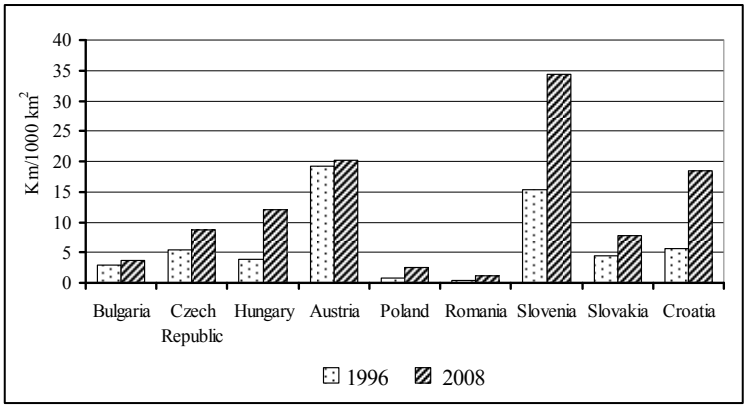


Fig. 3. Evolution of motorway density in Eastern and Central European countries in the period 1996-2008 (Source: Eurostat, edited).

Regarding this topic, there are other enor-mous differences a-mong the four regi-ons: South-Muntenia Development Region

takes the leading position with 228 km, followed by the Bucharest-Ilfov region with 51 km, the North-Vest region with 41 km and finally the South-East region with 1 km (Source: INSSE, 2010). The processes of road system modernization and constructing new motorway sections advance at a very slow pace as compared to the level of road traffic expansion. The fact that only 93 km of motorway was handed over in the period 2004-2009, which still meant around 29% increase comparing to year 2004, gives us a clear view of the highly inconvenient situation. We are currently in the last position in the European Union regarding motorway density in comparison with the territory of the country. Figure 3 stresses upon the deficiency in Romania in connection with motorway disposal as compared to a few neighbouring countries. We may point out that Romania has given the least priority to motorway construction from among the old socialist block of countries.

In the meantime, the number of registered vehicles per a thousand inhabitants substantially increased; growth tendency was linear in the period 1995-2009 (Fig. 4). In the case of vehicle categories (Table 3) we can identify different processes.

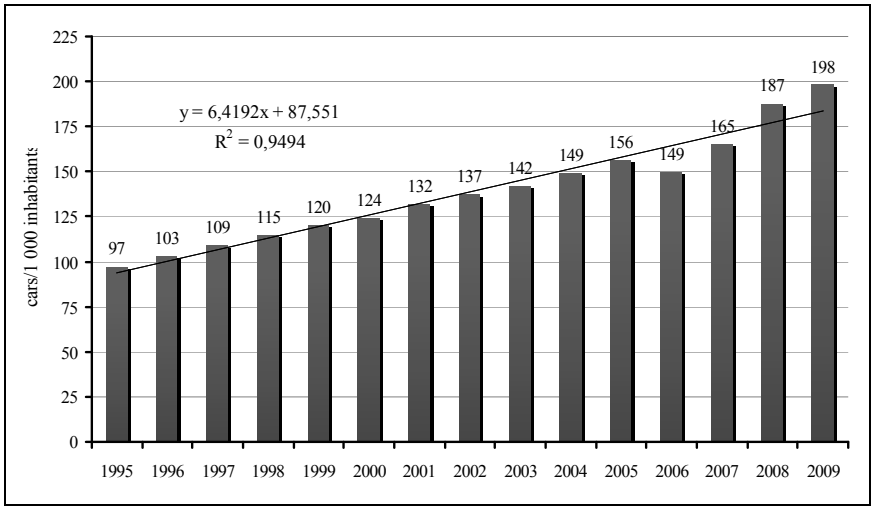


Fig. 4. Changes in the number of vehicles registered to traffic in Romania (Source: Eurostat, edited).

The increase in the number of vehicles in the period 1996-2005 was registered in the following instances: cars, buses, minibuses and utility vehicles; in turn, there was a decrease in the number of motorcycles and scooters.

According to statistical data, minibuses formed the most dynamic vehicle category with a 440% increase compared to the first year (1990), followed by the cars (279%) and lorries and vans (211%). The increase tendency in the number of vehicles is an overall phenomenon in every EU member country after 1990. The 2006 reference values in Romania (167 vehicle/1000 inhabitants[2]) lag way behind the average registered in EU, as follows: 27 EU countries have 466, 25 EU countries have 482 and 15 EU countries have 508 vehicles /1000 inhabitants (source: Eurostat).

[2] Vehicles here mean only passenger cars, minibuses and multi-cabs with maximum nine seats (including the driver).

Vehicle evolution by categories in the period 1996-2006

Table 3

Type of vehicle	1990	2000		2006	
	Total	Total	1990 (%)	Total	1990 (%)
Cars (including cabs)	1292283	2777594	215	3603437	279
Minibuses	3975	13535	341	17755	447
Buses	24297	27181	112	22636	93
Lorries	258701	427152	165	545300	211
Mopeds	206202	137103	66	101474	49
Motorcycles	105444	102105	97	92507	88

Source: Statistics Annual, 2007.

As we are heading toward a more prosperous economy in concordance with living standards (GDP/inhabitant), Romania might hold out the promises of a greater increase in the number of vehicles due to the motorization process of the population and its joining the EU trends, which are still out of reach.

4. SAFETY ISSUES IN ROAD TRAFFIC

User requirements towards the vehicles, concerning their equipment and technical performances, can be summarized as follows: capability to travel under safety conditions (regarding functionality), to offer an enhanced level of comfort, to be economical (maintenance costs, charges for use), to have enough engine power to be on the road in conformity with the legal prescriptions and dispose of efficient security systems (active and passive).

Road accidents can be defined as spontaneous defects of the road-vehicle-driver-circumstances system, which implies carrying out one or several necessary manoeuvres toward restoring a state of safety, but without a successful outcome (Crişan V., 2000). Road accidents may entail damage, injuries or, in the worst cases, even the decease of one or several passengers. Traffic safety is a very timely issue because the number of vehicles registered to traffic has shown an enormous increase, a tendency still growing and leading to increasingly crowded road traffic.

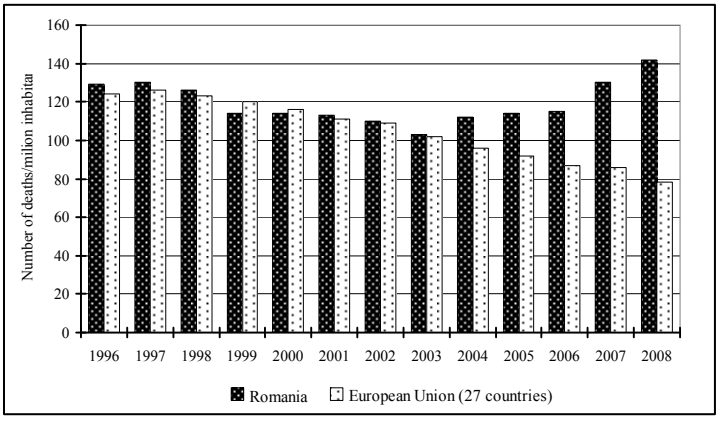


Fig. 5. Number of road accident victims in Romania and EU in the period 1996-2008 (source: Eurostat).

Consequently, traffic planning has to take into consideration the safety issues of those on the road. The basic question could be formulated as follows: is there any possibility to reduce the number of road accidents, victims and injuries in a state of an ever

increasing congestion in road traffic? Without taking measures to prevent road accidents, their contingency to multiply is extremely high in proportion to the growing number of vehicles involved in traffic. Fortunately, we have a very pleasing example at hand: the evolution of road accident statistics in the EU. The number of vehicles per 1000 inhabitants in EU (25 countries) showed more than 20% increase in 2006 as compared to 1996, but the number of victims as a consequence of road accidents between 1996-2007 decreased with almost 25% (Eurostat).

Nevertheless, when it comes right down to Romania, the situation is much more complicated. The period 1990-1996 was characterized by fluctuations of potential aggravation and improvement tendencies followed by a term of a year by year drop regarding the number of victims: year 2003 brought along an 18% decrease in the number of victims as compared to 1998 (victims/one million inhabitants). Starting with year 2004 and throughout year 2008, there was an alarming aggravation concerning the changes in the number of road accident victims (Fig. 6). If we get to analyze the nation-wide tendencies in comparison with those present in the EU, we will come across exasperating results. Romania had integrated into the international tendencies by 2003 (103 deaths/million inhabitants), but it took a totally new direction afterwards (Fig. 5). Romania registered a 38% increase in the number of road accident victims per one million inhabitants in 2008 (reaching up to 142 deaths/million inhabitants) as compared to year 2003. During the same period, EU (27 countries) registered a 23,5% fall-off (to 86 deaths/million inhabitants), leading to substantial statistical differences. Consequently, it is no surprise that the number of bad accidents and serious injuries (Fig. 6) shows similar tendencies to the number of road accident victims.

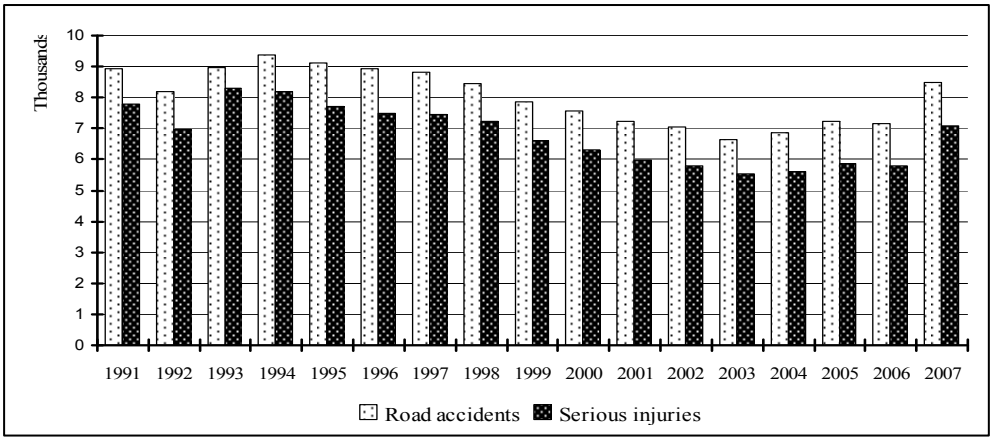


Fig. 6. Changes in the number of serious injuries and bad road accidents in Romania in the period 1991-2007 (source: Statistics Annual, 2007).

After ten years of progress in traffic safety, reference data for 2008 were similar to those of 1998-1999. As for bad accidents, the lowest values (6654 cases) belong to year 2003, while the maximum values (9381 cases) pertain to year 1994. Values referring to 2007 represent a 28% increase compared to the minimum values of the period 1991-2007. Changes in the number of serious injuries purport the same distribution: minimum values originate from year 2003 (5538 cases) and maximum values are linked with year 1993 (7031 cases). 2007 registers values approx. 28% higher than 2003.

Based on the existent statistical data, we may carry out even more sophisticated analyses that lead us to a deeper understanding of the processes regarding road traffic and the circumstances that create the very conditions for road accidents.

Traffic accidents by periods of their occurrence within a calendar year (Fig. 7) reveal a heterogeneous distribution, as the registered maximums are from the period August-October (approx. 10% per month) and the minimums are reported during winter, as well as, at the beginning of spring-time (= January-March with values of 5-6%). The percentage regarding the intermediary months generally fits into the linear tendency between the two extremes. The highest values of casualties were registered in October. It is no coincidence that the values correspond to the disposability of the citizens' vehicle use throughout the year. Changes in the number of injuries and victims do not reveal relevant deviations from the fluctuation trends of road accidents.

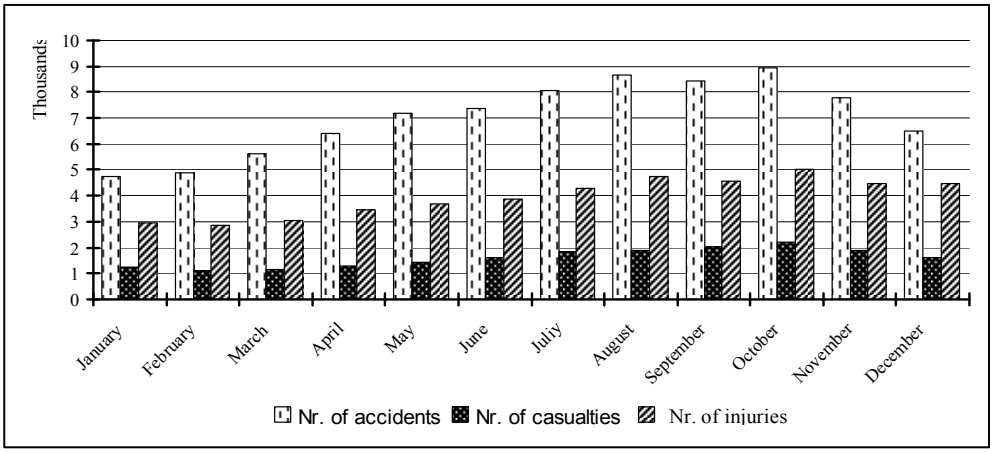


Fig. 7. Monthly variation in traffic accidents, number of injuries and casualties in Romania in the reporting period 1999-2006 (source: The Traffic Police Directorate within the General Inspectorate of Romanian Police).

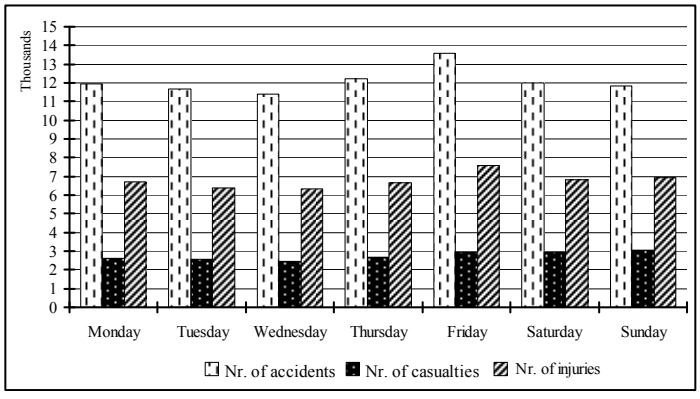


Fig. 8. Diurnal variations in the number of road accidents, injuries and casualties in the period 1999-2006 (source: The Traffic Police Directorate within the General Inspectorate of Romanian Police).

Changes in the number of road accidents, injuries and casualties linked up with the days of the week (Fig. 8) show a much more homogeneous distribution. In the case of road accidents and the number of injuries the maximum values (16%) are registered on Fridays, while the rest of the days have values between 13-14%.

According to statistical data, the highest number of victims was claimed by accidents occurred on Sundays (cc. 16%), while the lowest numbers are registered on Wednesdays (13%). The hourly distribution of traffic events indicates a more emphasized heterogeneity since daytime values are much higher. The majority of bad accidents – also responsible for the most badly injuries - take place between 6-7 PM. This interval equals the rush hours at the end of the workday. The highest values of casualties were registered between 6-10 PM with a 6-7% ponderance. Maximum values (7.3%) were registered between 7-8 PM.

When carrying out a multi-annual analysis of traffic events and their consequences, it is extremely important that one is fully aware of the circumstances and the way events unravellEdit. Contingency measures to reduce the number of road accidents should be based on clarifying the determinative factors that contribute to the unfolding of traffic events. Some of the primary influencing circumstances that directly affect the number of accidents are: road traffic congestion levels, adverse weather and driving conditions.

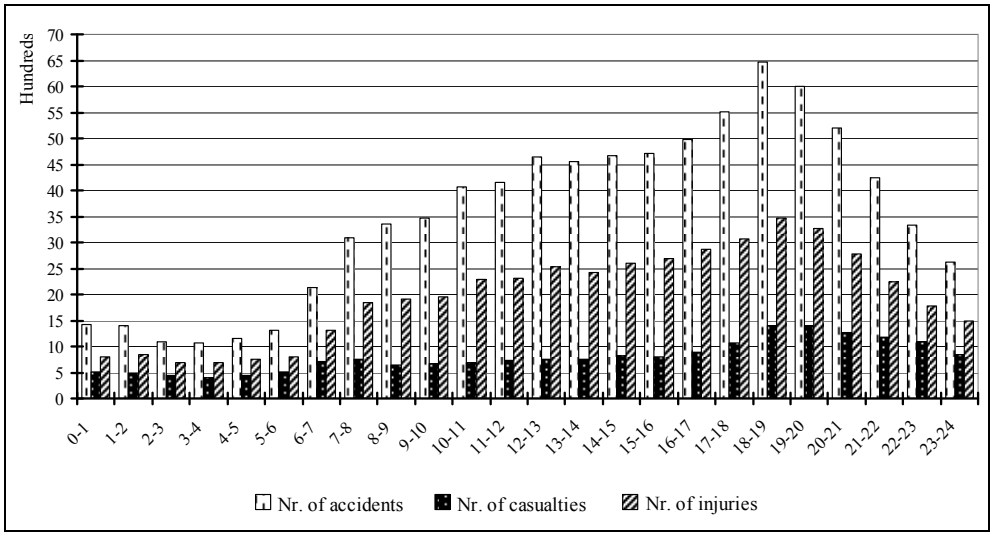


Fig. 9. Hourly distribution of the number of traffic accidents, injuries and casualties in Romania in the period 1999-2006 (source: The Traffic Police Directorate within the General Inspectorate of Romanian Police).

Changes in the proportion of road accidents under conditions of reduced luminosity in the period 1997-2003 and in 2005 fall between 5-7%, followed by an escalating tendency to a value slightly above 23% registered in 2009 (maximum 24% was in 2004). In the meantime, the number of accidents occurring under conditions of darkness indicated a totally different situation: minimum values (14%) are registered in 2009 and the maximums (37%) date back to 1997. The ponderance of these two categories shows a slight decrease reaching 37% in year 2009.

Data concerning the conditions of the roadway in the moment of the accident indicates preponderance in cases when the roadway is dry, which is in line with the August-

October period, when most accidents take place. Tendency towards value distribution shows some kind of approach: in the period 2000-2009 the ponderance of accidents occurred on humid or icy surfaces increased with roughly 20%.

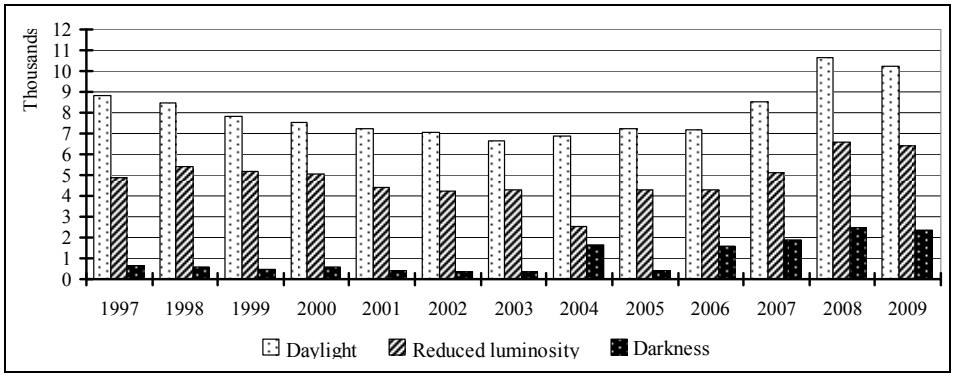


Fig. 10. Changes in the number of road accidents, injuries and casualties on national level by visibility conditions during the reporting period 1996-2007 (source: The Traffic Police Directorate).

The division of accidents by their locations demonstrates that the majority of events take place in localities with a ponderance ranging between 75% (2006) and 92% (1997). The evolution of the number of accidents on motorways over the past ten years has remained below 1 percent, mostly due to relatively small ponderance of motorways within the public road network. So the positive effect of motorways on the traffic safety remains still theoretically in the case of Romania. After the finalization of the planed motorway sections in the near future there are pretty good chances that traffic safety will improve.

Traffic accidents by roadway conditions (%)

Table 4

Road conditions	2000	2005	2006	2007	2008	2009
On dry surface	97,4	94,0	78,7	77,0	77,9	76,9
On wet, icy etc. surface.	2,6	6,0	21,3	23,0	22,1	23,1

Source: National Statistics Institute.

Traffic accidents by locations (%)

Table 5

Place	1997	2000	2004	2005	2006	2007	2008	2009
In localities	92,1	88,2	80,3	82,0	75,3	76,0	77,1	76,9
Outside localities	7,3	11,3	19,1	17,1	24,0	23,3	22,4	22,6
On motorways	0,6	0,5	0,5	0,9	0,8	0,7	0,6	0,6

Source: National Statistics Institute.

If we make an analysis of the accidents considering their components involved, we must stress upon the excessively large number of cases involving pedestrians, too. The ponderance of this sort of collisions has diminished with 14,5% in the period 2000-2009, but they still keep up a high ratio of 39,6%. In turn, the evolution of collisions involving a single vehicle has shown a powerful increasing tendency (21,8%).

Traffic accidents by involved components (%)

Table 6

Type of accident	2000	2002	2004	2005	2006	2007	2008	2009
Collisions involving a single vehicle	15,2	16,8	17,8	18,2	17,0	19,2	22,2	37,0
Collisions between vehicles	30,7	30,4	31,0	35,1	41,7	41,0	40,7	23,4
Collisions involving a vehicle and a pedestrian	54,1	52,9	51,2	46,7	41,3	39,8	37,1	39,6

Source: National Statistics Institute.

These results are in hand by hand with the results from Table 5, witch reflect that there is a serious problem white the accidents inside of localities witch caused the huge numbers of pedestrian involved accidents. Possible solutions to diminish this type of traffic accident could be the construction of bay-pas roads around settlements to reduce the transit flows, the optimization of the city's traffic flows and to initiate educational-informational programs for the pedestrians.

5. CONCLUSIONS

Based on the presented data, we can form an opinion about the rather discouraging situation and the actual processes going on in the world of road traffic in Romania. Transport infrastructure – with main stress on public road density and quality – is far more underdeveloped with respect to the virtual traffic that makes use of it and the average of the European countries. The motorization level of the population is very low as compared to the European average, which will probably entail the continuation of a linear or even a more intensive tendency (in strong correlation with the performance of the national economy) in the near future, towards an increase in the number of vehicles registered to traffic.

Every clue points at an even higher level of congestion of the national road system in the near future, which gives room for uneasiness at the contingency of a further growing number of road accidents along with their negative consequences.

The modernization and development processes of road infrastructure and carpools are not synchronized; the development of the public road system takes place at a pace way below the optimal level (Katona P., 2008). Certain components of road transport system stand clearly on a critical level, which also needs mentioning the density of motorways and their unequal distribution, with the capital city at the epicentre. From the point of view of road traffic safety the optimal solution would be to create a possibility to cross distances on motorways, in most cases possible. Motorways are advantageous in many ways: besides ensuring the possibility of a high speed travel - that means it reduces travel time, which changes the concepts of "far" and "near" -, they also offer the possibility to transport the highest quantity of freight/passengers in a time unit, and the ponderance of road accidents towards the actual traffic would be very low as well.

Motorway sections planned for future construction (the South Transylvanian motorway extended over the pan European corridor with number IV. and the North Transylvanian motorway, respectively) will bring along a considerably positive contribution, though not even these changes can be a holistic solution for the ever worsening road traffic issue. On the whole, the Romanian road transport system finds itself in an alarming situation, clearly underdeveloped as compared to the national economy and status. The prospects for the present situation to head toward a state of equilibrium – acceptable for future society – are quite hopeless owing to the high expenses necessary to carry through maintenance and modernization operations on road infrastructure (Katona P., 2008).

Presently, the safety level of road traffic in Romania is disquietingly low; one can not even take delight in hypothetical predictions. Besides the human factor - proper behaviour in traffic, obeying traffic rules, correct evaluation and management of dangerous situations in traffic, travelling at a speed that is considered to be safe under given road conditions and traffic circumstances etc. -, there is no doubt, physical factors play the most important role in inducing road accidents.

REFERENCES

1. Burcea, P. (2000), *Considerarea factorilor rutieri în creşterea siguranţei circulaţiei pe drumurile publice*, Teză de doctorat (rezumat), Universitatea Tehnică de Construcţii, Bucureşti.
2. Caraiani, Gh. (1999), *Culoarele paneuropene de transport şi implicaţiile asupra infrastructurii României*, Edit. Lumina Lex, Bucureşti.
3. Crişan V. (1983), *Trafic rutier fluenţă şi siguranţă maximă, poluare minimă şi normele circulaţiei rutiere cu modificările recente*, Edit. Facla, Timişoara.
4. Katona, P. (2008), *Development of transport infrastructure In Romania in the 21st century*. In Neighbours and Partners: on the two sides of the border, Edit. Kosuth Egyetemi Kiadó, Debrecen.
5. Pop, P. Gr. (1984), *România. Geografia circulaţiei*, Edit. Ştiinţifică şi Enciclopedică, Bucureşti.
6. Sbora, T., Şerban, D., Nistorescu, T. (1984), *Sistemul unitar al transporturilor*, Edit. Scrisul Românesc, Craiova.
7. Turbuţi, Gh. (1978), *Sistemele de transport*, Edit. tehnică, Bucureşti.
8. Vlăsceanu, Gh., Negoescu, B. (2004), *Geografia Transporturilor*, Meteor Press, Bucureşti.
9. White, H.P., Senior, M.L. (1983), *Transport geography*, Edit. Longman Scientific & Technical, Essex.

Data sources

10. Anuarul Statistic 1993, 1996, 2000, 2006, 2007.
11. European Commission (2006), *Keep Europe moving— Sustainable mobility for our continent*, Office for Official Publications of the European Communities, Luxembourg.
12. *http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home/*
13. *http://www.igpr.ro/DPR/index.htm*
14. Institutul Naţional de Statistică *http://www.insse.ro/*
15. Ministerul Transporturilor şi Infrastructurii, *http://www.mt.ro/*
16. *Planul Naţional de Dezvoltare*, 2007-2013.

STUDIA UBB GEOGRAPHIA, LVI, 2, 2011

WTO PREDICTIONS REGARDING THE TENDENCIES OF EVOLUTION OF THE FORMS OF TOURISM (II)

AL. PĂCURAR[1]

ABSTRACT. – WTO Predictions Regarding the Tendencies of Evolution of the Forms of Tourism. As a consequence of the fulminating development of international tourism, with a major impact upon the national and worldwide economies and with its most visible social valences, the specialized department of ONU for tourism – WTO, with its headquarters in Madrid, did an analysis of this touristic phenomenon, followed by previsions on a short, medium and long term, regarding the most dynamic forms/types of tourism, in its acception until the horizon of the years of 2020 (*xxx, 2002, Tourisme: horizon 2020, OMT, Madrid, pp. 73-127*). In this study we will look at tourism linked to natural coastline and/or mountainous factors, sports tourism and adventure tourism. For each one of these forms of tourism we have in view the presentation of a clear definition, approved by OMT, the estimation of its importance as part of the general touristic phenomenon, the characteristics of the demand and of the supply, the perspectives of development and the commercialization of the services for each type in the vision of OMT.

Keywords: *tourism linked to natural coastline and/or mountainous factors, sports tourism, adventure tourism, touristic centers (resorts), touristic circuits, "combined" vacations, sea diving, types of adventure.*

1. INTRODUCTION

The explosive development of tourism in general and especially of international tourism, as a result of the accumulation of a tremendous "requirement for amusement", has determined the departments and the regional, national, superstate and worldwide institutions of tourism to elaborate a series of previsions of development of several forms/types of tourism until the horizon of the years of 2020. As a result of the economic development, of the more pronounced urbanization, a phenomenon which expanded into a series of countries with an emergent economy such as the one found in India, China, Brazil, Russia and so on, the international touristic displacements have increased and new forms of tourism have emerged, which have found some increasingly larger market niches. In meeting the touristic request found in expansion as far as the volume and the structure are concerned, the states of the world come with attractive offers, with a high degree of personalization and with destinations to more remote locations. The OMT office of prognosis declares that, among the most dynamic forms of tourism until the horizon of the years of 2020 (*xxx, 2002, Tourisme: horizon 2020, OMT, Madrid, pp. 73-127*) are registered: the tourism linked to natural coastline and/or mountainous factors, sports tourism and adventure tourism.

[1] *"Babeş-Bolyai" University, Faculty of Geography, 400006 Cluj-Napoca, Romania, e-mail: sandu@geografie.ubbcluj.ro*

2. TOURISM LINKED TO NATURAL FACTORS

For this type of tourism, OMT indicates that there are two great distinct markets: on one side *tourism within centers (resorts) of villegiatura*, either these are coastline or mountainous, and on the other side *touristic circuits*. Out of these, balneal tourism occupies the most important place, therefore, only Mediterranean coastline tourism registers over 100 million STI (ITA= international touristic arrivals), Spain, Italy, Greece, France and Turkey, holding 85% out of the total.

From the point of view of the cycle of life of the product that is offered, the destinations such as the Caribbean and Hawaii for North-American tourists, the Mediterranean for European tourists and Guam and Hawaii for the Japanese tourists, have reached the phase of maturity or even the stage of saturation, with products that are already "classical and hyper-exploited". As a response to this reaction, the tourists search for new destinations that are more remote and more exotic. However, for example, not the entire basin of the Mediterranean Sea is behaving the same way; if the European Mediterranean countries represent destinations that are in a phase of maturity, the destinations from Northern Africa, or from Eastern Mediterranean or from the Middle East, still have some unexplored touristic deposits.

Depending on the European touristic demand, the perspectives of increase of several touristic destinations, in the view of OMT, for the horizon of the years of 2020, are presented the following way:

OMT: previsions regarding the increasing importance of several touristic destinations

Table 1

Touristic Destination	The Type of Dimensions of the Touristic Region	The Type of Touristic Location	The Market Segment that is Addressed	The Perspectives of Increase
Mediterranean Europe	Large	Agglomeration of touristic resorts	Diverse, but young people and families with a medium budget predominate	Moderate
USA – Florida	Large	Agglomeration of touristic resorts	Diverse, but young people and families with a medium budget predominate	Good
North Africa and Eastern Mediterranean	Large	Mixture of touristic stations and small touristic establishments	Diverse, but young people and families with a medium budget are not preponderant	Good
Remote destination from Europe: Caribbean, The Indian Ocean, Asia	Large	Mixture of touristic stations and small touristic establishments	Couples without children, of various ages with medium and raised budget	Very good

Source: xxx, 2002, Tourisme: horizon 2020, OMT, Madrid, page 74.

If for the year of 2002, in Europe were registered 10-12 million demands for vacations spent at great distances and in exotic resorts, OMT estimates the demand at 25-30 million for the year of 2010.

Likewise, OMT estimates that, within European coastline and / or mountainous tourism, a tourism developed on niches will emerge, respectively tourism intended to shopping, being known that several prestigious resorts such as – Cannes, Antibes, Biarritz, San Remo, Bad Ischl, Bad Gastein, Avoriaz, St. Moritz and so on, offer the possibility of shopping for expensive merchandise as well. For Europe, this segment of market is evaluated at approximately 5 million tourists.

Coastline tourism presents tree defining characteristics: a superior growth above the average level, destinations that are as remote as possible, the increase of the market niches – such as tourism destined to shopping, therefore some market niches which will develop in the favor of the experienced tourists who are having personalized preferences.

Within this context, *"all inclusive" vacations* are going to develop and combined vacations, where two or more elements will be added next to the "beach" factor, such as the one of shopping, the cultural one, or the one of congresses; this is the way in which the *"combined" vacations* will develop. Another type of tourism that will take greater proportions is the *honeymoon trip*.

"All inclusive" vacations are the ones in which all the labor conscriptions, or the larger part of them are paid for, paid in advance: transportation, accommodation, transfers, the transportation of the luggage, taxes, food, drinks, equipments, certified instructors; other locations go even further, by offering sunglasses, bathing suits, beach equipments, and so on.

This type of vacation is much demanded, and it is in development. The most important chains which promote it are Mediterranean Club or Club Med, Allegro Resorts, Robinson Club, SuperClubs, Clubs International, Sandals and Aldiana Club, which own and exploit 169 centers or villages destined for vacations with over 45000 beds (table 2).

Main bidders of "all inclusive" touristic packages in the ear of 1998

Table 2

Group	Number ofadministrated holyday villages	Number of rooms
Club Med	77	25 315
Allegro Resorts	24	6 455
Club Robinson	24	5 397
Super Clubs	12	3 238
Clubs International	12	2 547
Sandals	10	2 032
Club Aldiana	10	840

Source: *xxx, 2002, Tourisme: horizon 2020, OMT, Madrid,, p. 76.*

This type of vacation experienced a rapid expansion in the region of the Caribbean, where the increasing demand led to the establishing of new holyday villages; the most spectacular results were recorded in Mexico, Gambia, Malaysia, Bulgaria and Turkey.

The hotels with such kind of services obtain a superior efficiency per room, however when starting from capacities of over 150 rooms.

Holyday villages became specialized, according to the profile of the customers, *into holyday villages for unmarried, for couples and for families* and then in accordance with the touristic profile – *recovery, safari, skiing, cruises, other specialized activities*.

With regard to the profile of the customers, it is difficult to create a standard profile, but this type of tourism addresses particularly young people, belonging to the **"dinks" category (namely Double Income no Kids**, that is to say the couples with two incomes, without children) and to families.

Being very attentive to the psychological profile of the tourists, mainly at the level of mentalities, taste and behaviors, the great operators of this field have somehow specialized, some for families (Boscobel, Beacher, Club Med, Robinson Clubs), others for couples (Sandals and Couples), others for hedonists (Hedonism II), others for health care and maintaining physical shape (Le sport), and so on.

Honeymoon trips are done by people who travel to foreign countries in order to get married and / or to spend their honeymoon. These people can be accompanied by other persons as well. This veritable "fashion" found a great success with the touristic consumer. In the view of the majority of the tour-operators, the success of this form of tourism is due to the budget issues, for a wedding held in a foreign country is cheaper for most of the couples.

The Europeans, the North-Americans, the Australians and the Japanese frequently Turn and opt for to this type of tourism; merely in Great Britain, approximately 10% out of the total of marriages (300 000 / year) are performed in foreign countries, TO Britannic Thompson registering increases of the sales of over 80%, regarding this segment, during a period of four years (1995-1999).

If the travels done to foreign countries with the purpose of marriage are a more recent topic, the wedding travels and the "honeymoon" travels are much older. Only for USA, these travels come up to approximately 32 billion USD, according to OMT estimations. This entire specialized organism (OMT) estimate that 68% of the newlywed Americans offer themselves vacations to foreign countries, but the percentage raises up to 85% with the Europeans and to 98% with the Japanese.

This type of tourism is less subjected to the conjuncture of the economy, and the tourists "spend on an average, three times more, the average period of the stay being of 8-9 days".

The most favorite destinations are Bahamas, The Dominican Republic, Barbados, Antigua, Kenya, Florida and Mexico.

The profile of these tourists is easier to outline, their ages are included between 20-55 years and are part of the "drinks" category.

From the point of view of the tendencies, the preference for the region of the Caribbean will increase, Australia has entered among the first ten main destinations and it will consolidate its position, and the emergence of some alternatives regarding the thematic is expected – the exploitation of the surrounding environment, excursions.

3. SPORTS TOURISM

A more obvious connection is manifested between the sports movement and tourism. In the OMT vision, five reasons arise to support this affirmation:

- local, national, regional and international sports events have enormously gain in popularity, being events pursued by hundred of millions of fans;
- dynamic sports activity, is appreciated for the positive effects it has upon the organism, concerning health in general;
- the institutions of public power became convinced of the value of sports as a binding agent of the international relationships, and of its economic capacities as well;
- there is a veritable "contest" within the organization of some wide- spreading sports competition, and the calendar of these events is very meticulously established;
- individuals that were passionate about sports actively communicate among them, due to the progress of fast and instantaneous communications and a real mass media "industry" specialized in this type of activity.

Sports tourism is practiced by individuals that actively or passively participate at sporting activities, who travel and stay outside their residences. Sport is the reason why the individual travels, who, complementary, practices tourism. Therefore, sports tourism is active and entertaining. The greatest number of touristic displacements is generated by winter sports, mainly skiing and sea diving.

Tourism generated by winter sports can be defined, according to OMT as "the ensemble of the activities the tourists do within the resorts for practicing winter sports, that are very diverse: alpine skiing or fond skiing, ice skiing, skating, sleigh-riding, races with sleigh-rides pulled by horses, dogs or reindeers, snowboarding" and so on. The greatest number of tourists belongs, by far, to the category of the skiers. Their number is evaluated to 11 million in the USA, 4 million in Canada, 8 million in Europe. OMT exemplifies with the 830000 British citizens who, in the year of 1998 travelled to foreign countries in order to practice skiing, or with the 54,1 million total days of vacation spent by the American skiers, during the same year.

The offer is various, but it is concentrated in several regions. Therefore, the main skiing resorts are situated in Europe, especially in the Alps, the Pyrenees, the Carpathians, then in the USA and Canada. France, Italy, Austria, Switzerland, but Slovakia, Romania, Poland and Bulgaria as well, are countries that promote with assiduity this type of offer.

The American and Canadian mountainous resorts witness a remarkable development, being attractive because of the low prices and because of the air connections which recently operates with a raised frequency in the area.

The profile of the customers is of youth "dinks" type and of families; the preponderant group of age is the one between 25-34 years old, differentiated on snowboard, where it decreases to the ages between 12-17 years old and on skis mainly, where it increases to the ages between 35-44 years old. The individuals of male gender predominate, respectively single young men, who generally, are tourists with medium and over medium incomes, and regarding the degree of training and education, 30% have higher education, and 30% are without studies.

This type of tourism has other particularities as well, among which:

- it is in a great part tributary to the climatic factors;
- it is a form of expensive tourism, if we only think about the price reagarding the equipment; the introduction of the Euro currency in most European countries, had a beneficial effect in this department;
- new ways of skiing and winter sports gain in popularity, and the concept of "skiing weekend" develops within resorts such as Chamonix, Chambery (France), Alagna (Italy) or Lech from Austria, locations that are found in the proximity of some international airports. In addition to this, travel by car or by train develops, especially because of the fast trains;
- a tendency of travelling to new destinations develops, locations that are open for skiing for the entire length of the year – Alaska, Riksgrawsen in Switzerland, beyond the Arctic Circle, but also in the Southern hemisphere – Las Lenas (Argentine), La Parva (Chile) or in Australia.

The marketing of tourism products takes into consideration, to a great extent, the quality of the natural environment, respectively of the track, of the snow and of the ice, imposing more and more the necessity of training of the traveling agents for its selling.

Sea diving for the individuals who are passionate about this hobby, generate tourism for travels toward destinations that offer this possibility. It is being estimated to 6 million people; amongst these 2/3 are Europeans, being followed by the Americans and by the Australians.

This type of tourism has a high developing rhythm; Asia with its emergent economies represents an important source of growth, the total turnover is estimated, by OMT, in between 4-6 billion USD.

The warm seas, with coral reefs, are the main areas of practicing sea diving. In order to be attractive, the touristic locations must fulfill several conditions, among which: the clearness of the marine water, high visibility, the variety of marine flora and fauna, the proximity of the touristic infrastructure and the quality of the facilities for diving, proper training of the staff.

The main destinations recognized by OMT that offer these conditions are: at the Red Sea: Sharm el Sheik, Ras Muhammad, Sha'ab Abu Nuhas, Tiran Gorge; at the Caribbean Sea: Caiman Island, Cuba; at the Indian Ocean: Seychelles Island and Maldives Island; in Austral Africa: South Africa, Mozambique; in South-Eastern Africa: Thailand, Malaysia, Indonesia, Philippine; in Australia: Great Barrier Reef; in Melanesia: Fiji, Vanuatu, Solomon Island, Papua New-Guinea; in Micronesia: Yap Island, Palau and Truck; in Eastern Pacific: Cocos Island, Malpelo and Galapagos.

The profile of the tourists, of the customer that practices this form of tourism is the following: celibate and "drinks"; this is different from the standard profile of the international tourist. Generally these are leading staffs, or they have liberal professions, with annual incomes of over 80000 USD.

Generally, one out of three passionate divers travels to foreign countries in order to practice diving. They can be classified among the *dilettantes*, who are mostly young people, *fanatics*, to whom the only purpose of the travel is diving, they travel in groups, either to near destinations, or to more distant ones (the category of the rich people) and the *casual divers*, who take advantage of the rich fauna and flora, in order to do some diving.

In Europe, most divers are found in Italy (700 000), Germany (550 000), France (500 000) and Great Britain (110 000). The majority of them prefer the Red Sea and the Maldives as destinations.

In perspective, in Europe, there are several countries who seek to launch themselves on this market: Malta, Turkey, Cyprus, Corfu Island from Greece and the Canary Islands.

For the year of 2020 the number of certified divers is estimated to 10 million.

This form of tourism does not limit itself to diving only; the surfers are included in this category as well, reaching approximately 5 million, or tourists who prefer underwater travel, whose number is estimated to 3 million, by OMT.

4. ADVENTURE TOURISM

This active form of tourism designates travels performed by individuals who lay emphasis on physical condition, on physical exercise and sports that are practiced in lesser visited places. This type of tourism can be subdivided into *forms of easy adventure* – cycling, balloon trips, hiking, the observation of the fauna and into *forms of rough adventure*, that requires aptitudes from the part of the probationers and involves certain risks – gliding, mountain climbing, as well as particular forms – navigation on fast rivers (rafting), plunging with the flexible chord and so on.

OMT estimates that this form of tourism generates 0, 55 million international travels, with a fast increase until 3 million, in the year of 2020. For Europe, the turnover of this form of tourism rises up to approximately 1 billion USD in the year of 1998, which means an average of 1500 USD for a travel of adventure. In the year of 1998, most tourists who practiced this form of tourism came from Germany – 130 000, from Great Britain – 100 000 and from France – 80 000.

In North America, this form of tourism is much more developed, for the year of 1998 OMT estimated a number of 85 million individuals who have done such types of travels, and have spent 45 billion USD.

The operators who work in this veritable market niche are specialized. In Europe, the most important are Explore Worldwide, Jumbo and Wikinger Reisen, with a few of tens of thousands of holydays sold in 1998. The most frequent destinations are Nepal, Peru and Ecuador.

In North America, where this form of tourism is very developed, there are over 8700 companies who are active within this department. There, only 10% of the tourists prefer other areas, respectively Central and South America, Austral Africa and Nepal.

The standard profile of adventure tourism is the one of young and the one of "dinks" and/ or couples whose children left their residence. As a rule, they are trained, they travel a lot, and their average age is of 40 years old, they have a successful career and high incomes. Generally, the vacation is reduced, respectively to 6, 9 nights for an active holyday and to 5, 4 nights for an expanded holyday.

As an alternative or as a possibility for development, that for the moment is just in a phase of exploring, is *space tourism*. For the year of 2020, OMT estimates that the number of space tourists will reach to 1 million, a figure which we consider to be overrated.

5. CONCLUSIONS

International tourism represents a factor of economical-social development through its influence upon the production, over consumption and over employment. Once the option regarding the development of tourism was adopted, this does not only mean the increase of the number of the international touristic arrivals, of the touristic services and products that are offered, the development of the touristic infrastructure and of transportation. The qualitative aspects are also taken into consideration, such as the social impact, the human impact, the cultural impact, aspects regarding the protection and preservation of the surrounding environment and the cultural-artistic aspect as well.

The International Tourism Organization, having at hand a series of macro- and micro-economical and social indicators and having the required expertise, elaborates previsions regarding tendencies of development of some forms and types of tourism at different taxonomic scales (local, regional, global), the standard profile of the customers, just as the evolution of the destinations, respectively the increased demand for several touristic destinations, the maintaining of certain categories or the diminishing of the demand in others, with their corollary of consequences regarding the local economy.

Finally, OMT is able to apprehend any opportunity regarding new forms of tourism addressed to some market segments, to what they call - niche tourism, just as they appear in the cases that were presented, the one of sea diving, the one of the gradual forms of adventure, of the wedding voyages, etc.

R E F E R E N C E S

1. Archambault, M., coord., (2002), *Le tourisme à l'heure des alliances, des fusions et des acquisitions,* OMT, Madrid.
2. Benavides, D.D., (2001), *The sustainability of International Tourism in Developing Countries,* WTO-UNCTAD, New York.

3. Cristureanu, Cristiana, (1992), *Economia şi politica turismului internaţional*, Editura Abeona, Bucureşti.
4. Cristureanu, Cristiana, Neacşu, N., (1999), *Turism internaţional*, Editura Oscar Print, Bucureşti.
5. Duhamel, P., Sacareau I., (1998), *Le tourisme dans monde*, Ed. Armand Collin, Paris.
6. Kindersley, D., (1988), *Atlas encyclopedique mondial*, Ed. Libre Expression, Montréal.
7. Mesplier, A., Duraffour, P.B., (2007), *Le tourisme dans le monde,* Editura Bréal, Paris.
8. Păcurar, Al. (2009), *Turism internaţional*, Editura Presa Universitară Clujeană, Cluj-Napoca.
9. x x x, (1982), *Dicţionar poliglot de comerţ exterior şi turism*, Ed. Sport–Turism.
10. x x x, (1984, 1988, 1992), *Diercke Weltatlas,* Georg Westermann*,* Braunschweig.
11. Organisation Mondiale du Tourisme, (1984), *Étude économique du tourisme mondial.*
12. x x x, OMT, Organisation Mondiale du Tourisme, (1987), *Etude économique du tourisme mondial*, Madrid.
13. x x x, (1989), *Tourism policy and International Tourism în OECD,* Paris.
14. x x x, (1990–1997), *Atlasseco,* Atlas economique mondial, Paris.
15. x x x, (2002), *Le tourisme à l'heure des alliances, des fusions et des acquisitions,* OMT, Madrid.
16. x x x, (2002), *Tourisme-horizon 2020,* OMT, Madrid.
17. x x x, (2003), *Aperçu sur le tourisme mondial et divers sujets d'actualité*, OMT, Madrid.
18. x x x, (2003), *L'activité des croisières dand le monde,* OMT, Madrid.
19. x x x, (2003), *Le secteur des croisières*, în *Aperçu sur le tourisme mondial*, OMT, Madrid.
20. x x x, (2003), *The International Meeting Market 1994-2003,* Rapport ICCA, Amsterdam.
21. x x x, (2003), *MICE Outbound Tourism 2000,* OMT, Madrid.
22. x x x, (2005), *Tourism Market Trends. Europe,* OMT, Madrid.
23. x x x, (2006), *Compendium of Tourism Statistics. Data 2000-2004*, OMT, Madrid.
24. x x x, (2006), *Tourism Market Trends: Europe,* OMT, Madrid.

STUDIA UBB GEOGRAPHIA, LVI, 2, 2011

THE ROMANIAN RURAL ARCHITECTURAL HERITAGE FROM MARAMUREŞ LAND – PERSONALITY, DISTINCTIVENESS AND PROTECTION

AL. ILIEŞ [1], J. WENDT [2], DORINA ILIEŞ [3], IOANA JOSAN [4], GR. HERMAN [5]

ABSTRACT. – The Romanian Rural Architectural Heritage from Maramureş Land – Personality, Distinctiveness and Protection. The ethnographic area, perceived as belonging to the region of Maramureş is being identified with the depression that is recognized in the specialized literature as the Country of Maramureş, drained by the Tisa River and its tributaries Iza, Mara and Vişeu. From ethnographic point of view it may be considered as being representative for the Romanian area, having well preserved in situ genuine elements. This study points out the most representative elements specific only for the Maramureş area and which, due to some legislation lacks on the background of a wide process of globalization through cultural levelling, gradually lose the place specificity. The first place in this category belongs to the wooden churches and gates. These two elements began to be "exported" in the past years outside the limits of the Maramureş regional area, both in Romania and abroad. By identifying, assessing, quantifying, mapping and protecting these *in situ* and *out situ* goods, through the critical filter of some specialists outside the Romanian area we plan on marking some solutions for preserving the genuine elements and separate them from those distorting the concept of *'Maramureş wooden church'* and *'Maramureş wooden gate'* from structural, stylistic and architectural point of view.

Keywords: *Maramureş wooden church, Maramureş wooden gate, "Maramureş Land", genuine, traditional.*

1. INTRODUCTION

The Romanian ethnographic area is one of the most diversified in point of composition and heterogeneous from ethno-cultural point of view. EU's slogan *"unity in diversity"* identifies perfectly with our approach of reassessing the cultural heritage of the Romanian area and clearly determining the genuine, specific and traditional elements. Due to the national and international specialized literature that highly promoted the image of Maramureş, both before and after

[1] *University of Oradea, Department of Geography, Tourism and Territorial Planning, 1 University str., 410087 Oradea, Romania / University of Gdansk, Department of Geography and Regional Development, e-mail: ilies@uoradea.ro*

[2] *University of Gdansk, Department of Geography and Regional Development, e-mail: geojw@univ.gda.pl*

[3] *University of Oradea, Department of Geography, Tourism and Territorial Planning, 1 University str., 410087 Oradea, Romania, e-mail: iliesdorina@yahoo.com*

[4] *University of Oradea, Department of Geography, Tourism and Territorial Planning, 1 University str., 410087 Oradea, Romania, e-mail: ioanajosanr@yahoo.co.uk*

[5] *University of Oradea, Department of Geography, Tourism and Territorial Planning, 1 University str., 410087 Oradea, Romania, e-mail: grigoreherman@yahoo.com*

1990, a major interest for this area was noticed and was practically transposed on two directions. On a first direction, having a smaller number of supporters of the idea of *in situ* preservation of the genuine elements and that are the specialists of the field, at the same time with a newer direction that includes a category of "*contemporary admirers of traditional art"* who make considerable efforts of 'importing' and 'preserving' 'out situ' this kind of elements. Within this context, identifying, assessing, quantifying, mapping, integrating and promoting the genuine and traditional, natural and anthropic heritage within a solid development strategy is an absolutely necessary approach in this new context favourable for the "*cultural levelling"* and highly under the influence of the beneficences of globalization.

The region of Maramureş, like other ones showing such peculiarities of the Romanian cultural area is still one full of authenticity and tradition and the peasant (the owner), on the background of a suitable natural framework has to be made responsible for and motivated for preserving the customs and the specific features characterizing it. A scientific approach centred on such a direction may be carried out through quantitative, qualitative and cartographic knowledge of what is genuine, traditional and representative for the Maramureş rural area and especially for those elements considered genuine values as the church, the house and the gate. Thus, *'The link between church, gate, house and the mentality of the Maramureş people result out of the symbolic meanings of the sculpture, therefore the appellation of 'wood civilization' for the Maramureş country* (Gabriel Ilieş, 2007, 152).

2. ANALYTICAL FRAMEWORK

Maramureş has been mentioned in papers since 1199, although it is a lot older. In the old Latin papers it appears under the name: Maramoros, Maramorisius, Maramurus. The historical Maramureş Region had the great heights of the Ukrainian Carpathian, the Rodna Mountains, the Ţibleş Mountains, the Gutâi-Igniş Mountains, the Oaş Mountains, and the Bârjava Valley and westwards the Tisa Plain it laid up to Teceu, as boundaries until 1920, with a total surface of over 9,000 sqkm. After the Second World War the part southward Tisa remained between the borders of Romania (approximately 3,311 sqkm) while the region of Maramureş on the right side of Tisa was integrated to the former ex-Soviet area, the nowadays Ukraine, respectively. "The Maramureş Land" is currently 52% of the surface of the Maramureş County. The purpose of the suggested study is the area of the "Maramureş Land" (the part southward Tisa) under two aspects: *as in situ keeper of genuine elements* on one hand and area of *"kitsch contemporary creation and inspiration"* on another hand. Having depressions, a network of valleys (Iza, Mara, Cosău, Vişeu, Vaser etc) which is the ground of *"individualizing the lower units"* (Ilieş, 2007, 41), with 214 m heights in Tisa's waterside and 2,303 in Rodna Mountains, the natural fortress of Maramureş that is widely extended northward Tisa, comprises 57 localities out of which 5 towns and 52 villages with a population of approximately 250,000 inhabitants (fig. 1). The Maramureş area is therefore included in the "*great diversity of countries from ethnographic and cultural point of view, counting on the fact that they are enclaves of preserving the archaisms but also Christian inhabited places*" (P. Cocean, 1997; Gabriela Ilieş, 2007, 21).

3. METHODS

This study uses methods and tools certified in the specialized literature, among which are those determining the functionality of a territorial system (I. Ianoş, 2000), referring to the methods of region division (M. Dăncuş, 1986; P. Cocean, 2005), land management based on the

heritage resources (P. Cocean and Şt. Deszi, 2001; V. Surd and al., 2005; G. Erdeli and a. V. Gheorghilaş, 2006; M. Ilieş 2007; N. Ciangă and Şt. Deszi, 2007), tourism development and "*turistification*" (N. Cazelais and al., 2000), preservation and protection of genuine heritage (G. Wall, 1993; D. J. Timothy and S. W. Boyd, 2003; A. J. Veal, 2006; Al. Ilieş and al., 2008, 2009; Dorina Ilieş and Ioana Josan, 2009), etc. Beside these, information gathered through the office work and compared with the actual facts is added. Creating the data base and managing it through geographical informational systems is an extremely used current method offering satisfactory results. The statistical method is also extremely useful in the process of systematizing, ordering and interpreting the data gathered from the specialized literature and the practical activities. Using some principles as: spatiality, causality and integration for identifying answers to the *where? why?* and *how?* triad is the key for such an approach be necessary and useful for the specialty research on the one hand and for the practical field of applications on the other hand.

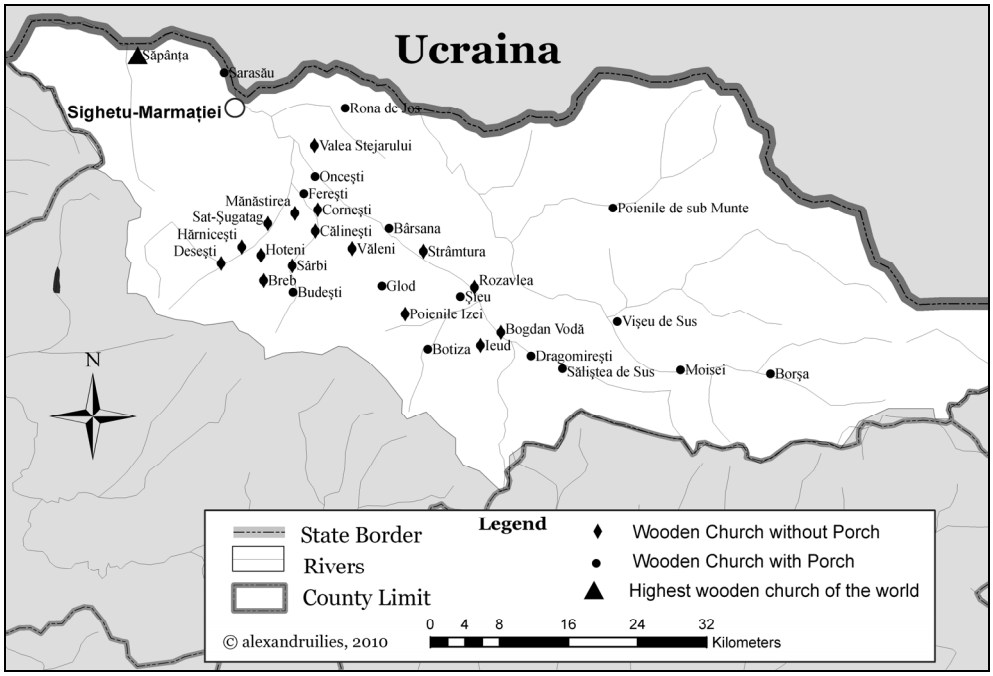


Fig. 1. Maramureş Land. Villages with Oldest Wooden Churches (Architectural Monuments); (data sources: own authors; B. Toth, 1969; Gabriela Ilieş, 2007, 150).

4. ANALYSIS OF THE CURRENT SITUATION

From scientific point of view, excepting the museums, unfortunately the suggested theme is not included in the priorities of the local authorities (town halls, town councils, natural and legal persons etc). The fast rhythm of degradation and destruction of this heritage category, especially after 1990, requires such an approach implying reassessing, identifying, quantifying, mapping and integrating those genuine resources that still exist in the area of Maramureş,

through measures that, along with the study projects aims also at concrete measures of preserving and promoting such things as: allotting financial resources, precise laws for protecting, awareness-raising through promotion and motivation at the level of the host local communities of the risk of losing them as well as the advantages that may arise from keeping and consolidating them from the level of personal goods up to regional and world level.

4. 1. What type of existing element enters the category of genuine and traditional?

An answer to such a question results from an extensive documentation from historical, architectural (I. Godea, 2007), ethnographic and geographical (P. Cocean, 1997, M. Ilieş, 1999) point of view. The museums, especially the ethnographic ones may support such an approach. The presence of such elements in preservation stage in the open-air museums may be models for identifying and maybe restoration (according to the case) of those existing in situ. It is a scientifically certified method that a painting showing *"The Image of the Maramureş Land is represented by the form of the wooden church outlined through the wooden gate carved with traditional motifs"* (Gabriela Ilieş, 2007, 148) remain a continuous and untouched by the influences of modernity reality.

The wooden churches are contemporary symbols of the Maramureş area (fig. 1) and although characterized by a wide typology, they have easily identifiable common elements such as: the high arrow-like tower, multistaged and shingle covered four sided roof. Most of the wooden churches of Maramureş date back to the XVIIth – XVIIIth Centuries, many of them rebuilt after the destructions caused by fires. The oldest one is *The Church on the Hill* of Ieud village that dates back to 1364.

The architectural types identified according to the shape of roof and tower, determine many construction variants. Most of them have multistaged roof and tower supported by stepped beams. The regional typology is dictated by the distribution of the craftsmen and their area of influence, characteristic that is reflected in the regional typology of the wooden gates also, with the same nuclei of spreading the models (Gabriela Ilieş, 2007, 148).

The Maramureş Gates stand out by the building material (oak), the shingle roof and the symbolic motifs. Regarding the structure they have 3 pillars (fig. 14) or 5 by doubling the lateral ones (fig. 15), this one being a newer variant. Lately, the modern influences emphasize solid pillar gates rich in decorations (with a lot of new elements; fig 16). Concerning the geographical distribution, one notices a uniform allotment with the traditional type prevailing, and the oldest models are in Cosău Valley (Al. Ilieş and al., 2009).

Both the churches and the gates are characterized by *"a decor produced by pre-Christian symbols imprinted through the resourcefulness of the craftsmen, being a proof of conservatism and basis of the cultural identity"* (Gabriela Ilieş, 2007, 152). The symbolic meanings of the sculptural motifs of the Maramureş gates are marks of authenticity and keeping the specific model in case of the newly built ones. Among the reference elements we mention (M. Dăncuş and G. Cristea, 2000): the twisted rope, the Sun, the Moon and the Sun, the tree of life, the crown, the flowers, the wheel, the Greek cross with equal bars, the Roman cross, the snake and the horns. Depending on these symbol elements we may identify whether the new constructions keep the traditional architectural style or not. Such models should also be found in the projects portfolio of the town planning departments of the Maramureş area, and the new constructions be approved depending on them.

4. 2. Quantitative and qualitative aspects

In 2007, in 32 villages there were 35 functional wooden churches (fig. 1), whose dominant architectural line was given (B. Toth, 1969; Gabriela Ilieş, 2007) by the multistaged roof without turret (22 churches) and the tower supported by stepped beams (22 churches). Maramureş wooden churches may be grouped into two major categories, depending on the period they were built, respectively in **A** and **B**.

A. Those specific for the XVIIth - XVIIIth Centuries and older, that may be considered models for the new projects. Regarding the preservation place, they fall into two categories:

-those preserved *in situ*, 35 wooden churches still functional in 32 villages (fig. 1, 2);

-those preserved *out situ*, not functional anymore, yet rebuilt in the Maramureş area: the case of the Museum of Maramureş in Sighetu Marmaţiei (fig. 3);

-those preserved *out situ* (outside the *Maramureş Land*) in open-air museums in Romania and whose displacement was carried out before 1990. A significant number of such churches (but also traditional gates, houses and installations) is met in the open-air museums in Bucharest (The Village Museum; fig. 4), Dumbrava Sibiului (The Museum of Folk Art Technique), Baia Mare (The Village Museum), Cluj Napoca (The Ethnographic Museum of Transylvania) etc. The role of this type of museum is suggestively illustrated by Dăncuş Mihai (the Manager of the Museum of Maramureş) in 2009: *"Now, when the globalization 'roller', …, having serious and unpredictable consequences, the museums are opening the chance of rediscovering of what has been and is being lost in a fast rhythm, 'the cultural identity' and even the national one of some ethic groups and even nations. Tens and hundreds of thousand people come in our museums and surprisedly found within themselves: who they are; where they come from; what their relationships with 'other people' are; what they have given and what they have received"* etc.

Fig. 2. Wooden Church from Sârbi Village (Maramureş; Sârbi Josani- XVIII Century).

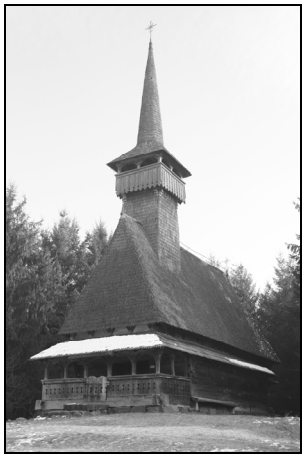


Fig. 3. Wooden Church (XVI Century) from Onceşti Village moved in Museum of Maramures in Sighetu Marmaţiei.

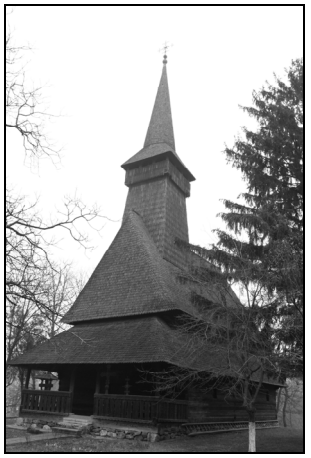


Fig. 4. Wooden Church (XVI Century) from Maramureş moved in Village Museum of Bucharest.

Fig. 5. Wooden Church from Bârsana Monastery (Bârsana Village; Maramureş).

Fig. 6. Wooden Church from Săpânţa-Peri Monastery (Săpânţa Village; Maramureş).

Fig. 7. New Wooden Church from Vişeu de Sus (Maramureş).

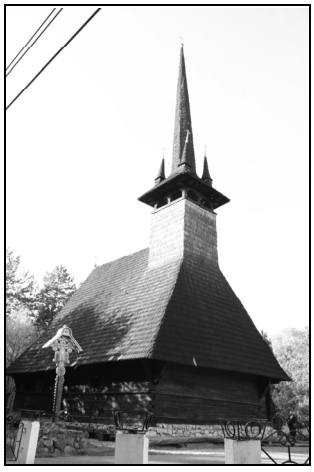


Fig. 8. Wooden Church from Brusturi Village rebuilt in "*Maramureş style-partially*" in Băile Felix (Bihor County).

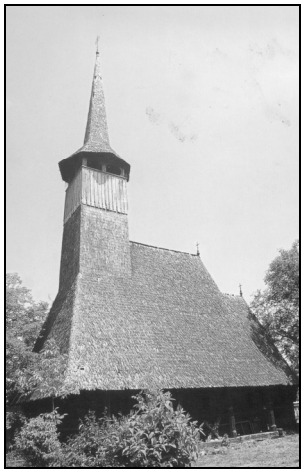


Fig. 9. Wooden Church in "*Bihor style*" *in situ* in Borşa Village (Bihor County).

Fig. 10. Wooden Church in "*Maramureş style*" built in Cluj-Napca (Cluj County; Haşdeu University Campus).

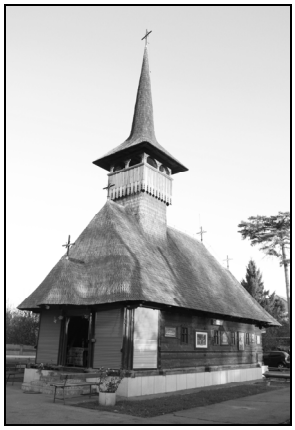


Fig. 11. Wooden Churh in "*Mixed (Maramureş-Bihor) style*" built Oradea in 2008 (Armatei Române str).

Fig. 12. Wooden Churh in "*Maramureş style transformed*" built Covasna Resort (Covasna County).

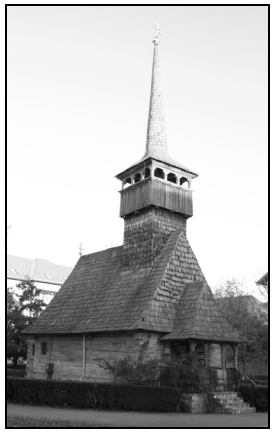


Fig. 13. Wooden Church (XVIII Century) from Letca Village (Sălaj County) was rebuilt in Oradea in 1991 (University campus).

B. Those built after 1990 that show great architectural diversity and may be grouped in **a)** and **b)**.

a) According to the degree of keeping the model specific to Maramureş they may be:

- those keeping the architectural line, the differences resulting from the dimensions, usually higher than the traditional ones: Bârsana (fig, 5; 57 m higher) and Săpânța (fig. 6; 78 m higher). One notice that in the villages of Maramureş where new wooden church are being built, the style of Maramureş is being kept, preserving the architecture elements, yet they are extremely generous in competing as regards the height (who has the highest wooden church), reaching record values of 57-78 m for a wooden construction;

-those combining the style of Maramureş with influences from other architectural styles (fortunately the examples are rare).

b) According to the place where they can be built, they may be:

- within the hearth of the Maramureş village, this being the ideal situation for keeping the image of the Maramureş Land *in situ* (fig. 7);

- outside the area of Maramureş, by spreading the architectural model beyond the regional limits, being a situation produced by the desire of some persons or institutions of having such "*architectural jewellery*" at home. Unfortunately, from our point of view this variant is the most dangerous for the approach of keeping and preserving a specific architectural style. On the one hand "the export of the architectural style" outside the limits of the regional area means dilution of the symbolic power of the Maramureş Land, by an attempt of cultural levelling specific to globalization. On the other hand a conflict arises between the imported architectural style of Maramureş and the local, native one. For example, building some churches in the style of Maramureş in the counties of Bihor, Sălaj, Cluj or Alba is an aggression towards the native specific architectural style of the mentioned areas. A speechful example in regard to this is the case in the Băile Felix resort, where wooden churches in the style of Maramureş were built (fig.8), when the ethnographic and patrimonial dowry of Bihor County includes specific wooden

churches (fig. 9). If the one church was built right from the beginning on the basis of a project inspired from the Maramureş traditional architecture, the case of the second one is really funny. This church was moved from the Brusturi village of Bihor (therefore a wooden church in the style of Bihor) where it was displaced from in the current location. Out of the information obtained from various reliable sources it results that upon rebuilding, the craftsmen hired for this purpose, who were native of Maramureş, have done what they know best. They rebuilt the church not according to the typology specific to the region of Crişana, but to their own ideas, making an imposing building in the style of Maramureş. The other case: in Cluj-Napoca built in 2010 (fig. 10), in Oradea (fig. 11), in Covasna Resort (fig. 12) etc. In the same context the typically wooden church from Sălaj County (Letca Village) was moved in Bihor County (fig. 13).

In the same context, the architectural style of the Maramureş gates is more frequently exported outside the limits of the Maramureş area (fig. 16). Unfortunately, the new buildings are rich in "invented" symbolic elements and that have no connection with the symbolic meanings of the genuine Maramureş gate (fig. 17). The same elements are to be encountered in the case of the new gates of the Maramureş area (fig. 16).

Both in the case of churches and of the wooden gates, when it comes for the contemporary period (after 1990) two major categories in point of view of keeping the specific architectural line can be identified:

-keeping the architectural line and the specific symbols (fig. 5, 6, 7, 15);

-partly keeping the architectural line and the specific symbols, but adding some decorations that distort their artistic value (fig. 12, 16, 17).

We analyzed only two of the most representative elements that determine the specificity of an ethnographic region that is part and parcel of the Romanian cultural area. Unfortunately, the negative examples are more and more seldom and the good practices not being financially and legally supported are more and more rare.

Fig. 14. Wooden gate from Budesti Village (Maramureş) with 3 pillars according with traditional architecture.

Fig. 15. Wooden gate from Sârbi Village (Maramureş) with 5 pillars according with traditional architecture.

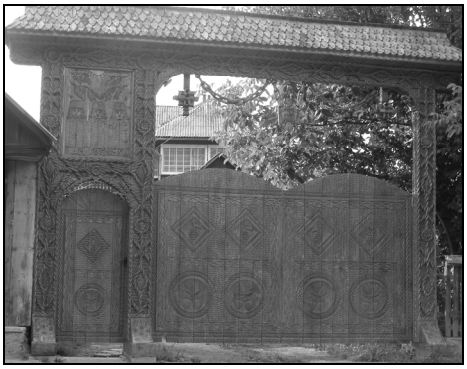


Fig. 16. Wooden gate from Botiza Village (Maramureş) with rich decorations and a lot of new elements.

Fig. 17. Wooden gate built in Bihor County with rich decorations and a lot of new elements, combined with cement fence.

5. CONCLUSIONS

In conclusion, we may state that displacing some traditional architecture elements out of their original area and implementing them into areas presenting different ethnographic features is an approach of destroying their symbolic meanings and specificity through generalization and implementation in a non-native area. It doesn't concern the open-air regional museums (Bucharest, Sibiu, Cluj-Napoca etc) that group original and representative elements for the Romanian area (with pieces displaced before 1990), but the implementation on behalf of some institutions or natural persons of some non-native elements to the detriment of native genuine and traditional ones. The effects of such approaches will be devastating for the local specificity, distorting reality and making it impossible for the young generations to distinguish the peculiarities of the place they were born or live in. It is a process specific to globalization and cultural levelling by: decrease of the interest for the source areas, thus occurring the possibility of admiring an architecturally distorted church of Maramureş, right in the centre of Bucharest, Cluj-Napoca (fig. 10), in Covasna (fig. 12) or Băile Felix (fig. 8). Who was wrong in this case? the local authorities who gave the building licenses? the locals who approved of an implant 'foreign' to the place? or those from the source area of the church (the inhabitants of Maramureş) who did not protested against this type of '*export*' of heritage elements and ideas that should not be identified but within their source area? etc. We think that in such cases, the legislation regarding the protection of the architectural, ethnographic and cultural heritage should be stricter, more accurate and not so permissive. Under these circumstances there is a major risk with immediate effects regarding: one area losing its cultural identity by importing non-native elements; implementing some elements that import more the idea of an area than the architectural style; cultural levelling as a consequence of globalization etc. Even if the area of Maramureş is still well preserved and is the keeper of a priceless treasure of traditional architecture monuments, being in the same time source of inspiration for the construction of some buildings of the same type outside the limits of the mentioned regional area, the immediate danger is the one resulted from generalizing and 'exporting' these symbolic meanings and some local identity elements.

ACKNOWLEDGMENTS. This contribution presents results from research projects: PN II 751/2007; SISAT 2007. The authors acknowledge to anonymous reviewer for their thoughtful suggestion and comments.

R E F E R E N C E S

1. Cazelais, N., Nadeau, R., Beaudet, G. (2000), *L'espace touristique*, Presses de l'Universite du Quebec.
2. Cocean, P. (1997), *The Land – A Typical Geographical Region of Romania*, RRG., Tome 41, Edit. Academiei, Bucureşti.
3. Cocean, P., Dezsi, Şt. (2001), *Prospectare şi geoinformare turistică*, Pressa Universitară Clujeana, Cluj Napoca.
4. Cocean, P. (2005), *Geografie Regională*, Presa Universitară Clujeană, Cluj-Napoca.
5. Ciangă, N., Dezsi, Şt. (2007), *Amenajare turistică*, Presa Universitară Clujeană, Cluj-Napoca.
6. Dăncuş, M. (1986), *Zona etnografică Maramureş*, Edit. Sport-Turism, Bucureşti.
7. Dăncuş, M., Cristea, G. (2000), *Maramureşul un muzeu viu în centrul Europei*, Edit. Fundației Culturale Române, Bucureşti.
8. Dăncuş, M. (2009), *Muzee în aer liber, un loc de redescoperire a identității în cadrul societății contemporane*, prezentare a autorului realizată în 16 octobrie 2009.
9. Erdeli, G., Gheorghilaş, A. (2006), *Amenajări turistice*, Edit. Universitară, Bucureşti.
10. Godea, I. (2007), *Arhitectura la români. De la obârşii la Cozia*, Edit. Primus, Oradea.
11. Ilieş, Al., Ilieş, Dorina, Josan, Ioana, Grama, V., Gozner, Maria (2008), *Romanian Rural Tourism between authentic/traditional and modern/contemporary. The case of Crişana and Maramureş area (I),* in GeoJournal of Tourism and Geosites, year I, no. 2, vol. 2, Edit. Universității din Oradea, Oradea.
12. Ilieş, Al., Ilieş, Dorina, Josan, Ioana, Grama, V., Herman, Gr., Gozner, Maria, Stupariu, M., Gaceu, O., Staşac, M. (2009), *Cosău Valley (Maramureş) – Evaluation of anthropic patrimony (I)*, in Jurnal of Tourism and Geosites, year I, no. 2, vol. 2, Edit. Universității din Oradea, Oradea. Ianoş, I. (2000), Sisteme teritoriale. O abordare geografică, Edit. Tehnică, Bucureşti. GeoJournal of Tourism and Geosites, Edit. Universității din Oradea, Oradea.
13. Ilieş, Dorina, Josan, Ioana (2009), *The tourist complex spa Băile Felix - Băile 1 Mai – personality, distinctivness by protection versus depersonalisation and non-specific by globalisation. Conceptual and practical aspects regarding the role of the natural and anthropic setting in tourist fitting (I),* in GeoJournal of Tourism and Geosites, year II, no. 2, vol. 4, Edit. Universității din Oradea, Oradea.
14. Ilieş, Gabriela (2007), *Ţara Maramureşului. Studiu de geografie regională*, Presa Universitară Clujeană, Cluj-Napoca.
15. Ilieş, M. (1999), *Ţările - regiuni geografice specifice României*, Revista Română de Geografie Politică, Year I, no.1, Oradea.
16. Pop, P.Gr. (1979), *Maramureş. Hărți turistice județene*, Edit. Sport Turism, Bucureşti, 1979.
17. Pop, P. Gr. (2006), *Carpații și Subcarpații României,* Presa Universitară Clujeană, Cluj-Napoca, 2006.
18. Ilies, M. (2007), *Amenajare turistică*, Presa Universitara Clujeana, Cluj Napoca.
19. Surd, V. (coord) (2005), *Amenajarea teritoriului şi infrastructuri tehnice*, Presa Universitară Clujeană, Cluj-Napoca.
20. Timothy, D.J., Boyd, S.W. (2003), *Heritage Tourism*, Prentice Hall, London.
21. Toth, B. (1969), *Metode în cercetarea tipologică şi stilistică a arhitecturii populare*, în Satu Mare, Satu Mare.
22. Veal, A.J. (2006), *Research Methods for Leisure and Tourism: A Practical Guide*, Financial Times-Prentice Hall/Pearson Education, Harlow.
23. Wall, G. (1993), *Towards a tourism typology*, in J.G. Nelson, R.W. Butler and G. Wall (eds), Tourism and Sustainable Development: Monitoring, Planning, Managing, 45-58, Waterloo.

STUDIA UBB GEOGRAPHIA, LVI, 2, 2011

CULTURAL LANDSCAPE ELEMENTS IN THE VAȚA AREA (METALIFERI MOUNTAINS)

CAMELIA-INA GAVRA[1], ILEANA-CRISTINA CRĂCIUN[2]

ABSTRACT. – Cultural Landscape Elements in the Vața Area (Metaliferi Mountains). The article highlights the types of constituent elements of the cultural landscape of the Vața area (located in the Brad – Hălmagiu corridor from Apuseni Mountains), as a result of the constant changes of the past, induced by actions and interactions of natural and human factors. Natural elements such asrelief in the form of depression and high hills, a moderate temperate continental climate, mountain areas, rich soil and subsoil resources and mineral and thermal wate were a favorable environment for the development of rural communities in the area. Today, they still bear the visible imprint of the past through traditional household image and also by traditional activities practiced harmoniously intertwined with those of the present time.

Keywords: *Vața, rural cultural landscape, elements of cultural landscape*, *springs, traditional.*

1. INTRODUCTION

The term cultural landscape increasingly managed to arouse interest in different fields: scientific, political, legislative, administrative, and not least in public concern, but not widely understood and applied, and yet there were no conflicts in defining terms. Therefore it requires the acceptance and use of meaning (definition) granted cultural landscape of the European Convention on the landscape, it means "*an area as perceived by people, whose character is the result of the action and interaction of natural factors and / or human"* (The European Landscape Convention, 2000).

Natural characteristics (physical) of the place, means the natural aspects such as local climate, soil, water resources, mineral resources, etc. These 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 cultural landscape.

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.

Built landscape increasingly replaced the natural one, every settlement, every clearing farmland to get new content have changed the original landscape, altering temporarily down interaction between humans and the environment, thus making up the region's character in the expression of how the natural and cultural elements of landscape combine to differentiate the areas between them, giving unique place.

[1] *Babeş-Bolyai University, Faculty of Geography, 400006 Cluj-Napoca, E-mail: camelia.gavra@geografie.ubbcluj.ro*
[2] *Babeş-Bolyai University, Faculty of Geograph, 400006 Cluj-Napoca, E-mail:, E-mail: ileana.craciun@geografie.ubbcluj.ro*

2. METHODICAL APPROACH

Register of cultural landscape components method is specific for cultural landscape research and offered through its general in this case, the basic structure for analyzing and classifying the functional point of view of cultural landscape elements in the Vața area, through the systematic recording of its elements in a register hierarchically structured. Register of cultural landscape components is a collection of typical cultural landscape elements and forms of land use types in a given space.

Also register is designed to "*facilitate the mapping and assessment of specific regional characteristics"* (Glink C., Meyer Has-Heinrich, Schottke Maja, 2007, p. 11) in order to better compare them and not least for an easy determination of the types of cultural landscapes.

The register contains sections that are highlighted by functional approaches and / or practical information on geographical coordinates, dimensions, structures, features, functions, criteria for evaluation of cultural landscape elements, etc.

Although a register of cultural landscape components do not present a complete and holistic picture of the area studied, it provides conclusive and accurate information about a limited number of dominant elements, carefully chosen to emphasize the specificity of a specific cultural landscape.

3. ADMINISTRATIVE LOCATION AND GEOGRAPHICAL POSITION OF THE VAȚA AREA

The Vața area, located in the Brad – Hălmagiu corridor from Apuseni Mountains, through its geographical position, has a favorable development of rural communities in the area due to natural factors such as relief in the form of depression and high hills, a temperate continental moderated mountain climate and the rich resources offered by the soil and subsoil. Also, on the administrative point of view, it comprises thirteen villages - Basarabasa, Birtin, Brotuna, Căzăneşti, Ciungani, Ocişor, Ociu, Prăvăleni, Prihodişte, Târnava de Criş Tătărăştii de Criş, Vața de Sus şi Vața de Jos -, located on an area of 3570 hectares (www.ghidulprimariilor.ro).

As a result of the constant changes in the past, induced by actions and interactions of natural and human factors, mainly the study area showing the type of rural landscape; the historical cultural elements, though dominant, are intertwined harmoniously with those of today, the countryside becomes space deployment of traditional agricultural activities (animal husbandry, crop cultivation, beekeeping, forestry, gathering berries and medicinal plants,) and of the industrial activities (processing calcite, wood, etc.), infrastructure (roads, railways, electricity and water supply and telecommunications), tourism - the exploitation of mineral and thermal springs in the Vața Spa resort, and services.

Investments in the area have absorbed relatively little of the countryside, although the agricultural component remained dominant in the landscape, making it multifunctional.

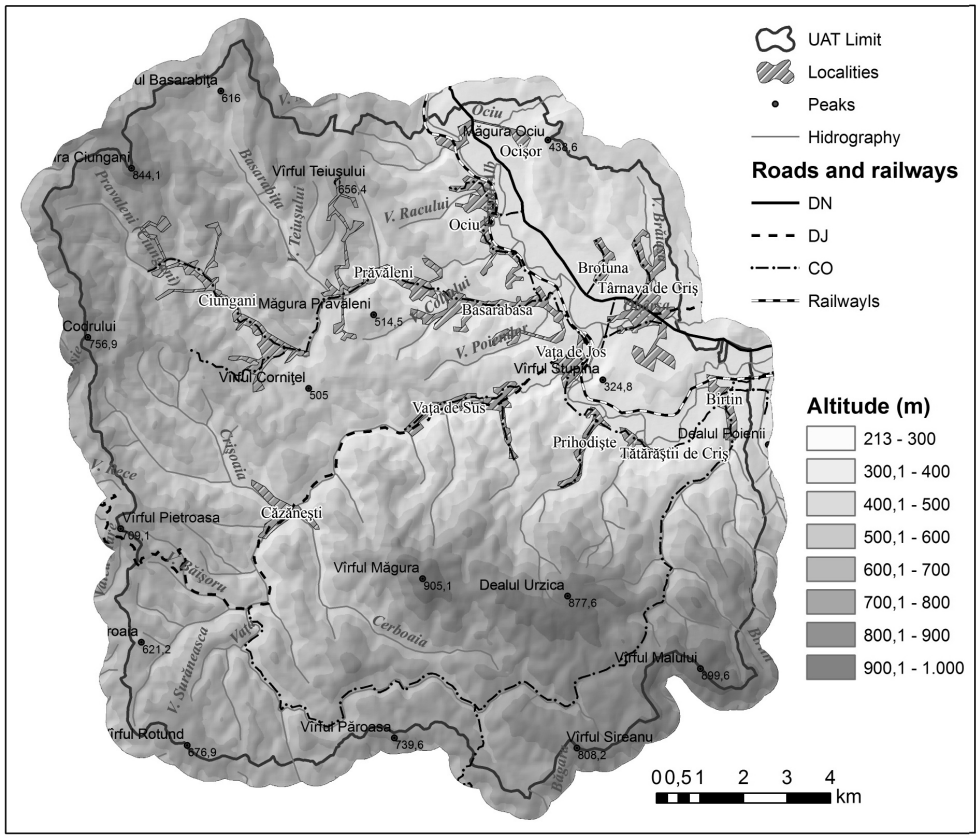
The built area has witnessed a separate development in time, specific for mountain areas with small agricultural areas.

The need for new areas of land for cattle grazing and cultivation of plants determine some members of the village to leave the old settlement and to establish new households based on recently cleared land, these have been called hamlet, if, in meanwhile, the number of households grew larger.

Today, villages, whether located in Crişul Alb River's meadow on its terraces or slopes, are surrounded by agricultural landscape (crop areas, pastures and meadows) and forestry. Types of villages scattered linear differ from those located along the Crişul Alb River, scattered in the high area, mainly composed of hamlets, groves 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.



UAT = Administrative Territorial Unit, DN = National road, DJ = County road, CO = Communal road, CFR = Railway.

Fig. 1. The Vața area – administrative location and geographical position of the Vața village.

4. 1. Elements related to housing and household

Areas occupied by housing and household elements generally show a landscape of old buildings, traditional, along which are a few recent constructions in the form of villas and apartment blocks. There are a total of 1372 (www.ghidulprimariilor.ro) households, most of them consisting of three massive buildings on three sides: house, the shed (for storing the cart, wooden barrels and farm implements) and stables for cattle. House, barn and stable long tradition in art bears the imprint of the rich wood furnishings can be seen on them. Sometimes, near the house is so - called summer house, as it being in the cellar, and next to it, fire wood is stored, all highlighting a multipurpose court, where it can be seen a stone cross, which aims to protect the household and family.

Cultural landscape elements classification in the Vața area, (after: Schmidt Catrin, p. 10.), In Kulturlandschaftsprojekt Ostthuringen unter besonderen kulturbedingten Eigenarten erfasste Kulturlandschaftselemente, 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 dwelling house	Agricultural land parcel	Asphalt road
Villa	Grassy ditch	Causeway
Block of flats	Pasture	Unpaved road
Store hay	Hayfield	King's Road
Sheed	Haycock	Path
Stable for cattle	Solitary tree	Wood deck
Summer house	Orchard	Concrete and metal bridge
Cellar		Rail road
Gate and fence		Train station
Bread oven		
Flower-garden		
Vegetable garden		
2. Elements of interest, recreation and cultural elements	**2. Elements releted to forestry and industry**	**2. Elements related to railways**
Hotel	Forest	Rail road
Hostel	Bush	Train station
Restaurant	Water mill	Barrier
Outdoor pool	Distillery	
Petrified Forest (in Basarabița)	Sawmill	
Prihodişte Cave		
Bats Cave from Braşău		
TheCure Spring of Ciungani		
School Community center		
Community center		
3. Elements with religious significance	**3. Trade related elements**	**3. Elements related to special transpots**
Church	Fair	Metal pole
Cemetery	Village store	Concrete and wood pole
Cross (on agricultural land)		Electrical /telephone cable

Households are usually surrounded with wooden fences or the new, metal fence, inside their access being made through the gates constructed usually of the same materials. Specifically for the isolated houses on the slopes is that not all fenced, with 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 stone walls, wooden, tile or metal roof and provided with crank, chain and bucket. (wells with weeps are provided with a wooden beam at one end with a bucket, and a counterweight at the other; it can be found on pasture land and are used for giving water to the cattle.

Along with these traditional bread oven (built of brick and clay, with metal doors and tile), flower garden and vegetable garden near the household, complete the entire suite of traditional elements of housing in the Vața area.

4. 2. Elements with religious significance

Churches, cemeteries and crosses belong to the the group of elements with religious significance, which can be seen in various forms in the territory, depending on location and historical period in which were built, architectural style, materials used and, ultimately, local traditions. Churches can be easily seen in the Vața area's landscape, because they are located on the highest areas.

Churches, such as those in Ciungani, Căzăneşti, Ociu, Ocişor, Prăvăleni, villages, like many places of worship in the Crişul Alb valley, were built in "*Transylvanian style with high tower, shingled roof and wooden walls without nails combine* (Pârva I., 1983, p.129). Sometimes, as in Ocişor village, near the old wooden church, dating back to 1665, *"built from thick planks of oak, with Baroque bell tower; inside could hardly be distinguished, traces of Byzantine-style painting "*, (Pârva I. , 1983, p. 134) was built a new one of more resistant materials, but on the same style.

Usualy, the cemetery is located near the church (fenced or not). In it you can see both old wooden crosses and new ones, carved in stone or marble.

Stone crosses, as an evidence of Christian faith deeply rooted in people's hearts, have sometimes another meaning than that given to the tombstones in the cemeteries. When stone crosses are placed on pasture and meadow areas they are meant to protect livestock from disease and predators. Sometimes stone crosses can be seen at the edge of cultivated land and are meant to protect them against natural disasters, or on places with historical significance, such as stone crosses at the so-called Red willow (Târnava de Criş) and Măgulicea (Ociu village) on which are engraved words in the memory of villagers who fought in the Revolution of 1848.

4. 3. Elements related to agriculture.

Agricultural elements belonging to cultural landscape, as fields, pastures, hayfields, orchards, haycock, markets, etc. are particularly visible outside the village (excluding markets) and belong to three types of surfaces: the arable land (quite low in mountain area), pastures / meadows, and orchards.

A special feature is that, arable land is highly fragmented; plots are very narrow (sometimes 4-5 meters wide) and can be square, rectangular, trapezoidal, etc., separated by stakes or grassy ditches. Are mainly grown: maize (Zea mays), potato (Solanum tuberosum), fodder beet (Beta vulgaris), alfalfa (Medicago sativa), white clover (Trifolium repens) and red clover (Trifolium pratense).

Pastures and hayfields occupy land areas at higher altitudes, whereare distinguished, especially in autumn and winter, many haycocks, intended for animal consumption in winter and sometimes solitary trees, visible in the distance.

Orchards, including plum tree (Prunus domestica), apple tree (Malus domestica), pear tree (Pyrus communis), walnut (Juglans regia) and cherry tree (Prunus avium), plays an important role in this area, over time, were moved away from areas occupied by buildings, often on hills facing south, replacing pasture or cultivated land.

4. 4. Elements related to forestry and industry

Regarding forestry and industry related elements, are noted mainly forests, bushes, solitary trees, water mill, distillery, wood processing factory, etc.

Forest landscape is dominated by deciduous forests, including stands beech (Fagus silvatica), oak (Quercus robur), hornbeam (Carpinus betulus), oak (Quercus petraea), etc., and those mixed with conifers, of which often being met are: fir (Abies alba) and spruce (Picea excelsa), a discordant note is the specific vegetation landscapeCrisul Alb river floodplain, as poplars (Populus) and various types of willow (Salix goats). Regarding the areas occupied by forest, there are two traditional ways of forest exploitation, by grazing and wood exploitation and processing (in sawmill), the latter being one of the main crafts practiced by the local population. Wood is used mainly to obtain charcoal, timber for construction and as firewood.

However, along the river can be observed traditional watermills for grain, some of them abandoned, others still being in operation, like the water mill on the Ciungani brook - Basarabasa village.

Distillery (locally called bucket of brandy) is used by locals to obtain alcohol from various types of fruit and it consists of a copper boiler, (partially enclosed in a brick kiln and clay) and a cooler in which is the pipe that is produced alcohol.

4. 5. Elements related to transport routes

Also, in close correlation with the elements of housing, household and economy (industry and agriculture) in the cultural landscape of Vața area, are highlighted various types of transport elements. Road transport routes are observable in the landscape in various forms, from simple path, to the asphalt road along with some related works of art (sometimes one can distinguish wood and stone bridges, which is often replaced by those made of more resistant materials: concrete, metal).

The main access road (E79) forms a line connecting the village structure, each village having access to it through secondary roads, most notably the so-called King's Road, which linked Vața Băi to Săvârşin (by village Căzăneşti), which is a evidence that the curative waters were known and used by the King of Romania.

The only railroad which crosses the area is that, that connects Arad and Brad cities and all buildings necessary for its operation (railway station, etc.) are clearly visible in the landscape.

4. 6. Elements related to special transports

Special transport related elements are visible in the cultural landscape of areal mentioned above, in the form of metal poles for high voltage, low voltage (concrete or wood) and the form of electricity transmission cable and telephone cables, supported by them.

4. 7. Elements of interest, recreation and cultural elements

Moderately continental temperate climate due to the of mountain areas and sulfur, sodic, magnesian, calcium mineral water and the thermal water (35-38,5 °C) was developed, under the shelter of the surrounding forests, Vața Băi resort.

Cultural landscape is so filled with tourist attractions, recreational and cultural elements, which are clearly distinguishable in the Vața area through its specific installations and constructions such as electrotherapy facilities, those for warm water in tanks and valves cold and catering (hotels of two, three and four stars, hostels and restaurants), but also those for education, shows and village meetings (school, library, community center).

Its curative waters are used to treat degenerative rheumatic diseases and neurological, peripheral and central nervous system, gynecological, dermatological, respiratory, cardiovascular and endocrine diseases through warm mineral water baths, to the cold outdoors and to the electrotherapy.

It can be distinguished also unique elements of interest, with great specificity, such as: Petrified Forest from Basarabița, (between Ciungani and Prăvăleni villages), Prihodiște Cave (historical monument), Bats Cave from Brașău and The Cure Spring of Ciungani However, although the area's attractions are not yet sufficiently exploited in terms of tourism.

5. CONCLUSIONS

Although the Vața area still retains many characteristics of traditional and typical regional features, traditional cultural landscape images are becoming increasingly impregnated with other landscape images. Social, economic and political change, after 1990 and especially recently boom in the construction industry have affected the images of traditional rural areas (especially those built).

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.

R E F E R E N C E S

1. Cocean, P. (2008), *Geografia regională a României*, Presa Universitară Clujeană, Cluj-Napoca.
2. Fellman, J., Getis, A., Getis Judith (1990), *Human Geography. Landscapes of Human Activities*, University of Illinois, (Urbana Campaign), USA.
3. Glink, C., Meyer, H-H., Schottke Maja (2007), *Historical Cultural Landscapes in Romania. Mapping and registration of endangered traditional cultural landscape elements in Transylvania*, in Romanian Review of Regional Studies, volume III., Number 2, Presa Universitară Clujeană, Cluj-Napoca.
4. Koreleski, K. (2007), *An Outline of the Evolution of Rural Cultural Landscapes in Poland,* in Romanian Review of Regional Studies, volume III., Number 2, Edit. Presa Universitară Clujeană, Cluj-Napoca.

5. Netea, V. (1977), *Munţii Apuseni. Muzeu istoric şi Pantheon al poporului român*, Edit. Sport-Turism, Bucureşti.
6. Pârva, I. (1983), *Drumuri în Ţara Zarandului*, Edit. Sport-Turism, Bucureşti.
7. Schmidt, Catrin (2005) *Kulturlandschaftsprojekt Ostthuringen-Historisch gepragte Kulturlandschaften und spezifische Landschaftsbilder in Ostthuringen,* FH Erfurt, FB Landschaftsarhitektur und Regionale Plannungsgemeinschaft Ostthuringen.
8. Stoica, Flavia, Schreiber, W. (2008), *Peisaje culturale istorice*, Edit. Argonaut, Cluj-Napoca.
9. *** www.ghidulprimariilor.ro

Note: "Invest in people!" PhD candidate in "Project co-financed by European Social Fund through Sectorial Operational Programme Human Resources Development 2007-2013".
The authors wish to thank for the financial support provided from programs co-financed by The SECTORAL OPERATIONAL PROGRAMME HUMAN RESOURCES DEVELOPMENT, Contract **POSDRU 6/1.5/S/3 –** „Doctoral studies: through science towards society".

STUDIA UBB GEOGRAPHIA, LVI, 2, 2011

THE LANGUAGE OF TOURISM WEBSITES

SILVIA IRIMIEA[1]

ABSTRACT. – The Language of Tourism Websites. The study looks at the language used on promotional tourism websites, an area which has been less investigated from the linguistic point of view. The study examined the descriptions of destinations and hotel information offered by *mrandmrssmith.com*, a luxury website aimed at a high-class audience, in an attempt to highlight those discriminative features of the language which derive from the use of hypertexts and other web-specific constraints. The investigated characteristics range from: conciseness, brevity, use of headings and information grouping to rhetorical devices. The latter include: key words, alliterations, metaphors, unusual collocations, intensifying collocations, superlatives, pre-modified collocations, 'languaging' and personalization.

Keywords*: tourism websites, the language of tourism websites, web design, rhetorical devices.*

1. INTRODUCTION

Many linguists have examined the language of tourism and have pointed out the features that differentiate it from other specialized languages, most of which derive from its promotional nature. Although many researchers have analyzed linguistically guidebooks, leaflets or brochures, little has been written about the language of forms of *discourse* that have emerged and that characterize tourism, such as: the language of tourism websites, the language used in trip reports and reviews, etc. Following these needs, the present study has been focused on the language of tourism websites.

We live in a world in which the tourism industry is increasingly using e-commerce devices (Buhalis & Law 2008) and, as a result, tourism organisations need to adapt to these changes and develop services that address the individual needs of the tourists. Pre-internet tourism suppliers were constrained to use intermediaries, such as tour operators and travel agents for the distribution of their products, but nowadays Information Communication Technologies have boosted to such an extent that people can access directly the information related to their holiday-planning on the internet. Suffice to say that if these individuals like what they see on a tourism website they undergo a transformation from simple viewers to customers, i.e. tourists. In order to appeal to these peoples' eyes and mind the websites must be designed properly and send out the right linguistic message.

Tourists are no longer passive customers or consumers as they used to be a few decades ago, they have become more experienced, educated, destination-oriented, independent, more flexible and more "green", consequently all these aspects must be taken into account when the tourism product designers plan out a web campaign and write for the web. In addition,

[1] *Babeş-Bolyai University, Faculty of Geography, 400006, Cluj-Napoca, Romania, e-mail: s_irimiea@yahoo.com*

websites should incorporate in their overall linguistic design the multimedia component, since tourism information requires an extensive use of photos and graphics, which convey a tangible image or experience to travel planners.

The focus of this study is on the way the information and the language provided on tourism websites is used to promote accommodation in different areas of the world. With this end in view the present study examined the descriptions of destinations and the hotel information offered by *mrandmrssmith.com*, a luxury travel website, because the language used by it to present the destinations and accommodation is a suggestive example of a highly sophisticated and extremely persuasive language, in particular due to the high-class target audience of the website. A website designed to reach out to such a demanding clientele would never resist on the market without a *professional use of language*, because classy customers never opt for an offer which sounds good to ordinary people

2. THE METHOD

The corpora selected for the linguistic analysis is based on the descriptive passages from the *Mr and Mrs Smith* website (*mrandmrssmith.com*). The destination and the hotel information from the tens of web pages have been extracted in Word format and then analyzed qualitatively.

Tourism website texts, particularly those illustrating a type of accommodation or destination, should be rather short and quickly entice the reader without boring him with superfluous information. This limits the range of linguistic techniques used, from amongst which we shall deal with a few basic ones.

3. ONLINE TOURISM. TOURISM WEBSITES

The evolution of information technology has changed our way of life and doing business, especially since the Internet has become an accessible tool for all. The Internet is a powerful tool for any organization because e-marketing and e-commerce offer an amazing number of advantages, such as: reduced advertising costs, the capacity to store an almost unlimited amount of information and the gigantic market coverage. That is why any business should also be virtually represented on the World Wide Web, especially one based on information and services like tourism.

Compared with the traditional tourism services, online tourism is more flexible, convenient and more consumer-focused. It allows tourists to plan their holidays whenever they have time, to access personalized information, to purchase package tours from the pleasant comfort of their home and these are only a few of the advantages a tourism website can offer.

Tourism is an industry which is highly competitive and very dependent on marketing and promotion. That is why it is essential to promote travel organizations on the Internet. Besides, these websites can attract tourists by manipulating them the way the advertising industry does.

The key to transform random users into loyal customers is a strategically created website which, on one hand, conforms to the principles of web design and harmoniously combines the elements of web design, and on the other hand, presents content based on enticing images and hypertexts. The latter are designed on the basis of the linguistic techniques which are specific to the promotional language of tourism and which represent the backbone of persuasive texts.

The aesthetic value of a website for tourism has a substantial relevance because the first impression of a user will always rely on the design and the visual elements of the website. It is this aspect that will contribute to the decision of the potential customer regarding whether to continue navigating on the website and explore the content or to abandon the website due to its dull, overwhelming or unfriendly design. On the contrary, if the website has an audience-focused design, there is a high probability that the targeted viewer will be pleased by it and will consider the website for planning his trip. However, it is not enough that the website guarantees a good look and feel. In order to be user-friendly, and not to confuse the user with unorganized information, the website must also have unity. Moreover, by establishing a focal point and hierarchizing the information, the user's attention can be directed to any point on the web page, thus emphasizing the most significant and desired aspects. Finally, contrast and balance are two other co-substantial features which any commercial and market-driven website should rely on, or else the purpose of the website will not be achieved due to the lack of a proper overall homogeneity.

It is essential that the elements of the website be skilfully incorporated on every page in order to form an artistically pleasing and appealing image. Every detail, from colour, and font type to the placement or incorporation of menus and navigation bars is necessary for the achievement of a pleasant overall look and feel.

4. HYPERTEXTS

Holidays cannot be inspected for purchase as we do with clothes by trying them on and, since expectations are built on a product representation which cannot be seen before the actual experience takes place, tourism websites allow users to explore an interactive multimedia site to obtain the required information about a destination. However, tourist organizations need to sell the same product on different markets and to different customers, therefore, different types of information need to be provided on one and the same site.

Very much like in the case of web design, the first step is determining the target audience and the second is presenting the product in adequate and convincing linguistic ways. In the creation and use of such a persuasive language, verbal and iconic elements need to be properly interwoven and this combination has an even greater potential when tourism texts are uploaded on the Internet and thus receive the name of *hypertexts*. The most important feature of hypertexts is that they are not created to be read in the traditional way. Web writing is different from writing for printed matter in that the information is selected and designed to attract attention by breaking up the process of predictable, conventional reading. While traditional texts are structured hierarchically with co-textual references, in the particular case of hypertexts there are *internal* and *external links*. An internal link is a reference or navigation element on a page to another section of the same page or to another page of the same website, whereas an external link directs the user to another website.

These links reflect a communicative choice of the web designer and render the impression of total control over what link may be followed so that the reader receives an (apparent) active role when he scans these texts. For instance, on the Mr and Mrs Smith website (Fig. 1) the customers can choose a hotel according to their preferences and when the details of the hotel are indicated, they can click on the hyperlink of the hotel's location(which is usually indicated through underlined words), and, thus, they are directed to an internal page with information about the destination; the customer can also click on the "view map" link to view the exact location of the hotel on the map, which is actually an external link because the localization is provided on another website powered by Google.

Another important characteristic of hypertext is the use of descriptive *sub-headings*. Breaking up the text with sub-headings allows the website visitors to easily see what each section of the page is about. The main heading on the page should provide a brief overall view of what the page is about, while the opening paragraph should give a brief conclusion of the page. Similarly, on the page various sub-themes grouped under sub-headings can be quickly read through. More importantly, the sub-headings should group one-page content into logical groups to allow site visitors to easily access the information that they are after.

When a person is looking for hotels, the "Mr and Mrs Smith" website presents each of these with the hotel's name as a main heading and with several sub-headings which facilitate the navigation, such as: Style, Setting, Need To Know, Food & Drink, Also Worth Knowing and Book Online. There is one more aspect of hypertexts worth mentioning before moving on to the linguistic analysis, i.e. text *alignment*. Left-aligned texts are easier to read than justified texts because they do not involve looking for the next word due to the uneven space between words. Right-aligned and centre-aligned paragraphs are not a good choice either, because the human eye always looks for the beginning of the next line. The analysed website has rigorously applied this rule and has user-friendly, left-aligned bits of texts.

Fig. 1. Internal and external links on mrandmrssmith.com.

The language of tourism websites, based on both iconic and verbal elements, is rather similar to that used in a general discourse because it represents a communicative interaction between specialists and non-specialists. The most distinctive feature of this language is probably the *specific lexis* since lexical items represent the most reliable evidence of the underlying linguistic strategies. The aim of the present study is, henceforth, the analysis of the lexical-discursive features of the language used for web promotion.

5. THE LINGUISTIC ANALYSIS

5. 1. Why is 'tourismese' so special?

Although tourism represents the largest industry in the world, it has been very little investigated from a linguistic point of view, which is rather strange, since without its specialized form of discourse illustrated in promotional and informative materials there would be no tourism the way we know it today.

Most of the people would think "tourismese", the language used for tourism purposes, is nothing but the vocabulary of "charter flights", "self-catering", "tour escorts" and the stories of tourists coming home, but since tourism is such a multi-faceted domain its language means obviously a lot more.

It would be shallow to consider that this special language is based only on one type of vocabulary employed only by the tourists. This language requires a process of socialization for those who generate it and those who translate it, and these people fall into three categories. First, there are the experts who address other specialists to discuss professional issues, there are also the specialists who address non-specialists for explaining them a certain specialized notion and then there are specialists who address a wide audience of non-specialists to provide them with profession-related information. The very first category will evidently make a frequent use of specialized vocabulary, because the addressers and addressees probably share a considerable amount of knowledge. In the second case, terms may be explained when used for the first time, especially when it comes to manuals. The third case, on the other hand, will require a wider use of everyday vocabulary in order to reach a large audience. However, this may contain specialized terms as well, particularly words from English for general use which suffered a process of specialization.

Other aspects taken into account when defining the lexis of this language are the types of tourism (leisure, business or personal), the market segments (cultural tourism, sport tourism, health tourism, agrotourism, etc), the variety of English (British English, American English, etc) and, of course, the genre (magazine article, website article, guidebook, brochure, telephone conversation, trip report, reviews, etc).

Regardless of these aspects, the language of tourism is nothing less than a means of communicating and advertising. I will not explore the way in which the factors of communication and the language functions occur in this area, because that does not differentiate English for Tourism from other ESPs. Instead, I will focus on the various techniques that tourism discourse takes advantage of in order to lure the clients.

The language is the most powerful tool tourism can use in order to sell services and, although it gives the impression that tourists have all the freedom when planning their vacation, they are most certainly manipulated in one way or another.

Let us examine which are the underlying mechanisms which produce very different effects in the reader and that are skilfully used by copywriters and marketing specialists to promote destinations and services.

5. 2. Keywords

The use of specific keywords in tourism-focused writing is a very effective technique of influencing readers/viewers, who most often seek authenticity when planning a trip. In order to create a relationship of authenticity between the tourist and what he or she would see, key modifiers such as “authentic”, “traditional” or “real” are frequently placed in the descriptions even if the experiences they describe might only be pseudo-authentic. At the same time, the tourists’ interest is also captured by the *unfamiliar* since they want to visit what they do not have access to at home. This (positive) evaluative language expressing diversity can be achieved through the use of *superlatives* or *keywords,* which present an experience through rose-tinted glasses and often depict the exact opposite of the tourist’s, frequently, ordinary home. These keywords correspond to different values as shown in table 1.

Rhetorical keywords

Table 1

Values	Keywords
Novelty	exotic, different, adventurous, new, ultramodern, futuristic, latest
Preservation	unspoilt, virgin, untouched, natural, wild
Continuity	tradition, unsophisticated, timeless, unfading, unchanging, traditional
Distance	remote, faraway, foreign, isolated, secluded
Exclusiveness	unique, exclusive, one-of-a-kind, exceptional, extraordinary, unconventional
Attractiveness	fascinating, picturesque, magnificent, beautiful, colourful, spectacular

In order to understand how the concepts of *authenticity* and *difference* were recreated through the language of the selected corpus let us examine the following table based on the most frequent keywords:

Keywords

Table 2

Values	Keywords
Novelty	intriguing, modern, exotic, ultramodern
Preservation	virgin, unspoilt, pristine, immaculate, unperturbed, wildlife, back-to-nature, peaceful, tropical-flavoured
Continuity	traditional, native, timeless, classic, aboriginal
Distance	remote, retreat, faraway, distant
Exclusiveness	ultimate, awe-inducing, one-of-a-kind, unique, rare, quirky
Attractiveness	glamour, wanderlust, fashionista, delicious, stylish, perfect, fabulous, gorgeous, irresistible, luxury, elegance, delight, breathtaking, brilliant, classy, world-class, glorious, atmospheric, vibrant, balmy, shimmering, idyllic, picturesque, serene, glitzy, seductive, astonishing, passion, soul-soothing, awe-inducing, attractive, classic-meets-art, gourmet, sensual, fairytale, blissful, panoramic, magnificent, luscious

All positive terms contained by the corpus seem to transmit a sense of euphoria for the promoted services and a sense of distinctiveness and authenticity. The most frequent keywords of this corpus seem to be the ones which confer attractiveness to the descriptions. This is probably because of the targeted audience, composed largely or exclusively of prestige tourists for whom the idyllic panoramas and elegant interiors are a must. “World-class”, “classy”, “gourmet”, “elegant” and “stylish” are also keywords which identify with the demanding and exclusivist clientele. It can be also noticed that these keywords are not the usual ones: compounds such as “classic-meets-art” and “soul-soothing” are adjectives specially created for such an audience which is not satisfied by the usual “beautiful” or “great” keywords. All these items clearly convey an exclusive quality to the described places and underline the promotional character of the corpus.

Such keywords are also important in the case of search engine optimization (SEO) which refers to the use of various techniques to improve a website’s ranking among the search engines thus attracting more visitors. If a certain website contains all the relevant keywords a potential tourist could type in a search engine, success is already halfway achieved.

5. 3. Figures of Speech

Promotional materials are often like poems. They embody a generous amount of figures of speech and they reach out to the readers' emotions. A figurative language attracts the attention of the readers and leads them to reflect on the meaning of the advertisement. The most frequent figures of speech encountered in the different genres of texts conceived for tourism are metaphors, similes, alliterations, puns and rhetorical questions. Their main function is to produce a striking effect on the readers which will transform them into clients.

Turning our attention to figures of speech, we can state that most of these are based on the enumerated keywords from amongst which the most frequently occurring are: *alliterations, personifications* and *metaphors*, whose role is to increase the overall appeal of the described items. Another identifiable and relevant technique of these texts is the use of *unusual collocations,* whose function, as mentioned earlier, is that of presenting unique and classy features to appeal to the sophisticated customers who do not contend with the ordinary. There is barely a noun in these texts which stands alone without an intensifier, or a superlative form or a pre-modifier, which is also a characteristic of the promotional tourism texts. Many of the adjectives used are loan-words which have the role of impressing the client and conferring a local taste, e.g. "cod ajoarriero, stuffed pimientos and dove in huntress sauce". In addition, keywords or collocations make the texts suit certain types of travellers, for instance "al fresco nature" or "pristine wilderness" used for safari tourists gives more prominence and relevance to the personalization. All these techniques are exemplified in table 3:

Rhetorical devices. Figures of speech

Table 3

Rhetorical devices	Keywords
Alliterations	green gardens; serene squares; glitzy good times; blissful beachside boutique hotel
Personifications	the sultry southern city has been igniting the passions of tango; a place serenaded with the sounds of jazz; the rumour-riddled remains of an 11th century monastery; the ocean view spreads out before you like an azure blanket
Metaphors	an unperturbed African refinement; an Andalucian wonderland; Marrakech, a shopper's paradise
Unusual collocations	tropical-flavoured fun; classic-meets-art interiors; back-to-nature vibe; perfect place for the ever-so-slightly sluggish sightseer
Intensified collocations	breathtakingly beautiful; gorgeously designed; lusciously warm waters; a very attractive old townhouse
Superlatives	on the Amsterdam's most beautiful canal; the most mouth-watering menus; Courchevel is the largest ski area in Europe
Premodified collocations	kickin' arts scene; a stone-walled wisteria-clad country inn
Languaging	the 'City of Sails' has the chutzpah of a capital city; Spain's most perfect playas
Personalization	magnificent natural spectacle; delicious seafood and excellent diving, sailing and yachting hilly hamlet's mediaeval charm; luxury self-catering ski chalets

The use of *verbs* is not very different in these texts. A very few imperatives occur, probably because the high frequency of unusual adjectives is sufficient to draw the attention of the demanding tourists and the direct invitation might be considered superfluous since that is how regular customers are lured by promotional texts. The present tense is identifiable in every text and it confers timelessness to the described item, e.g. "warthog families ferret for food, while dazzles of zebra trot past tortoises to reach the waterhole". Some passive forms can also be retrieved from these presentations but they are not an overall characteristic, e.g. "you're guaranteed holiday snaps that your friends will actually want to see". Modal verbs also represent a discriminative trait of the printed media texts and the only modal verb which appears with a significant frequency on this website is the abbreviated form of "will" in such contexts as: "Far from the tourist herds, you'll slumber on wooden decks in your own cosy swag", with the role of conveying the idea of certainty.

Although web texts transform tourist places or sites into commodities through an advertising process, the text itself needs to be *informative* in order to offer a description of the places, therefore subheadings such as "Style", "Setting" and "Need to know" are very useful for the reader both to convey information and to lure him to the magnificent landscapes.

From a semiotic point of view it is also relevant to mention the outstanding pictures which accompany promotional texts and are also part of the language of tourism: images are worth a thousand words and they intensify to a great extent whatever the promotional text expresses.

The linguistic analysis carried out on the basis of the website *Mr and Mrs Smith* shows some interesting features. These descriptive, and, at the same time, informative texts accompanied by visuals generate profound meanings in the would-be tourist's mind. However, since the main goal of these texts is not to inform but to sell, these texts clearly have a promotional and/or a marketing function. The first clue to this is provided by the widespread use of exceptional adjectives to amaze the tourists. By exploiting highly evaluative pre-modifiers, the texts become suggestive and evocative to such an extent that they trigger emotions in the web reader, who thus associates the place with values regarded as essential in modern tourism where authenticity, adventure, uniqueness and romance are the main features.

However, factual information is also fundamental and it is important to have links and relevant sub-headings, which grow the amount of information, confer interactivity and maintain the contact with the real world. It is through these elements that the potential tourist can experience an extremely effective interaction between the different codes, which thus generate a complex and stimulating experience and successfully contributes to the fulfilment of the persuasive function of the texts.

6. CONCLUSIONS

The language employed by tourism involves several aspects. Firstly, the language of tourism is a specialized language, because it underwent a similar evolution as the other specialized languages, as it is based on a specific vocabulary and it meets the requirements of specialized languages on both syntactical and lexical levels, even though not without exceptions. This language has also many features which cannot be traced in other specialized languages. Monoreferentiality is not always present in this case, since many words or collocations characteristic of tourism writing do have other connotations as well and they often appeal to the reader's emotions by means of figures of speech. The language of tourism employs specific

techniques to attract the readers, such as *languaging*, through foreign words or personalization, by directly addressing the customers. Specific keywords are a must in the language of tourism because they provide the kind of information the tourist is looking for, consequently, for example, the language should describe a 'wild' and 'unspoilt' nature if the tourist seeks adventure and preservation. However, the visuals should not be neglected either when considering such a language. Elements such as pictures, videos or colour can convey a message of their own to the customer and, finally, if they accompany tourism writing they will increase its overall effect.

The language of tourism websites, nevertheless, may differ slightly from the language of tourism, in general. The most distinctive feature is that *hypertext* is neither written nor read in the traditional way: the hierarchical structure of the text is not based on co-textual references and the referential systems are achieved through internal and external links which allow the user to be in control of his own navigation throughout the pages. Sub-headings also play an important role in web writing, since content must be grouped in logical sections to facilitate both reading and navigation. Another distinctive element is *alignment,* which cannot be justified as in the printed medium because it is tiring for the eye. Instead, left alignment is the rule as it helps the reader access the content without any difficulty. The other techniques used for tourism web writing are similar to the ones employed for printed materials. Nevertheless, it is important to take account of the targeted audience when such texts are designed, which must be short, concise and attractive.

This study, like any study of a similar length, has its obvious limits. Websites for such a field as tourism are incontestably more complex than the sample discussed here. The aim of this study was mainly to show how the language of tourism is used rhetorically in certain sections of a tourism-related website.

However, given that in this area research is scarce, more analyses should be carried on how both web design and the promotional language used influence the tourists in the choices they make. This tourism-related aspect is still new and it is constantly developing along with the use of mobile phones for booking holidays and free wireless connection areas, which will soon revolutionize e-tourism. Therefore, professionals working in the tourism industry must be informed on the new trends in e-marketing and e-commerce in order to be able to offer the tourists modern websites which reflect their constantly changing needs.

R E F E R E N C E S

1. Buhalis, D., Law, R. (2008), *Progress in Tourism Management: Twenty Years on and Ten Years after the Internet: The State of Tourism Research,* London: Tourism Management.
2. Cooper, C., Hall, C. M. (2000), *Contemporary Tourism: An International Approach*, Oxford: Butterworth-Heinemann.
3. Crystal, D. (2001), *English as a Global Language,* Cambridge: Language Teaching and Research Press.
4. Dann, G. (1996), *The Language of Tourism. A Sociolinguistic Perspective,* Wallingford: CAB International.

5. Gotti, M. (2003), *Specialized Discourse: Linguistic Features and Changing Conventions*, Bern: Peter Lang.
6. Gretzel, U., Law, R., Fuchs, M. (2010), *Information and Communication Technologies in Tourism*, Vienna: Springer-Verlag.
7. Hutchinson, T. Waters, A. (1991), *English for Specific Purposes. A Learning-Centered Approach*, Cambridge: Cambridge University Press.
8. Jafari, J. (2000), *Encyclopedia of Tourism*, London: Routledge.
9. Jafari, J. (1995), *Study of Tourism Choice of Discipline and Approach*, University of Wisconsin Stout in McIntosh.
10. Kelly, K. (2008), "*We Are The Web*", Wired Magazine, http://www.wired.com/wired/archive/13.08/tech.html
11. McClurg-Genevese, David, J. (2005), "*The Principles of Design*", in *Digital Web Magazine*, http://www.digital-web.com/articles/principles_of_design/
12. McIntosh, R., Goeldner, C. (2003), Tourism. *Principles, Practices, Philosophies*, 9th Edition, Columbus: Grid Publishing.
13. 14. Nash, D. (2007), *The Study of Tourism: Anthropological and Sociological Beginnings*, Oxford: Elsevier Science.
14. Pearson, J. (1998), *Terms in Context*, Amsterdam: John Benjamins Publishing Company.
15. Mcintire, P., (2008), *Visual Design for The Modern Web,* Berkeley: New Riders.
16. Powell, T.A. (2002), "*Web Design: The Complete Reference - Examples*", http://www.webdesignref.com/examples/colorwheel.htm
17. Powell, T. A. (2002), Web *Design: The Complete Reference,* 2nd Edition, New York: Osbrone/ McGraw-Hill.
18. Swarbrooke, J., Horner, S. (2007), *Consumer Behaviour in Tourism*, Oxford: Butterworth-Heinemann.
19. Swarbrooke, J., Horner, S. (2001), *Business Travel and Tourism*, Oxford: Butterworth-Heinemann.
20. The Economist, (2002), E-Trends: *Making Sense of the Electronic Communications,* London: Revolution. Bloomberg Press.
21. Tribe, J. (1997), *The Indiscipline of Tourism*, Buckinghamshire College, UK.
22. UNWTO, (2010), *Tourism Highlights,* 2009 Edition, United Nations World Tourism Organization.
23. Wang, P., Katila, S. (2003), *An Introduction To Web Design and Programming*, Kent: Thomson.
24. World Travel & Tourism Council, (2010), "*Economic Impact Data and Forecast*", http://www.wttc.org/eng/Tourism_Research/Economic_Research/
25. Will-Harris, D. (2000), "*Choosing & Using Type*", http://www.will-harris.com/use-type.htm

STUDIA UBB GEOGRAPHIA, LVI, 2, 2011

TOURISM AND CRISIS

P. COCEAN[1], NICOLETA DAVID[1]

ABSTRACT. – **Tourism and crisis**. The cyclic evolution of the tourism phenomenon involves phase shifts between growth periods and stagnation or decline time intervals in which the catalytic factors diminish or cease their support for the development process, as substituted by contradictions of inhibitory effect. The financial crisis that emerged in 2008 has had great socio-economic effects, directly and indirectly manifested in the tourism industry by reducing the intensity of passenger flows, by restricting activities, and by reducing benefits. Therefore, it has determined the reorientation of promoters, the reform of strategies, and numerous changes in tourist market supply. Romanian tourism, which has been characterized by a prolonged identity crisis, experiences even more acutely the adverse impact of the crisis, its resilience being affected by low-level efficiency and stability parameters.

Keywords: *tourism, crisis, tourist infrastructure, romanian tourism optimization measures, the resilience of tourism phenomenon*

1. PREMISES FOR THE ONSET OF TOURISM CRISIS

Like any other area of human activity, tourism does not have a linear, continuous upward trend, but rather a convulsive, spasmodic, asymptotic one, influenced by many catalytic or inhibitory factors. The share of their action is erratic, at certain optimal times, the favourable factors absolutely dominating, fact that gives a positive inertia to the system and leads to its spatial development. It is the period in which tourist activities typologically diversify, quantitatively multiply, and they comply with the quality standards at higher levels. Therefore, tourism becomes increasingly competitive as compared to the other industries with which they cohabit within the same territory. Then again, at certain times, motivational factors lose their ability to support, either affected by the intervention of the major stimuli of various origins (political, economic, social, environmental) that neutralize their action, either by reducing their own lucrative energy to its depletion, or by changing their systemic structure when substituted by new, still unconsolidated factors.

By analyzing the most important cycle of tourism evolution, beginning with ancient times until today, we can distinguish a succession of positive periods of growth, separated by the same number of temporary periods of stagnation or decline. Thus, three main historical periods can be identified, in which tourism activities have known a particular development and they are: the ancient, the late medieval, and the modern and contemporary one. We have to mention that, framing these periods in time may vary from one region to another around the globe, depending on the specific historical circumstances of each site. Thus, for example, in ancient times, travelling phenomenon increases between the 4th and the 1st

[1] *Babeş-Bolyai University, Faculty of Geography, 400006, Cluj Napoca, Romania, e-mail: pompei@geografie.ubbcluj.ro; e-mail:nicoleta.david@geografie.ubbcluj.ro*

centuries B. C. in the Greek cities, when Greek civilization reaches its peaks; the same phenomenon occurs between the 2nd - 1st centuries B. C. and the 4th century A. D. in ancient Rome, this period coinciding with the maximum expansion of the Empire; it is also the case of ancient Egypt, until the 1st century A.D., before the Roman conquest. It appears that, ordinarily, all activities related to tourism developed under conditions of political stability, economic growth, as well as social and cultural progress.

Then, the dark period of the early Middle Age followed, when migrations and its subsequent general political instability proved to be repulsive factors with an extremely negative impact on tourism, determining an increased level of insecurity when travelling from one place to another. Moreover, we have to add the devastating diseases and feudal political dissolution, with negative effects that cannot be at all neglected, which will now raise new barriers to the free movement of people, fact that was always the main cause of the analyzed phenomenon. The decay phase will take several centuries (6th-11th), after which we notice a resurgence of the phenomenon through the emergence of new reasons for travelling, sometimes even disguising them in religious activities (increasing pilgrimage), economic activities and, later on, educational activities (establishing the first European universities in the 12th century).

A new growth period is marked by the emergence of the spiritual Renaissance current in the 15th century, which involved significant trade intensification and the onset of the age of the Great Geographical Discoveries (15th -18th centuries), fact that will later become the driving force of modern tourism.

During this major phase in tourism development, between the 15th century and present day, several periods can be identified, some with a distinct upward trend, followed by others of stagnation. However, we must highlight the overall visible upward trend, determined by the demographic boom along with the industrial revolution in Western Europe in the 18th century, some of its features still remaining active in some states of world, which has provided a progressively increasing number of potential practitioners. There is also worth mentioning the contribution of the socio-economic progress and of literary and artistic (romanticism) as stimuli in terms of knowledge and the need to travel.

By thoroughly analyzing those periods, we realize that they coincide with what we call today crisis, when a dominant factor or, even more commonly, a combination of factors have a considerable impact on the rhythm and intensity of a phenomenon, thus reducing its magnitude and ways of manifestations. Such an impact had the two World Wars that mainly shook the European continent in the 20th century, or the economic crisis in the years of 1929-1933, or the onset of the Cold War, between 1945 and 1989, when again the European continent was divided into two opposing political and military sides, negatively affecting tourism activities by drastically restraining the movement of people.

The crisis of 2008 comes from other causes than the previous, the involvement of political system being now much more blurred. On the other hand, the fall of the Iron Curtain, the end of the communist regimes in Europe, as well as the rapid enlargement of the European Union and NATO created optimum conditions for individuals to travel from one place to another. We may consider several causes, such as:

- the collapse of traditional capitalism, which was based on the unlimited accumulation of freight, facilities and resources in the hands of a small number of privileged people. The excessive polarization of society, which practically meant the disappearance of the middle class due to the increasing number of lower class individuals, determines an increase in the number of financially deprived people who practice tourism;

- the decline of state's social functions through drastic reduction of its own financial support due to the privatization of all enterprises and productive activities. As a result, its involvement in social programs related to, or with a positive impact on tourism, significantly decreases (i.e. the cutback of pensioners' charge-free tickets for treatment, and of students' camp tickets, etc.);

- the immeasurable development of the grasping capitalism mentality, that of „the individual against the state", which, by various methods, leads to the avoidance of the payment obligations of the individual to the state and therefore to its depletion (i.e. the scourge of tax evasion, employment under the table);

- the demographic stagnation or even decline, experienced by the countries with high socio-economic development standards, is similarly reflected in the evolution of tourist flows;

- the continuous price increase of tourism packages (programs), despite the development of infrastructure and diversification of services;

- the emergence and intensification of tourism risk phenomena (i.e. the terrorist attacks occurred in Bali, Sharm el Seich, people affected by incurable diseases such as AIDS, Ebola). In the same category we have to include the decrease in travel and holiday safety, accompanied by social unrest (demonstrations, strikes), with a direct impact on the psychology of tourists. The case of Greece is very eloquent. For example, in 2010, it registered un unprecedented wide-scale cancellation of bookings due to such type of events; the moral degradation of tourism phenomenon, due to prostitution associated with tourism „supply" in some regions and sites (South-East Asia, Latin America), and due to the encouragement of drug abuse;

- the uncontrolled expansion of tourism against other economic industries, which are vital to individuals and community (i.e. taking fertile agricultural land out of production and its use for the development of different types of tourism facilities; excessive conservation of forests so as to provide an attractive landscape).

2. KEY FEATURES OF CRISIS

Similarly to other economic and social activities, the symptoms of crisis have insidiously occurred, as mild or false dysfunctions in the everyday activities. Gradually, however, according to the cumulative causation principle, they have become visible inertial thresholds, which indicated the installation of recession in its own geosphere. We have to mention the phase shift recorded between the beginning of the general financial and economic crisis and the onset of tourism crisis, manifested later, due to the position of tourism in the socio-economic system as a secondary industry, mainly subject to the status of its other elements. It is also necessary to underline the fact that once produced, the crisis has firstly hit the activities considered secondary, less vital, among which tourism holds the top position. If food, shelter, clothing, health and education, as basic human needs, require the same attention in terms of financial management regardless of context, the other activities, often seen as hobbies, are the first "impoverished" in case of difficult socio-economic situations. Even today, the same phenomenon can be distinguished in case of population.

The most visible signs of the current tourism crisis are the following:

- the increased polarization of tourism practice in favour of tourists with sufficient financial means against those deprived of them. Much of the demand for these luxurious facilities and services quantitatively reduced;

- the reduction of both domestic and international tourist flows, of up to 30%. Therefore it causes a much lower occupancy rate and efficiency;
- a considerable reduction of about 20% to journey costs;
- the reduction in the length of trips;
- the tendency towards short-term, short-distance domestic tourism, against the international one, at medium to large distances;
- the slight damage to business tourism caused by the restriction of economic activities;
- the tendency towards practicing less expensive forms of tourism such as: hiking, weekend tourism in suburban areas, rural tourism;
- an increasing number of tourists shifting to alternative low-cost facilities and services (camping, camps, accommodation at friends and relatives);
- the bankruptcy of many tourism promoters, mostly of the smallest ones, that need to close the doors because they are unsustainable (i.e. in case of winter tourism, the crisis phenomenon has had even higher effects, considering the fact that climate change and global warming caused a reduction of about one month to the ski season in the Alps or the Pyrenees). In this context, we can distinguish the natural selection imposed by the crisis; hence, it basically determined that stakeholders with circumstantial, modest logistics lose market share;

Fig. 1. The Degradation of tourist infrastructure in Borsec resort (Photo, Șt. Bilașco).

- restricting the tourism real estate transactions, as a result of the price reduction in case of land and buildings;
- the reduction of workplaces in the hospitality industry, along with the restriction of activities. This phenomenon is followed by the gradual increase in the number of unprofessional and untrained labour force.

- the reduction of tourism share to GDP of up to 10%, in case of several countries based on such economic industry (i.e. in Italy, tourism contribution to GDP is of 12%, in Cyprus of 13%, and in Greece of 19%);

- the damage to tourism related activities, particularly in the fields of trade and services, up to restriction or even disappearance;

- the degradation of infrastructure by restriction of tourist activities and non-use of lodging and leisure facilities (fig. 1).

3. CRISIS AND ROMANIAN TOURISM

Unlike the absolute majority of the European countries in which tourism has shown a general positive trend in the last four decades, the Romanian tourism faces a dramatic collapse starting with 1980, when the isolation policy pursued by the old political system negatively affected the mobility of people, including tourists. The flows of foreign tourists diminished due to the overall lack of promotion of national tourism supply abroad, the predominant oppressive atmosphere characterizing the Romanian society during that decade, and due to the drastic reduction of tourist services (i.e. the night time recreational program was almost inexistent, the lack of food, the national television program was set to only few hours a day, the content of TV shows was under the national total control. Simultaneously, the international mobility of the Romanian tourists was reduced to minimum share, due to the extremely restrictive visa policy. There was, however, a positive element among all these negative conditions, which is the continuous increase of domestic tourists, the only market accessible to them being that of their own country. For reasons of scientific ethics, we must not though overlook the contribution of these social policies in favour of tourism practice. Consequently, all people, and especially those financially disadvantaged (pensioners, low income students), were provided treatment and rest tickets free of charge or at insignificant price. Thus, they ensured high occupancy rate all year-round in the recreational resorts and spas where unions and youth organizations of that time used to have their own facilities.

After the fall of the communist regime in the late 1989, numerous other phenomena have occurred, mainly economic and social, as inhibitory factors for the Romanian tourism. Hence, they rapidly and negatively affected tourism infrastructure and caused an even deeper and more pronounced decrease in the number of tourists.

One of these factors, with major negative consequences, was the change in the type of property, from public to private ownership. Yet, not the operation itself was disastrous, but the way it was imagined and managed. Thus, giving back many of the buildings to their former owners has been in most cases a change in the type of use; hence, the buildings, previously part of the tourist infrastructure, were practically removed from the tourism industry. As a result, a large number of villas in the traditional resorts of the country were taken out of circuit, now becoming houses or secondary residences of their actual owners.

But, even worse, was the privatization of tourist lodging facilities: hotels, guesthouses, or motels. So as to be bought for the lowest price, they have deliberately been left to decay, the former owners not at all investing in their maintenance, but rather tacitly acting towards their fast deterioration. This way, numerous protected buildings in resorts like Băile Herculane (Fig. 2), Vatra Dornei, Sinaia, Predeal, Sângeroz Băi, and Moneasa were closed, therefore, even today, two decades after the revolution, being in a poor state.

Fig. 2. Decebal Hotel in Băile Herculane resort, the victim of occult interests.

In the context of dissolving the old economic system, the accommodation infrastructure of all tourist resorts in Romania, even though it did not have the greatest quality, yet it still worked, gradually reduced its share, from 418,944 places (beds) in 1989 to 314,296 in 1991 and to 282,000 in 2002. Anyway, we can notice a slight increase in 2008, when it registered about 296,000 beds. Under such circumstances, some have practically been erased from the international tourist circuits (Băile Herculane, Borsec, Moneasa) although their aura had fascinated Europe in the 19th century and the first half of the 20th century.

The economic and social dissolution after 1990 has also affected the tourism demand, by the emergence and increase of unemployment, the rapid price growth, the decrease in the standard of living of the majority of the population, the compression of the domestic tourism demand, from 12,971,993 million visitors in 1989 to 9,603,342 in 1991, and to less than 5 million in 2009, whereas the complete opening of borders to foreign market has not manifested reversely, the number of foreign tourists obviously remaining low due to poor tourism supply and poor offer-price ratio. The deficiencies of the inadequate tourism management at all levels have become visible, with obvious negative effects.

In this context, that of a backward trend of over three decades, based on unfortunate institutional management, due to poor logistics and chronic non-professionalism of the national administration and leadership in the field, the devitalized Romanian tourism was affected by the general crisis in 2008, with little opportunities for reaction and adaptation to the new requirements. The magnitude of the crisis effect is therefore amplified by the transfer of the domestic demand to more or less contiguous countries (Bulgaria, Hungary, Greece, Turkey, Croatia), whereas the outflows remained extremely modest (less than 1.5 million tourists in 2009).

Although it has many resources that, through inspired management, may become authentic brands (mineral waters, mofettes, sapropelic mud speleological potential, hunting fund, unique ethnographical values, the myth of Dracula, etc.), the Romanian tourism holds the last position in the European Union chart, registering one of the lowest economic efficiency and share in the GDP.

4. OPTIMIZATION MEASURES FOR TOURISM RECOVERY. THE RESILIENCE OF TOURISM PHENOMENON

Tourism recovery should be approached on two different levels: first, we should consider the revitalization of other tourism interrelated industries, then the recovery of tourism industry itself.

The first measure largely depends on the regional development policies and strategies of each own state and of the European Union. They are linked with proper social policies that will ultimately have a positive impact on the tourism activities.

More important, however, are the direct and immediate measures and solutions formulated for the inner recovery of tourism industry. They intended to generate the phenomenon of resilience and compliance with the new rigors, determined by the changes in economic environment, and the obvious changes in tourism demand. Resilience provides continuity and growth to the permanent process of development.

Among the appropriate measures for the revitalization of tourism industry, we can mention:

- the price reduction of tourist packages (programs) provided to customers by various percentages, which, in certain periods of the season may go up to 50%. The adjustment of price to the real demand, seriously affected by economic recession, is a sine qua non condition for the maintenance of activities in the field. In this respect, providing a large range of tourism “low cost“ air transport opportunities is more than stimulating;

- the tendency to promote locations and services to low-income tourists, because their large number outweighs the impact of price differences. In this context, it becomes mandatory to give up using the extremely large accommodation facilities, with thousands of beds, which are no longer needed;

- tourism supply should be diversified in order to increase the addressability index. Therefore, it becomes impetuously necessary to bring out various types and forms of tourism in areas narrowly specialized, in order to ensure a high level infrastructure accessibility index;

- the reorganization of activities through high quality management;

- the aggressive, permanent actions of promotion (the audience proves to increase along with practicing online promotion);

- the predilection towards more efficient forms of recreational trips at lower costs such as: rural tourism, ecotourism, tourism, sightseeing, weekend tourism in suburban areas;

- the trend towards practicing new forms of tourism stimulated by crisis. For example, religious tourism seems to attract a significant number of visitors, psychologically affected by the shortfalls caused by the socio-economic crisis;

- loyalty discounts offered by each tourism promoter to their customers;

- the innovation of tourism supply remains a constant requirement, with beneficial effects (new tourism products, new forms of entertainment, cure or culture activities).

R E F E R E N C E S

1. Ciangă, N. (2006), *România. Geografia turismului*, Presa Universitară Clujeană, Cluj Napoca.
2. Cocean, P. (1993), *The Romanian Tourism between 1985-1991*, Revue Roumaine de Géographie, Géologie et Géodesie, 37, Bucharest.
3. Cocean, P. (1996), *Geografia turismului*, Edit. Carro, Bucureşti.
4. Cocean, P. (2010), *Patrimoniul turistic al României*, Editura Presa Universitară Clujeană, Cluj Napoca.
5. David, Nicoleta (2008), *Potenţialul turistic al Ţării Zărandului*, în Geographia Napocensis, an II, nr.2, p.95-105
6. Marga, A. (2009), *Criza şi după criză*, Edit. Eikon, Cluj Napoca.

STUDIA UBB GEOGRAPHIA, LVI, 2, 2011

CLUJ-NAPOCA. A STUDY IN ELECTORAL GEOGRAPHY. THE PRESIDENTIAL ELECTIONS, 2009

V. SURD[1], ADINA PUŞCAŞU[1], L. BRUCKNER[1]

ABSTRACT. – Cluj-Napoca. A Study in Electoral Geography. The Presidential Elections, 2009. The analysis of the population's electoral behavior has only been a subject of interest in our country after the abolition of the socialist political-social system. This paper describes the differences in and coagulations of electoral preferences in the population of the city of Cluj-Napoca during the 2009 presidential elections. There were 156 permanent and 16 special polling stations set up in Cluj-Napoca, represented in both graphical and tabular form, in a suggestive and sufficiently statistically accurate manner.

Keywords: *2009 presidential elections, Cluj-Napoca Romania, polling stations, voter turnout.*

1. INTRODUCTION

Cluj-Napoca has a residential population of 306,000 inhabitants. A seasonal student population of over 100,000 individuals needs to be added to it.

In terms of national urban hierarchy, Cluj-Napoca ranks second after Romania's capital, together with Iasi, Galati, Constanta, Craiova, Brasov and Timisoara. Due to both the high concentration of specialized services and highly qualified individuals (various university degrees, numerous medical, juridical, cultural and mass-media institutions) and its intellectual tradition, Cluj-Napoca draws its resources from the whole of Transylvania.

Even today it continues to be figuratively called a "provincial capital" (i. e., the capital city of Transylvania) (Fig. 1).

The city also enjoys a great potential due to its geographical position, at the contact between the Apuseni Mountains, the Transylvanian Plain and the Somes Plateau. It is one of Romania's main railway junction points, as well as an important center along the E60 route and the A3 motorway. Furthermore, the city is connected to all relevant European cities through its new international airport, which is expanding to this day.

From the point of view of the built-up area, the city, with a surface of almost 9000 hectares, is located on the banks of the Somesul Mic River, as well as on its terraces. The overall density consists of 45 inhabitants / hectare and 450 inhabitants per square kilometer.

2. PURPOSE

The relevance of our study consists in attempting to lay out the electoral behavior of a leading urban population in terms of collective responsibility, namely that of electing the

[1] *Babeş-Bolyai University, Faculty of Geography, 400006, Cluj-Napoca, Romania, e-mail: vsurd@geografie.ubbcluj.ro, adinnap@gmail.com, bruckner.leonard@yahoo.com*

president of Romania. In the same manner, the present study sheds light on the differences in electoral behavior at micro scalar level, analyzed in terms of the population allotted to each polling station.

3. METHOD

The main method used in the present paper is statistical analysis, correlated with cartographic and descriptive-interpretive study. A few important steps in composing the database behind the maps were: collecting statistical data about the presidential voting results in Cluj-Napoca at polling station level, the conversion of statistical data in a format that is compatible with the GIS software used, building the vector data and the final step was to combine the two data types through a GIS software.

Also, we can mention that this electoral study is the first in Romanian literature, by the level of detailed analyses.

Fig. 1. Cluj-Napoca and its influence area.

4. ANALYSIS

There were 156 permanent polling stations for the 2009 presidential elections in Cluj Napoca; these covered 279,140 voters in the first round and 279,908 voters in the second (Table 1). This number represents 91% of the residential population, meaning 68% of the total population (the sum of residential and seasonal population). Each polling station saw an average of 1789 voters cast votes in the first round and 1794, respectively 2667, voters in the second

round, if we add the seasonal population, composed mainly of students. The smallest number of voters was registered at Polling Station no. 44 ("Caritatea" Association, Mircea Eliade Street no. 22) with 790 voters, while the highest was at Polling Station no. 43 ("Radu Stanca" School, Zorilor Street no. 27) with 2512 voters.

Polling stations and the number of allotted voters, Cluj-Napoca, first and second round

Table 1

Crt. no.	Adress	22.11.2009	06.12.2009
1	*Iulian Pop* Economy College	2181	2181
2	*Augustin Maior* Technic College of Telecomunications	1960	1960
3	*Augustin Maior* Technic College of Telecomunications	1537	1537
4	*Ion Creanga* School	1156	1156
5	*Ion Creanga* School	1725	1725
6	*Ion Creanga* School	1425	1425
7	*Dumbrava Minunata* Kindergarten	1197	1197
8	*Dumbrava Minunata* Kindergarten	1813	1813
9	*Dumbrava Minunata* Kindergarten	1754	1754
10	*Iuliu Hatieganu* School	1965	1965
11	*Curcubeu* Kindergarten	1858	1858
12	*Iuliu Hatieganu* School	1607	1607
13	*Iuliu Hatieganu* School	1696	1696
14	*Iuliu Hatieganu* School	1667	1667
15	*Napoca* Technic College	1862	1862
16	Sport program Highschool	1956	1956
17	Sport program Highschool	917	1495
18	Sport program Highschool	1478	1478
19	*Eugen Pora* Highschool	1851	1851
20	*Eugen Pora* Highschool	1812	1812
21	*Eugen Pora* Highschool	1945	1945
22	*Ion Lupas* School	2216	2216
23	County Library - Manastur	1753	1753
24	*Ion Lupas* School	1498	1498
25	*Ion Lupas* School	1664	1664
26	*Ion Lupas* School	1359	1359
27	Sports Hall Cluj-Napoca	2301	2301
28	Sports Hall Cluj-Napoca	1321	1321
29	Excelence Regional Center	1991	1991
30	*Onisifor Ghibu* Theoretic Highschool	1932	1932
31	*Mica Sirena* Kindergarten	1467	1467
32	*Onisifor Ghibu* Theoretic Highschool	1436	1436
33	*Onisifor Ghibu* Theoretic Highschool	1107	1107
34	*Onisifor Ghibu* School	1293	1293
35	*Onisifor Ghibu* School	2004	2004
36	*Steluta Fermecata* Kindergarten	1527	1527
37	*Steluta Fermecata* Kindergarten	1174	1174
38	*Raluca Ripan* Institute of Chemistry Researches	1975	1975
39	*Mica Sirena* Kindergarten	1758	1758

40	*Raluca Ripan* Institute of Chemistry Researches	1953	1953
41	*Raluca Ripan* Institute of Chemistry Researches	1821	1821
42	*Radu Stanca* School	2232	2232
43	*Radu Stanca* School	2512	2512
44	*Caritatea* Association	790	790
45	*Radu Stanca* School	2230	2230
46	*Radu Stanca* School	2082	2082
47	*Scufita Rosie* Kindergarten	1205	1205
48	Constructions Faculty Section Roards - Bridges	2018	2018
49	Constructions Faculty Section Roards - Bridges	1841	1841
50	Constructions Faculty Section Roards - Bridges	1792	1792
51	*T. Popoviciu* Informatics Highschool	1339	1339
52	*T. Popoviciu* Informatics Highschool	1916	1916
53	Children Palace	1824	1824
54	*Ioan Bob* School	1802	1802
55	*G.Cosbuc* National College	1302	1302
56	*Gh.Sincai* Theoretic Highschool	1762	1762
57	*Gh.Sincai* Theoretic Highschool	1239	1239
58	Eletrotechnic Scholar Group	1955	1955
59	Eletrotechnic Scholar Group	1754	1754
60	Eletrotechnic Scholar Group	1667	1667
61	*Liviu Rebreanu* School	1859	1859
62	*Universul Copiilor* Kindergarten	1605	1605
63	*Liviu Rebreanu* School	1635	1635
64	*Constantin Brancoveanu* School	1844	1844
65	*Constantin Brancoveanu* School	1922	1922
66	*Constantin Brancoveanu* School	1845	1845
67	*Liviu Rebreanu* School	1885	1885
68	*Buburuza* Kindergarten	1277	1277
69	*Buburuza* Kindergarten	1842	1842
70	*Academia Piticilor* Kindergarten	1898	1898
71	*Academia Piticilor* Kindergarten	1690	1690
72	Ex-School Nr. 6	1667	1667
73	Ex-School Nr. 6	1739	1739
74	Ex-School Nr. 6	1871	1871
75	Ex-School Nr. 6	1269	1269
76	*Octavian Goga* School	1926	1926
77	*Octavian Goga* School	1586	1586
78	*Octavian Goga* School	1357	1357
79	Army Sports Hall	1936	1936
80	*Lumea Copiilor* Kindergarten	2150	2150
81	*Poienita* Kindergarten	2102	2102
82	*Constantin Brancusi* School	1924	1924
83	*Constantin Brancusi* School	1789	1970
84	*Constantin Brancusi* School	1682	1682
85	*Mamaruta* Kindergarten	1049	1049
86	Special School Nr.1	1572	1572
87	Special School Nr.1	1805	1805
88	*Lumea Copiilor* Kindergarten	1602	1602
89	*Lumea Copiilor* Kindergarten	1861	1891

90	*Lucian Blaga* Theoretic Highschool	1984	1984
91	*Lucian Blaga* Theoretic Highschool	1513	1512
92	*Lucian Blaga* Theoretic Highschool	1294	1294
93	*Lucian Blaga* Theoretic Highschool	1718	1718
94	*N.Titulescu* School	1704	1704
95	*Al. Borza* Scholar Group	1866	1866
96	*N.Titulescu* School	1625	1625
97	Transylvania Transportation Technical College	1704	1704
98	*Raluca Ripan* Technical College	2238	2238
99	*Energetic* Technical College	1766	1766
100	University *Babes-Bolyai – F.S.E.G.A.*	1976	1976
101	University *Babes-Bolyai – F.S.E.G.A.*	1843	1843
102	*Ion Agarbiceanu* School	1845	1845
103	*Ion Agarbiceanu* School	1849	1849
104	*Ion Agarbiceanu* School	2015	2015
105	*Mamaruta* Kindergarten	2079	2079
106	*Anghel Saligny* Technical College	1885	1885
107	*Anghel Saligny* Technical College	1822	1822
108	*Anghel Saligny* Technical College	2026	2026
109	*Ion Agarbiceanu* School	2063	2063
110	*Mihai Eminescu* Theoretical Highschool	1956	1956
111	*S. Barnutiu* School	1761	1761
112	*S. Barnutiu* School	1930	1930
113	*S. Barnutiu* School	1917	1917
114	MR *Unirea* Scholar Group	2157	2157
115	*A. Iancu* Theoretical Highschool	1922	1922
116	*David Prodan* School	1818	1818
117	*David Prodan* School	1304	1304
118	*Horea* School	1677	1677
119	*N. Balcescu* Highschool	1671	1671
120	*Brassai Samuel* Highschool	1652	1652
121	*Expo Transilvania* Pavilion	1916	1916
122	*Expo Transilvania* Pavilion	1946	1946
123	*Expo Transilvania* Pavilion	1961	1961
124	*Expo Transilvania* Pavilion	1961	1961
125	*Expo Transilvania* Pavilion	1921	1921
126	*Expo Transilvania* Pavilion	1919	1919
127	*Degetica* Kindergarten	1889	1889
128	*Degetica* Kindergarten	1958	1958
129	*Al. Vaida Voievod* School	1764	1764
130	*Al. Vaida Voievod* School	1684	1684
131	*Al. Vaida Voievod* School	1449	1449
132	*Al. Vaida Voievod* School	2033	2013
133	*Samus* Arts and Crafts School	1751	1751
134	*Samus* Arts and Crafts School	2079	2079
135	*Samus* Arts and Crafts School	1569	1569
136	*Terapia* Industrial Chemistry Scholar Group	1859	1859
137	*Terapia* Industrial Chemistry Scholar Group	1772	1772
138	*Protectia Mediului* Scholar Group	995	995
139	*Horea* School	1530	1530

140	*Emanuel* Theoretical Highschool	1851	1851
141	*Emanuel* Theoretical Highschool	1376	1376
142	*Emil Isac* School	1664	1664
143	*Emil Isac* School	1253	1253
144	*Waldorf* Highschool	1477	1477
145	*Waldorf* Highschool	2046	2046
146	*Emil Isac* School	2021	2021
147	*Nicolae Iorga* School	1556	1556
148	*Nicolae Iorga* School	1963	1963
149	*Nicolae Iorga* School	2049	2049
150	*Tehnofrig* Scholar Group	1867	1867
151	*Tehnofrig* Scholar Group	1205	1205
152	*Aurel Vlaicu* Scholar Group	2087	2087
153	R.A.T.U.C. Garages	2037	2037
154	*Traian Darjan* School	2498	2498
155	*Traian Darjan* School	1653	1653
156	*Traian Darjan* School	1437	1437

Source : Biroul Electoral Central 2009

The highest density of polling stations is registered in the Manastur district, correlated linearly to the large number of inhabitants and the compact built structure of this residential unit. Average distances between the extremities of the polling stations are not exceeding 750 meters, which demonstrates the ease of access, within 30 minutes maximum isochronous from the place of residence to the polling station (Fig. 2).

The special polling stations and their voters

Table 2

Crt. no.	Adress	22.11.2009	06.12.2009	Difference	Percent %
157	Cluj-Napoca International Airport	1171	1246	75	6.40
158	Cluj-Napoca Railway Station	787	1702	915	116.26
159	Cluj-Napoca Railway Station	1017	1493	476	46.80
160	Observator Canteen Student Complex	959	2059	1100	114.70
161	Marasti Student Complex	925	1660	735	79.46
162	Hasdeu Canteen Student Complex	1109	1985	876	78.99
163	Hasdeu Canteen Student Complex	983	1702	719	73.14
164	Recuperatory Hospital	642	966	324	50.47
165	Emergency County Hospital	430	519	89	20.70
166	Cluj-Napoca Municipal Hospital	146	174	28	19.18
167	*Prof dr. Octavian Fodor* Emergency Hospital	319	444	125	39.18
168	Cluj-Napoca Infectious Deseases Hospital	174	184	10	5.75
169	*Prof. dr. Ion Chiricuta* Oncological Hospital	673	740	67	9.96
170	*Nicolae Stancioiu* Hearts Institute	673	930	257	38.19
171	*Dr. Constantin Papilian* Military Emergency Hospital	566	994	428	75.62
172	*Babes-Bolyai* University – *F.S.E.G.A.*	976	2118	1142	117.01
	Total	**11550**	**18916**	**7366**	**63.77**

Source : Biroul Electoral Central 2009.

To the 156 permanent polling stations 16 secondary polling stations were added; these included college campuses, clinics and central points of transportation hubs (railway station, air station, and airport) (table 2).

Fig 2. Polling stations in Cluj-Napoca.

5. THE ANALYSIS OF THE VOTING ACT

5. 1. The first electoral round

The election of the Romanian President in 2009 took place only in the second round of voting; in the first one the absolute majority needed was not met.

In the first round (November 22, 2009), 145,346 individuals decided to vote, i.e., 52% of the total number of voters. The highest turnout was recorded at polling station number 17 (Sports High School, Arinilor Street No.9), accounting for 86.04% of the voters allotted to it, while the lowest turnout was recorded at polling station number 150 (High School "Tehnofrig" Maramures Street No. 165 / A), accounting for 34.82%.

At the special polling stations 11,550 individuals cast their vote in the first round, which means 7.4% of all voters (156,896).

Several hypotheses may be issued on the differential percentage of turnout at the polling stations. Certain is that the reduced share of voters in the Iris district (Polling Station number 150) can be combined with the dominance of conventional urban space; added to it is the behavior of the compact group of Roma population that, along with many of the voters allotted to polling stations in the area, can be suspected of a certain feeling of indifference towards the electoral process.

Of the 12 candidates enrolled in the electoral race, on municipality level the candidate Traian Basescu received the largest sum of votes (64,084 votes, or 41%), followed by Crin Antonescu with 36,861 votes (23.5%), who was nevertheless third on national level. The third candidate according to votes in Cluj Napoca, with 24,044 votes (15.3%), was Mircea Geoana. Each of the other candidates gained less than 10% of votes.

From this point of view, Traian Basescu was voted by the majority in 152 polling stations out of the total of 172 (an overwhelming 88,3%). In the same manner of subordination, Crin Antonescu won a majority in 19 of the polling stations (11%), being on equal footing with Traian Basescu only at one single polling station (Polling Station No.91, *Lucian Blaga* High School).

5. 2. The second electoral round

The second round, which took place on December 6, 2009, saw 169,428 voters turn out at the polls, in excess of 12,532 compared to the first round (i.e., 7.9% more voters). Of the additional 12,532 votes in the second round, 7366 (58.7%) were cast in special polling stations. It should also be mentioned that the turnout at special polling stations, in relation to the first ballot, grew by 63.7% voters. The most significant increases were registered at the polling station number 172 of Gheorgheni district, located inside the Faculty of Economics and Business Administration, followed by polling station number 158 and 160, all three registering more than double the number of votes compared to the first round. It is worth mentioning that only 12 (7.7%) of permanent polling stations recorded increases in the numbers of voters in the second round of elections, compared to the first round. In all other stations the decrease was usually between -0.1% (Polling Station No. 2) and -7.7 (Polling Station No. 148) (fig. 3).

The decision in the second round was between Traian Basescu and Mircea Geoana. Overall, the candidate Traian Basescu received the majority of votes (63.5%), winning the election and a second term as president of Romania. When analysing the elections by polling stations, it is visible that Traian Basescu won the majority of votes in Cluj Napoca in 166 polling stations (96.5%). No polling station recorded equality between the candidates (Fig. 4).

6. RESULTS

The specific graphical and cartographic exercise was able to highlight in a very distinct manner the differences in voting preferences on the level of the municipality; this facilitates the overview of electoral behavior of an urban population with primary importance in the administrative hierarchy of Romania, a population characterised by a remarkable cultural and ethnic diversity. Moreover, the way in which the mapping software was designed and developed allows for a wide conceptual continuity on the same mapping block, which in time is capable of offering a view of the metamorphoses in electoral behavior in the municipality of Cluj Napoca.

In Table 3 we can see that in the special polling stations, in the first round the candidate Crin Antonescu secured majority in 13 from 16 polling stations.

The reason of this turnout are the students composing this stations that as we know, throughout the country this age group supported Crin Antonescu as president. The candidate Traian Basescu gathered the majority votes in just three stations and at a small difference to Crin Antonescu. In the second electoral round we can see that with the absence of the PNL reprezentative the votes were divided between the two last candidates Traian Basescu and Mircea Geoana.

The result is that the first one secured majority in all 16 polling stations with a greather difference between him and the second candidate. Mircea Geoana, the PSD reprezentative even if he was the second candidate in Romania, he scored majority in none of the special polling stations.

The number of votes for each candidate in special Polling Stations

Table 3

Polling station	First Electoral Round			Second Electoral Round	
	Crin Antonescu	Traian Basescu	Mmircea Geoana	Ttraian Basescu	Mircea Geoana
157	509	376	119	804	437
158	285	281	92	1117	569
159	386	340	130	941	532
160	433	251	103	1295	715
161	318	338	97	1123	519
162	517	288	90	1217	720
163	434	230	99	1032	630
164	216	229	79	605	346
165	147	140	41	360	152
166	64	46	7	103	71
167	103	101	39	255	182
168	67	72	13	107	72
169	258	205	89	418	310
170	266	170	74	537	377
171	209	177	68	589	396
172	399	270	137	1357	741

Alltogether we have seen that in Cluj-Napoca the PDL party and the candidate Traian Basescu have a great influence, thanks to the former mayor of the city Emil Boc (now prime minister), and current mayor Sorin Apostu that like Emil Boc is also head of the PDL party in Cluj-Napoca.

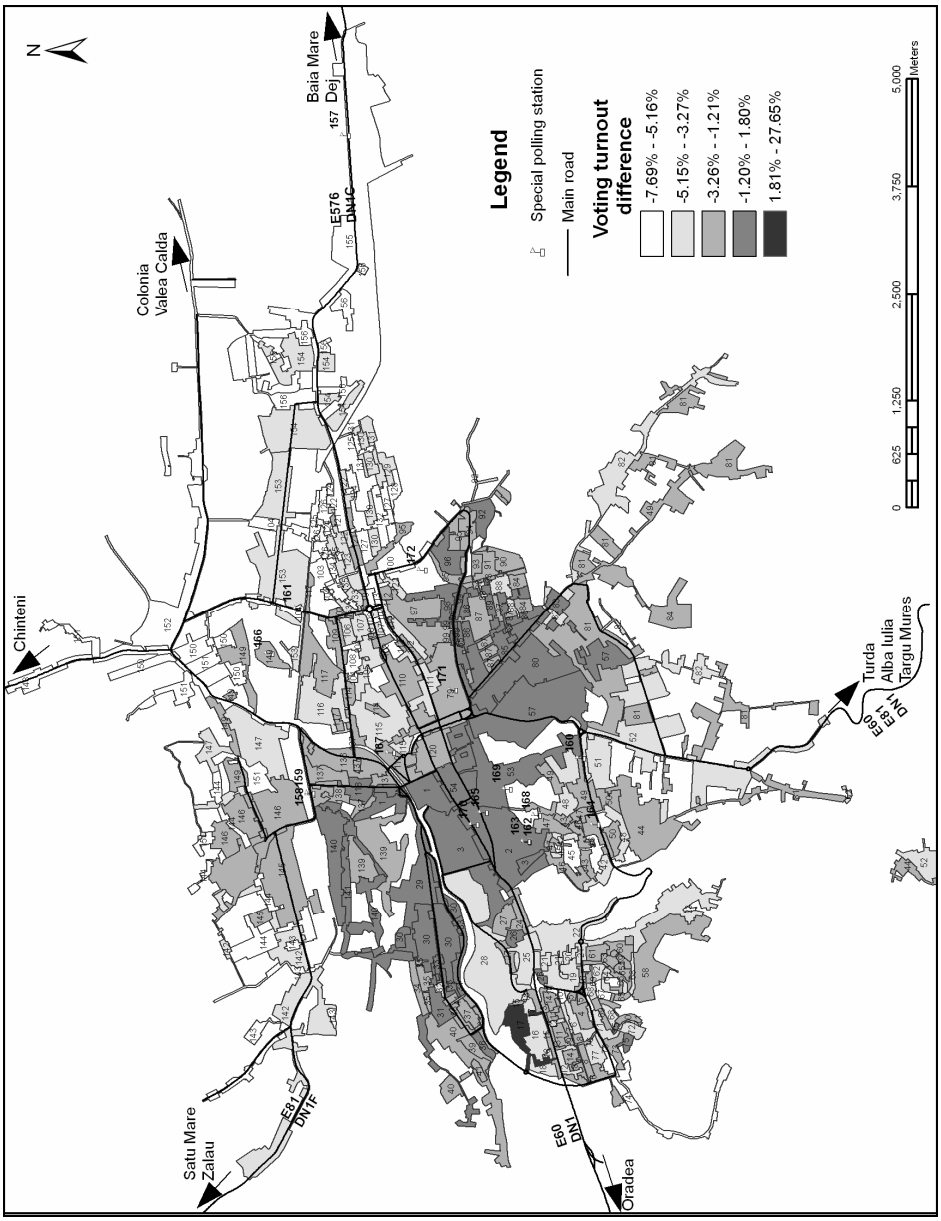


Fig. 3. The share of voter turnout by polling stations.

On the choice for one candidate or the other, we are not able to deliver any valid general or particular conclusions, this being a subject for specialised sociological surveys.

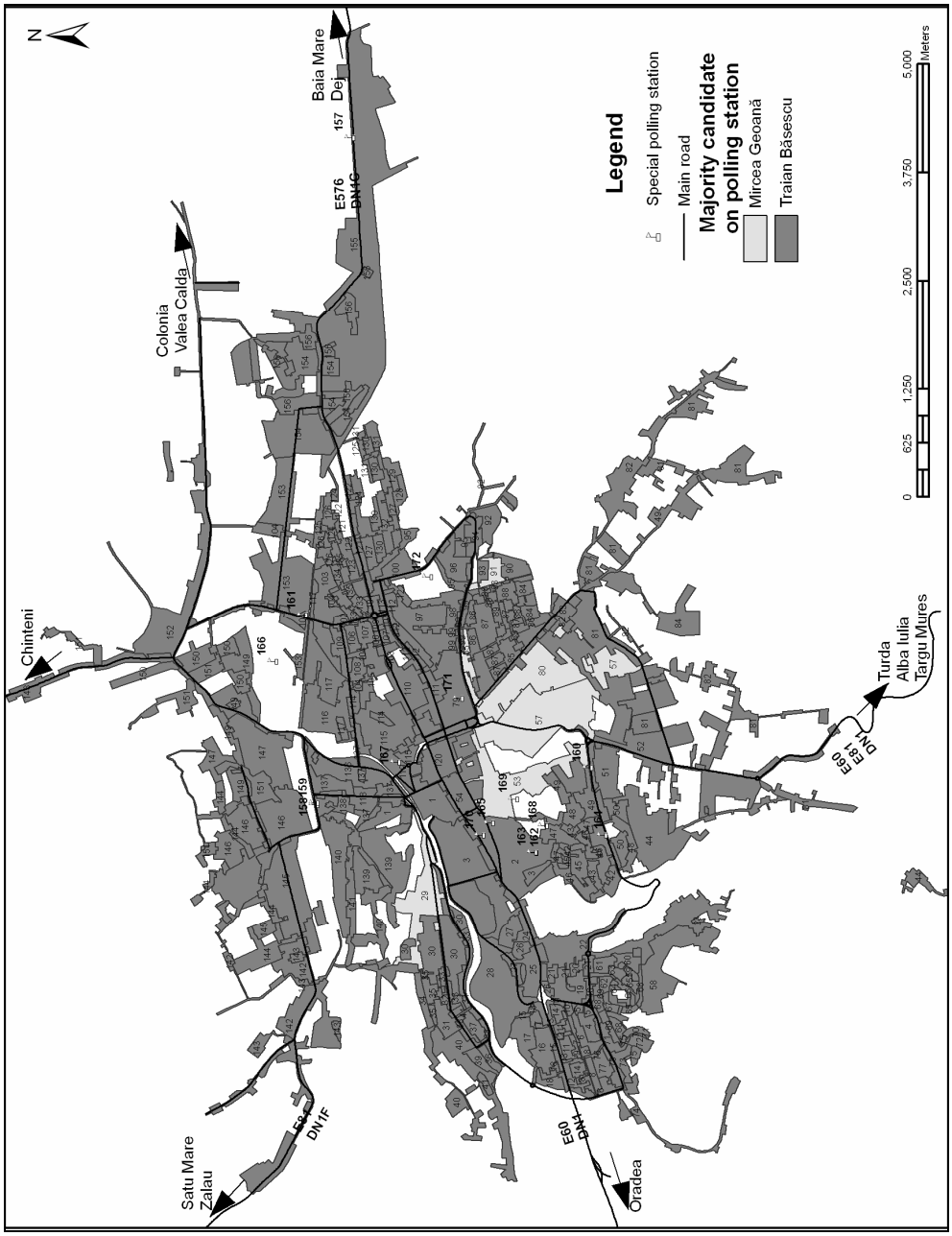


Fig. 4. The majority candidate by polling stations after second round.

7. CONCLUSIONS

The cartographic method presented in this study represents a more than useful tool for policy makers and local administration, as well as for those interested in fast and correct information in the field. The predominance and the success of Traian Basescu in a city with tertiary activities and population can be attributed mostly to the strong reminiscence in collective workers' mentality, as a reflection of temporal inertia in social systems as a whole.

R E F E R E N C E S

1. Bodocan, V. (2001), *Etnie*, *confesiune şi comportament electoral în Transilvania*, Editura Presa Universitară Clujeană, Cluj-Napoca.
2. Surd, V. (2006), *Geography of Settlements,* Presa Universitară Clujeană, Cluj-Napoca.
3. Autoritatea Electorală Permanentă » Activităţi AEP » Secţii de votare » Referendum Naţional 2009 » Cluj – delimitarea şi numerotarea secţiilor de votare din judeţul Cluj pentru desfăşurarea referendumului naţional. [http://www.roaep.ro/ro/getdocument.php?id=3474]
4. Biroul Electoral Central » Rezultate » Rezultate finale turul I şi turul II » Secţii de votare. [http://www.bec2009p.ro/rezultateP.html]
5. Mattheus, A.S. (2002), *Political Science in GIS*, available on-line @ [www.pop.psu.edu/gia-core/pdfs/gis_rd_02-31.pdf]

STUDIA UBB GEOGRAPHIA, LVI, 2, 2011

THE RURAL GERMAN EDUCATION IN SIBIU COUNTY

ADRIANA MISACHEVICI[1]

ABSTRACT –The Rural German Education in Sibiu County between 1988 and 2010. Even if the number of the rural German students of Sibiu county cannot be compared with the number of urban students, we can notice some rural places, where the German education is still developing, even if most people of German origin have emigrated to Germany. The herein survey reveals the nowadays status of the German education in the rural areas of Sibiu County. On the basis of data supplied, it is remarked that in the rural areas analyzed on the territory of Sibiu County, unfortunately, there is only one school where there are grades from the 5th to the 8th, namely the secondary school in Apoldu de Sus. This school has a large number of students, because it also has a boarding house. The other villages have both a kindergarten and a school with grades from the 1st to the 4th. Unfortunately, a significant number of students do not longer study in German as there is no possibility to study in this language from the 5th grade. The village does not benefit from a secondary school in German.

Keywords**:** *international language, emigration.*

1. INTRODUCTION

At the beginning of the Romanian education, the Church, priests and the rural schoolteachers played a very important role.

Thus, in the first half of the XVI century, in Sibiu, the Slavonic writings were translated into Romanian, which is a fact proved by the existence of a translation movement in the surrounding Romanian villages.

In the following century, there was the emergence of the school teachers used to educate young people and paid by the peasants in the rural area.

Most of these young people would attend the Catholic schools in Sibiu, having the opportunity to study in Vienna and Rome, in order to become jurists, doctors, teachers, physicians, etc.

Benefiting from the support of the officials and communities, the Transylvanian Saxons coming from Sibiu and its surroundings would have a more organized education than the Romanian ones.

In 1526, there was a Medieval High-Level School called "Studium Generale Cibiniensis" headed by the Dominican monks. This school was also attended by the first Romanian poet of Latin language: Nicolae Olahus (1493-1568).

However, the traditional Catholicism and the dogmatism in theology would finish as soon as Ioan Honterus' reform was officially accepted and applied in 1543, when the Dominican Monastery in Sibiu was abolished.

[1] *Colegiul Tehnic"Independența", 550341 Sibiu, Romania, e-mail: amisachevici@yahoo.com*

Since then, all the Transylvanian Saxons schools have been under the protection of the new Evangelical - Lutheran Church and organized on the German model.

In 1555, the school in Sibiu, which had been working since the second half of the XIVth century, became the most important school of the Saxons and changed into "Gymnasium". Here, only highly - trained teachers from Switzerland and Germany were teaching.

In this Gymnasium, the teaching was based on the Latin language, which was also used in administration and justice, together with the Ancient Culture knowledge, while in the confessional rural schools the basic teaching involved reading, writing and calculating.

The Presbytery led by the priest solved everything in connection with school, education.

At the beginning of the XVIth century, in some of the Saxon villages there were public schools with schoolteachers paid by the community. In 1704, when all the Saxon schools received the organizing on grades, the teachers started being paid by the local administration.

Starting with 1722, the Saxon primary education, generalized in all the villages with German population, was declared compulsory. The leaders, at that time, were focused on the students' living conditions and the progress of the German education.

Thus, a part of the school books were printed in Sibiu, others were brought from Germany. The graders from the secondary school, having a Competence Certificate issued by the Rector and the schoolteachers, were allowed to leave the country in order to study abroad, with the approval of the Magistrate.

The good students also benefited by a special training, and the most diligent ones received a kind of scholarships for university studies abroad at: Iena, Halle, Lipsca and Erlagen, together with the loans - paying back the guarantee and the debts to the Magistrate. Other young people got jobs in both the urban and Chair administration.

Starting with the XVIIIth century, Sibiu became the most important centre of the Transylvanian Saxon education, a position fulfilled by the German rural education.

2. THE RURAL EDUCATION IN THE GERMAN LANGUAGE IN SIBIU COUNTY BETWEEN 1988 – 2010

The analysis of the rural education in the German language in Sibiu county has as a starting point the statistical data from the school year 1988-1989.

The school years was chosen in order to have a comparative situation as relevant as possible with the school year 1990-1991, when a great part of the ethnic Germans emigrated to Germany.

In the school year 1988-1989, in Sibiu county territory there were 69 rural settlements, which had German teaching sections as mother tongue.

Among these, 50 rural places had only from the 1st up to the 4th teaching grades, where a simultaneous education was being practiced, whereas in 19 rural places, there were from the 1st to the 8th grades. Within the 1st and the 4th grades, there were 1,885 students and within the 5th and the 8th grades only 1,052.

In figure 1, the villages where German was taught during the school year of 1988-1989 are shown.

In 1989-1990 school year, there were no great changes, the number of rural places with German teaching from the 1st to the 8th grades decreased from 19 to 16 and the number of places with the grades from the 1st up to the 4th increased to 53.

The school year 1990-1991 brought a real change in the rural educational system of German teaching in Sibiu county.

Because of the massive emigration of the Transylvanian Saxons and German teachers as well, the number of places where the German language was taught as a native one, seriously decreased.

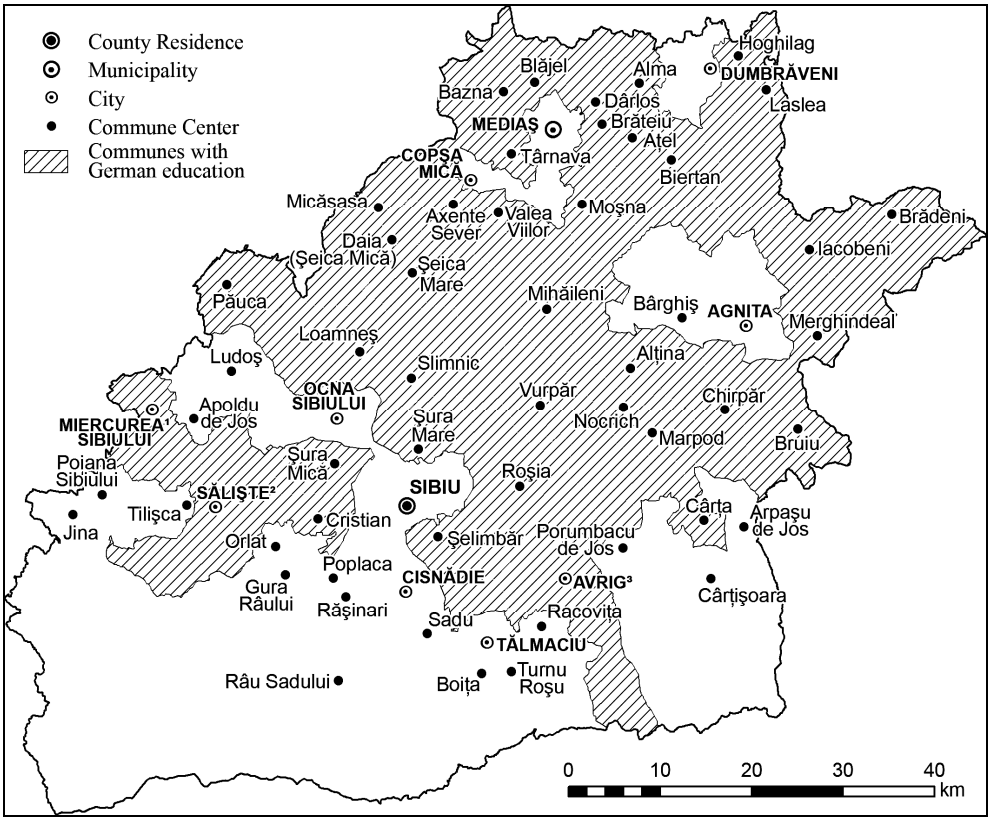


Fig. 1. The villages with native German education in the school year 1988- 1989.

In figure 2, the villages where the German was taught as native one during the school year of 1990-1991 are shown.

Thus, in the school year of 1990-1991, the number of places with native German teaching education was 36, among which 34 had grades from the 1st to the 4th and only two schools had between the 1st and the 8th grades. So, the number of students in the grades between the 1st and the 4th decreased to 504 and those in between the 5th and the 8th to 74 students.

Because of the decrease of the number of students and the lack of highly trained teachers who could teach the German language, in the school year of 1995-1996, there were only 10 rural places where the German language was taught as mother tongue. Out of these, nine villages had only grades between the 1st and the 4th with 143 students and the only

school in the rural area with grades between the 1st and the 8th was the one in Apoldu de Sus village, where only 32 students were learning.

According to the research, up to the present day, we have noticed that, although the number of the German nationals has decreased, more and more parents are sending their children to the German teaching section, even if they are Romanians.

In the school year 2009-2010, in Sibiu County the primary education in the German language was practiced in 6 settlements such as: Alțâna, Vurpăr, Malancrav, Nou, Şelimbăr and Apoldu de Sus, with a total number of 125 students. The secondary education was present only in the school in Apoldu de Sus, having 52 students.

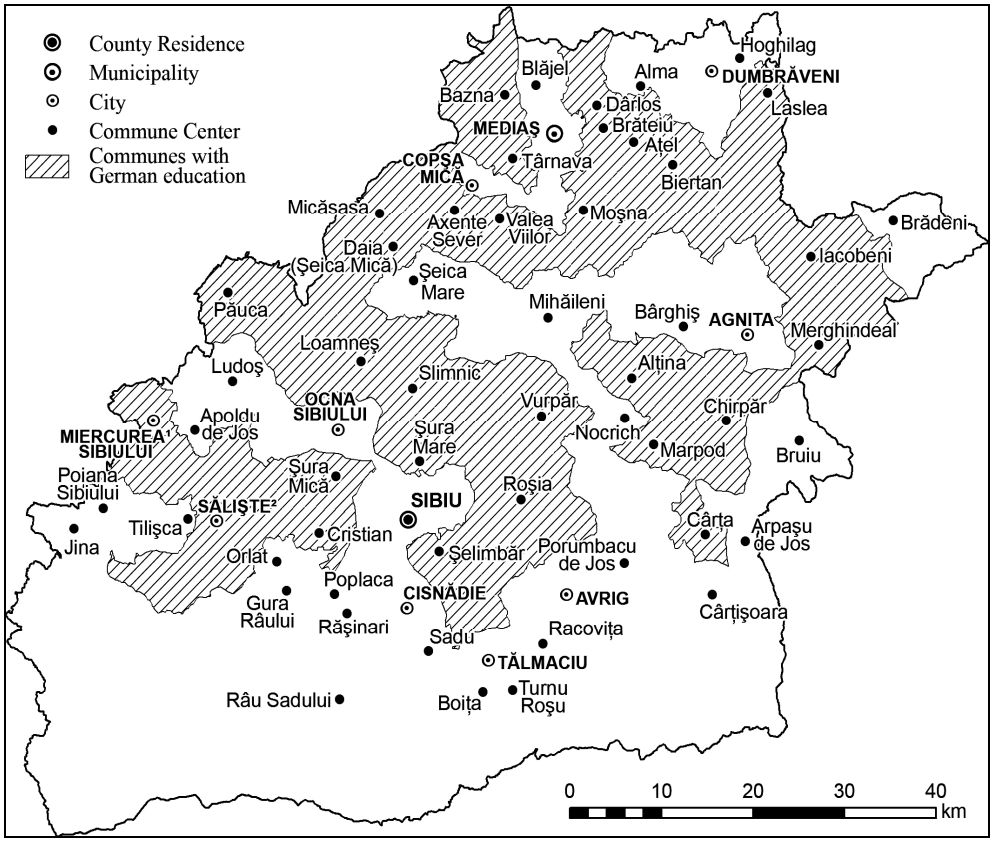


Fig. 2. The villages with native German teaching education in the school year 1990-1991.

Fortunately, there is the school in Apoldu de Sus, which is the only rural school in Sibiu County having grades from the 5th to the 8th, while the number of students remains the same. This is due to the fact that the school also owns a boarding house, where the students from the surroundings can benefit from board and lodging. At this school, there are also teachers who come from Germany and Austria.

Researching the statistics about the evolution of the German rural education between 1988-2010, one can notice both a striking decrease of both the number of students within this period and the number of villages where native German language was taught.

Thus, in the school year 1988-1989 the number of students who learned in German language was 2,937, out of whom 1,885 in the primary school and 1,052 in the secondary school. In the school year 1990-1991, the number decreased to 578 students, meaning by 80.3 % less than in 1988-1989 (504 students were attending the primary school) and by 92.9 % less in point of the secondary school in the same period (74 students were attending the secondary school).

For the last researched period 2009-2010, we distinguish the following situation compared with the period 1988-1989: the number of students has decreased to 177, meaning 93,9% less than in 1988-1989, having 125 students in the primary school, that is a decrease of 93.9% , whereas, in the secondary school, there were only 52 students, meaning a decrease of 95% compared with the period 1988-1989.

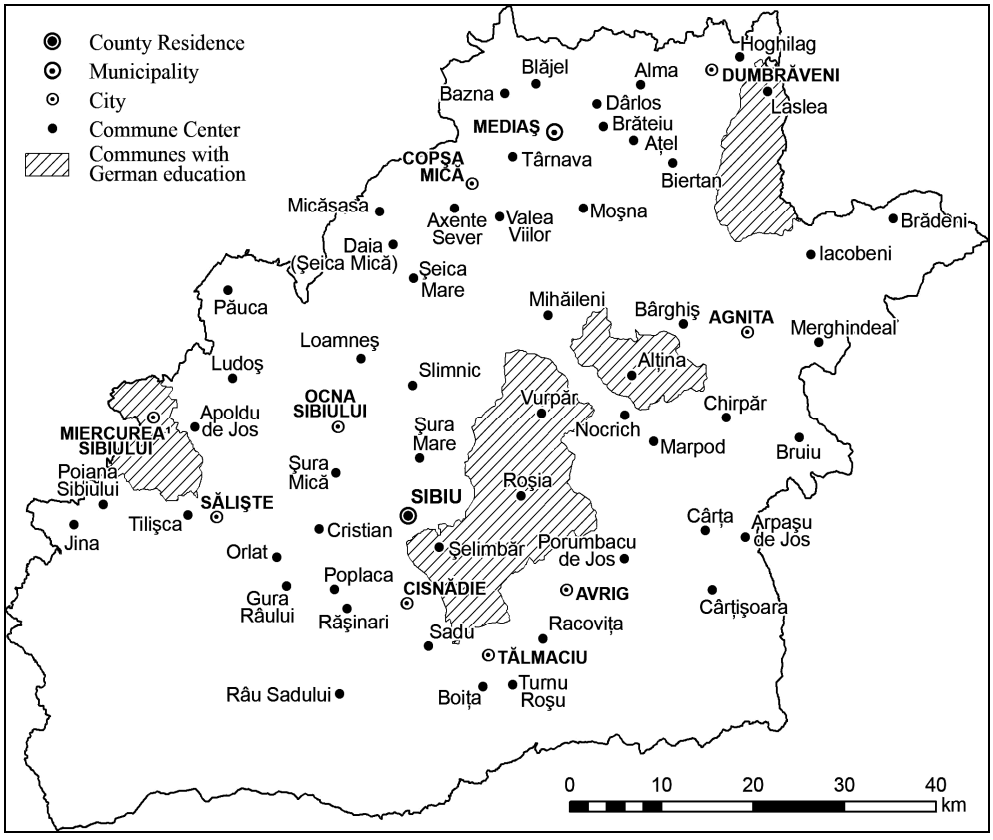


Fig. 3. The villages with native German teaching education in the school year 2009-2010.

Concerning the situation of the native German education at the village level in 1988-2010, we notice the existence of 69 places in 1988-1989, out of which, 50 had primary education and 19 had both primary and secondary education.

The number of settlements decreased to 36 in 1990-1991, meaning 47.8% less than in 1988-1989; 34 places had primary schools, 32% less than in 1988-1989 and in only two, there were both primary and secondary schools, meaning 89.4% less than in 1988-1989.

In the school year 2009-2010, there were 6 settlements where the native German language was taught, meaning a decrease of 91.3% compared with 1988-1989. Five places had primary education, 90% less; only in one place, there were both primary and secondary schools - Apoldu de Sus, meaning a decrease of 94.7% compared with 1988-1989.

3. CONCLUSIONS

One of the reasons that many parents of Romanian nationality send their children to the German teaching section is that acknowledging an international language, the graduates of a German teaching school have more opportunities to find a job.

Moreover, another reason which has contributed to maintain an increasing interest in the German education is that some of the faculties in the "Babeş-Bolyai" University prepare teachers specialized in the German language teaching.

To conclude, we can mention that the rural German education is relatively stable, even with increasing chances if it is invested in the human resource in the future.

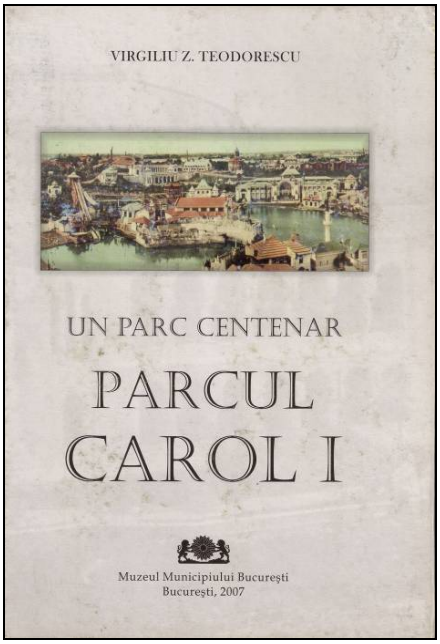
R E F E R E N C E S

1. Dumitrescu-Jippa, A., Nistor, N. (1976), Sibiul şi ţinutul în lumina istoriei-vol.I, Edit. Dacia, Cluj-Napoca.
2. Philippi, F., Statistica şcolara întocmită pentru Comisia şcolara a Forumului Democrat al Germanilor din Transilvania.
3. Statistici şcolare I.S.J. Sibiu.
4. ro.wikipedia.org.

RECENZII

TEODORESCU, Z. VIRGILIU (2007), Un parc centenar – Parcul Carol [*A centenary park - The Carol I Park*], Edit. Muzeului municipiului Bucureşti, 696 p. (AL. PĂCURAR)

The Bucharest City Museum's publishing house brought out the voluminous book dedicated to the Carol I Park, written by professor Virgiliu



Z. Teodorescu. The book is structured in three parts: the first part (pages 9 to 94) comprises the actual study of the Carol I Park; the second part (pages 95 to 671) represents an extensive volume of annotations, which can rarely be seen in a book, showing the author's seriousness, accuracy and exegesis; the third part is graphic (pages 673 to 696), containing suggestive images of the EGR from 1906, especially the main exhibition pavilions.

The author, "being a historian and part of the centenary of the union (1959)", was born in Bucharest, as he feels the urge to confess it himself, "being a practitioner in the fields of biblioteconomy, ethnology, archaeology and museography", with an activity of more than four decades, most of it performed at the National Archives in Bucharest, where he was in charge of the Archives Museum's activity.

In the publishing field, as a historian and a person involved in the affairs of the society, he introduces himself with numerous studies, articles and books, true exegeses of their field, the author possessing three qualities: being an archivist, a museographist and a historian of monuments. These qualities give the full measure of his studies. Also, above all these, there is his love towards his native town, Bucharest, which "was meant to be the shrine of the entire union", as beautifully put by the poet Adrian Maniu (1934, Book of the Nation).

Virgiliu Z. Teodorescu is an exegete of Bucharest, the city that unexpectedly replaces Constantinople, after its disappearance in 1453, by being surprisingly attested in 1459 for the purpose of following the byzantine traditions of the city near Bosphorus, as Nicolae Iorga stated in "Byzance après Byzance".

After the Union of the Romanian Principalities in 1859 and the attainment of independence in 1877-1878, Bucharest has undergone major changes becoming a capital city – even though it became the capital city of a yet small country – and a European city.

It should not be forgotten that at the end of the 19th century and the beginning of the 20th century, many important edifices were built in "Bucur's city", such as: the old edifice of the National Bank (1883-1885), the Athenaeum (1886-1888), the Palace of Justice (1890-1895), the Chamber of Deputies (1890-1907), the Post Office Palace (1894-1900), the CEC Palace (1896-1900), the Carol I University Foundation (1891-1914). Among the numerous achievements in the town-planning and architectural field, the urbanized-landscape ensemble, which is the General Romanian Exhibition Park from 1906 (EGR - 1906) stands out, which was later called the Carol I Park.

Thought out as a "business card" of Romania, making known her achievements and her creative and productive potential after forty years of prolific kingship of Ruler and King Carol I, this general exhibition has mobilized the Romanian society of that period for its materialization, being an example for the future generations.

Virgiliu Z. Teodorescu, by means of an alert succession of intriguing subchapters and by a wide variety of information, ushers us into the background of a gradual development of this perennial jewel of the capital city, starting from the land selection, the avatars of the exhibition realization, the backstage intrigues, up until the moment of inauguration in a sincere outburst of national pride and fraternization of the Romanians from all the areas of the country, from the Balkans to the Dniester, from Maramureş to Banat.

The chosen place for the EGR-1906, a piece of land "from the foot hill area located between Filaret and Şerban Vodă", where "the swamps, the reeds, the ponds defined the landscape, being a shelter for the waders, for those who had fought the law…" (pages 20 to 21), known as the land located nearby the Filaret Field, was transformed into a park.

The idea of creating an exhibition park belonged to Take Ionescu and after the approval of the project, the Academician and Doctor Constantin I. Istrati was nominated as the general commissioner of the EGR-1906. "The most powerful" ministry of that period – the Ministry of Agriculture and State Domains, led by Ion N. Lahovari, was in charge of guaranteeing concerning all aspects (organizational, financial and in the field of human resources) the materialization of the park. In this effort, the Mayor of the capital city, Mihail G. Cantacuzino, joined the above mentioned personalities. These great statesmen gathered a defined team of architects, constructors and entrepreneurs, among which the author cites Ştefan Burcuş, Victor Ştefănescu and E. Redont, who imagined and created in a short period of time the EGR-1906 Park, also designed for a perennial landscape function.

Virgiliu Z. Teodorescu presents the transformation stages of the land located at the east of the Filaret Field, adjacent to it, "from a swamp to the priceless green lung" of Bucharest, with the entire series of exhibition edifices of art and public forum, each of them having its own symbolism and function in a country, that was in development and in the process of unification. Such edifices are: the Romanian Arenas – a magnet for Romanian manifestations, with references to our origins, the Pavilion of the Arts – mirror of the creative Romanian genius, the European Commission of the Danube Pavilion – with the accomplishments of a management model of the river and its delta, the Tomb of the Unknown Soldier – the symbol of the ultimate sacrifice for the attainment of our national ideals, different pavilions of the state – Agriculture, Industry, Public Works, Post Office, Fisheries of the state, even a pavilion of manufacturing and fashion (such modern development directions for that time!), each with its accomplishments and future plans, the Civil Hospitals' Institution, the Royal Pavilion with the accomplishments and mission of the royal house, pavilions of the historical-geographic Romanian provinces, etc., etc. Within the "outside furniture", the sculptural ensemble "the Legend of the Pines" stood out, piece of art that was created by the sculptors Dimitrie Paciurea, Frederik Storck and Filip Marin, following a theme belonging to writer Carmen Sylva, as the gift of the city of Rome – the Capitoline Wolf, which was later located in the Saint George Plaza, marking the "zero point" of the country, the place from which all distances to the borders were being calculated.

The author provides interesting information concerning the impact that this kind of manifestation had on the "inside life" of the capital city, the transport infrastructures, the accommodation, the restoration, the medical services, the order, also on the "echo of the brothers' call", which refers to the Romanians that lived abroad, on the "souvenirs for the future", an aspect that is not at all left out, showing the visionary qualities of the organizers, if we think about the present times, when there is a lot of emphasis put on the "brand", the image of a product, a region, a country, a city etc., in the conscience of the consumer.

Many subchapters describe the inauguration of the exhibition with all the deriving corollary – speeches, artistic manifestations (choirs, exhibitions, races) and others, which the author depicts, with his characteristic accuracy. We will stop for a moment and review the important passages, selected by the author himself. Thus, the Minister of State Domains, Ion N. Lahovari was saying: "we carved hills, dried out ponds, clogged a valley, dug a hole for a big lake and in less than a year, we created the park and the exhibition building", while the general

commissioner, Dr. Constantin I. Istrati "considered his entire effort as an expression of the high responsibility, which we have towards our people", an accomplishment destined "to portray a period of deep transformations in the configuration of Romania"; Emil Pangrati emphasized that "here, in ten months, the first Romanian exhibition was positioned and built, on the Filaret Field, a deserted field, where there was nothing before, no roads, no canals, no water…there were only swamps", and King Carol I, great king and national founder, conveyed: "with deep and inmost joy, I salute our first national exhibition, a true celebration of the Romanian labour". In this context, it must be mentioned that the realization of the EGR-1906 was a true example, which was followed by exhibitions of the historical-geographic provinces, such as the one of Moldavia in 1923, of Banat in 1925 or the ones of the national economy's branches, such as the Exhibition of air-auto-radio-electricity (1931), Our Romanian Labour (1937) or even international geo-political ones, such as the Little Treaty of the Bucharest World from 1936, all being big successes of their time, not to mention the international ones in which Romania participated, whose pavilions enjoyed a lot of success: Barcelona (1929), Bruxelles (1935), Paris (1937), Milano (1937) or New York (1939), this last one being a real triumph of the creative Romanian genius, unequaled until now. Rightfully, "Bucharest had become for the first time an international capital city", in 1906.

In a few sequences, such as "*The epigones and their destructive interventions*", "*Symbols destined for eternity, ruined today*" or "*Other exhibition operations*", the author describes the absurd, abusive interventions of the communist authorities against the Carol I Park, that left it destroyed, bringing serious harm to the memory of the predecessors, to those, who with such toil and ordeal, had created and given an honourable face to Romania. Such examples are: the mausoleum "of the Heroes (?} of the working class" (probably heroes, because they sold their country!), the devastation and the delocalization of the sculptures from the "Legend of the Pines" ensemble, of the Royal Pavilion – "magnificent building, that was instantly surrounded by a big fire from all its three sides" in the 1950s (something similar "happened" to the wooden little church from the Hațieganu Park in Cluj-Napoca, which started burning "instantly" around Easter Holidays in 1982!), of Ion N. Lahovari's bust and other objectives belonging to the national heritage, that were important for our national identity. Throughout these passages, the bitterness of the author is piercing through the lines.

His documented study is concluded with some advice concerning some "minor repairs" that the Carol I Park needs, because, says the author: "it is our turn and it is expected of us, as a generation which has the obligation of handing over this legacy to the next generation, to take reparatory action and get back the park anywhere near the state it was in 1906", specifying the actions that should be taken, idea that I convincingly support. In this respect, I think about the rebuilding of the five statues of Mestrović, which represented the Romanian provinces that were united to the mother country in 1918 and their relocation in their old sites. I also think about the rebuilding of the Văcărești Monastery in an honourable location, the reestablishment of the statue of Carol I in the Palace Plaza, after it will have been rebuilt following the original design of the Croatian sculptor, not to mention the numerous buildings belonging to the national heritage, that are treated with great indifference by the authorities. Nevertheless, we should notice the responsible attitude and civic spirit – even though they are rarely seen – of some associations, foundations and visionary young people, who militate in favour of a civilized Bucharest, Romanian and European at the same time, and in favour of its perennial values.

The study on the Carol I Park written by professor Virgiliu Z. Teodorescu is accompanied by an immense volume of "Annotations", in which his qualities as an archivist and tireless researcher stand out, being a model of bibliographic approach, a very rare phenomenon in the Romanian publishing field.

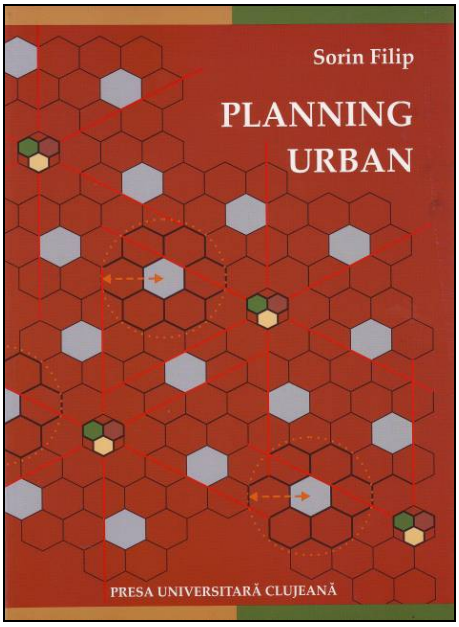
In our opinion, without diminishing its scientific and documentary value, contrariwise, we believe that an album format would have been more appropriate for the book, as well as a larger number of images incorporated in the text, other graphic replicas of posters, boards, advertisement notes, related to the EGR-1906, and an overall map.

All in all, we have discovered a publication of great documentary value, a model of exegesis and of interdisciplinary approach at the same time, which is addressed to historians, geographers, urbanists, sociologists at the same time and to those who love our capital city, which is rich in accomplishments, young people and old people alike; this book should exist in any public or big private libraries.

Lecturer Păcurar Alexandru, PhD

FILIP, SORIN (2009), Planning Urban [*Urban Planning*], Presa Universitară Clujeană, 332 p. (AL. PĂCURAR)

In the year of 2009, at the Cluj Accademical Press, the book entitled *"Urban Planning"*, belonging to Mr. Sorin Filip, has seen the light of the printing press. It was a much expected work, especially by the students of the Territorial Planning Department and even by the general public. This book fills up an empty space, because works with an integrator – interdisciplinary character, as the one we are holding in front of us, are rather rare in the Cluj publishing environment and even on national scale.



In this order of ideas, we need to mention the special contribution brought to the organizing of the territorial planning, both theoretically and practically, through the studies that were done and the plans of equipping of the different territorial entities, by the members of the Faculty of Geography from Cluj.

The work we are presenting is a successful theoretical approach of urban planning; it is structured in eight chapters whose thematic covers the issues raised by this subject – let us not forget that it has a strong formative character, it also includes a generous summary in English language and a bibliographic list with the works consulted and suggested for elaborate study, with a predilection toward Anglo-Saxon literature. The text is completed with a series of suggestive images, sketches and logical schemes, images of "urban gestures" which, when well chosen, become a component of the urban esthetics, even caricatures that incriminate dysfunctions. Suggestive, very synthetic and filled with wisdom are the quotes and / or the enunciations which the author formulated immediately after the titles of the chapters, besides the fact that they are exciting, they draw you into a lecture to which you become a part of, puts interdisciplinary character of the phenomenon to the test and it confirms both the culture and education of the author and his power of introspection.

In chapter 1, *"Evolutional Benchmarks in Urban Planning"*, the author summarizes and explains the trinomial terminology urban – urbanism (city planning) – planning, the semantic meaning in major international languages, like "the position" of urban planning in relation to the "interests" of the main actors involved in the destiny of the *"citadel"*: private interests, the interests of the community and the interests of the authorities. Their harmonization into a long-standing operation materialized into functional urban structures and on human scale, into friendly urban environment.

The author marks the stages of urban planning development, in concordance with the development of society, each with its particular characteristics: pseudo- urban planning until the year of 1850, incipient (1850-1899), when the masses develop the spirit of citizenship, of the urban experiments (1950-1993) – here he reminds us of three great tendencies: the

garden type city ("Garden City"), the monumental city ("Beautiful City") and the functional-rational city "La ville Radieuse", within the context of the endorsement by the international community of the Athens Charter (1931), that set the "frames" of the modern living, free from any doctrinarian aspect, the stage of the conceptual maturation, consolidated by the Venetian Charter (1964) and, finally, the contemporary stage which is in progress since the mid-1990s, when the "repositioning of the individual and of the community, as beneficiaries of the actions of urban planning, of the reconsideration of the inherited urban values" occurred.

In chapter 2, *"The Urban System"*, "… elements… interaction… condition", after a plea for the approach regarding the integration of the urban planning, due to its pluri-, inter- and trans-disciplinary character, the author reviews the structural elements of the *"urban system"*: the natural ones, with the elements that influence the spatial organization, the social elements, of the human communities, economical elements, which assure the function of a city and of the elements that are *built*, I would say – quoting the late Professor Curinschi Vorona – *"the suggestive expression"*.

Chapter 3, *"Urban Planning. For whom?"* is a pleading for a human purpose, for "the man of the fortress", of planning, because *"the people are the city"* and it gives the author the opportunity to do an inventory of the "needs" of the residents living in the urban environment, with interesting examples and with the presentation from the end of the chapter, the Maslow's pyramid, with the hierarchy of the human needs and the influence upon the urban planning, announcing, in a way, the chapter entitled *"Urban planning. How? When?"*. In this chapter, which is a broader one, one of the "hard cores" of this work, alongside chapters 6 and 8, the author undertakes "the defining of the" urban "spatial entities" and the division into zones of the urban space, respectively the residential, central, industrial areas, of the connected activities and of the open urban spaces – parks, market places – public markets, the element that is called "agora", which comes from ancient Greece, pedestrian streets, squares, that are of great importance for civic life.

Within each functional area, the author presents us the international experience and has both positive and negative examples from which we can draw constructive conclusions. I catch a glimpse of some connotations of the force existent within the examples which were presented, much needed in the training and education of the young people living in a troubled Romanian social context, in which the promotion of non-value has negative influences upon the urban space, and which through its aggressiveness, affects us all.

The author stops for a moment upon "urban renovation", a phenomenon that began to preoccupy the urban planners in the 1960s, in their effort to convey the splendor and the personality of the cities. In Europe, a continent with ancient urban traditions, this process knows a great effervescence, to only briefly remind the renovation of the historical centers of cities like Nice, Dublin, and Lille, like Sibiu or Brasov in our country, where, under the quite thick blanket of neglect, we discovered a valuable urban architectural heritage. The author could have developed this aspect even more, which on its turn has the potential to become an urban "element of attraction", besides the other ones he mentions.

Synthetic and punctual, are the words that best describe the subchapters entitled *"Public participation in the process of urban planning"* and *"The ethics of urban planning",* much needed and necessary in our country in order to form the conscience of the citizen which is a conscience that participates. This occurs especially in the first urban generation and regarding an "ethics" in the development of the cities in a period when, in our country, and nonsense, the urban community takes part in the process of urban planning, but…others take advantage of this!

The chapter ends with the presentation of some concepts and schematic approaches in *"Strategic planning"*; the rational model, the incremental model (rather gradually!) and the mixed model are all presented to us, respectively the operational phases of the planning and the relations between the objectives which are divided into sectors.

The city as a system is a product of the interaction with the territorial system, with who the city is in a relationship of symbiosis, is a "center of command", of organizing and integrating the surrounding space, smaller or larger, according to its importance. The way of interaction of the

urban- neighboring space, the urban influences within the territory and their materialization through metropolitan and suburban areas, each with its own particularities, represent the topic of chapter 5, *"The City within the Regional System"*.

In *"Urban Patterns",* chapter 6, the author captures the essence of urban planning, because the city must be *"better, not bigger!"*, as he says it, the urban system with "its functional valences and with the symbolic meanings", being a gearing of a social importance. It is also important as far as the identity is concerned, if I may say. The constituent elements of the urban gearing, respectively the *street pattern* (with the typology criteria, characteristics and particularities of the configuration), the *urban pattern* (highlighted by a series of criteria such as the degree of concentration of the constructions, of the internal structure and of the special configuration) and the *evolutionary pattern* are explained successively by the author, both literally and by suggestive images and flowcharts.

In the approach of *"The Methods of Research in Urban Planning"* (chapter 7), the author starts with a seemingly trivial fact, "the contact with the city can be done directly through the "physical immersion" of the observer into the urban organism, and also indirectly, based on descriptions or on visual representations" (page 183). Research in urban planning is a difficult undertaking. The methodology of approach is solid, for we are dealing with an area of interference of certain various disciplines – demography, physical geography, economy, sociology, ecology, architecture, etc.

Addressing some methods of research, the author sets off from the general – *"principles of knowledge"* and *"general methods of knowledge",* approaching then *"the techniques of investigation of the urban system"* with the particularization of the *"urban cartography"* and its product – the map; it should be noted that the author is also a good practitioner, digital cartography operations are not foreign to him.

The largest printing space is occupied by Chapter 8, *"Concepts and Modern Principles in Urban Planning",* explained by the increasing importance that is given to the house and to inhabitation, the current philosophy in dealing with the urban space focuses on these two elements *"as a possession, as a resource"* (page 228).

In approaching the conceptual setting of "New Urbanism", the author starts from the macro-scalar level –the region, the metropolis, the city, then he gets to the mezzo-scalar level – the neighborhood, the district, the passage and he ends with the micro-scalar level – the quarter, the street, the building, defining each level and highlighting its particular characteristic.

Due to the fact that, presently, a strong tendency of returning to nature is being manifested, a tendency of "harmonization of the atrophic activities with the natural fluxes, after decades of education regarding ecology and environment, a reassessment of the urban way of living is taking place, and, as a consequence, assuming this entire tendency, the author ends the chapter by approaching "green urbanism" – Green Urbanism, the city found in symbiosis with the natural environment and its materialization – "the urban village" – Urban Village and the Ecopolis.

In conclusion, we hold in front of us a compact work under the aspect of scientific information, of the used concepts and terms, always connected to the international situation, with a specialized language and a specific vocabulary, where, due to the "ingredients" taken from the field of arts – painting, literature, sketches, quotes and introduced within the text with a strong synthetic – punctual impact, make reading fun, easy. To all these, the clarity of expression, the clarity of ideas, the logical sequence of the approached phenomena are added, all representing qualities of this book, unique, for the time being, within the Cluj publishing environment.

The approach is neutral, rational, in a French Cartesian spirit, the author avoids historical exemplifications, and he prefers the examples of the present time in order to build a better future. We have much work to do in this area; besides the reconnection to the Western values (but we must not ignore the national character!), which, by this way, is done by Mr. Sorin Filip, we have the duty of the moral restoration of our cities as well, in order to bring back their identity which was lost during the troubled years of communism, because, just as Andreea Deciu asserted (in *"The Story of Houses"*, Simetria Publishing House, Bucharest, 2000), "a city is not only a juxtaposition of buildings, just as a house can never be only a construction made out of concrete

and bricks. A city is a space destined for living, and this is the reason why it is the embodiment of the thoughts and emotions of its inhabitants: it lives for as long as it is alive in front of the eyes of those who watch it, but especially as long as it exists in the memory and desires of those who know it."

We are dealing with a work of "quality", well written, without emotional effusions; Mr. Filip Sorin proves the fact that he is a specialist who is able to walk by himself, confident, on his bright road. The book is very useful to the specialists working in the field of urban planning, from administration, to the youths which are found in the process of development, either they are geographers, historians, sociologists, it is useful to every one of us as "people of the citadel".

Lecturer Păcurar Alexandru, PhD