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THE ROMANIAN POPULATION BY GENDER AND AGE GROUPS IN 2011

GR. P. POP¹, V. ZOTIC¹, DIANA E. ALEXANDRU¹

ABSTRACT. – The Romanian Population by Gender and Age Groups in 2011.

Following the previous studies on the demographic characteristics of the Romanian population, ethnicity and religion, this study covers the geodemographic issues of gender and age groups. As compared to the previous studies, our analysis covers these major population features in strong connection with the numerical evolution of the population, strongly determined by the socioeconomic background before 1990 and afterwards. We used the official data of the census in 2011 provided by the National Institute of Statistics. In order to create a representative picture of the Romanian population by gender and age groups, we employed the data illustrating the state of these two indicators in tables and maps. As compared to the values registered in 1992, the Romanian population in 2011 registered a decrease of 11.79%, relatively balanced in terms of gender structure, the male population holding a share of 48.65% and the female population, a share of 51.35%. The age structure also reveals a relative balance between active adult population (56.32%) and the young and old population, together holding a share of 43.68%. Spatially, the structure of the Romanian population by gender and age structure, show differences at county level and also at a larger scale.

Keywords: *geodemographic structure, gender, age groups, sex ratio, county, geographical-historical provinces, Romania.*

1. INTRODUCTION

The study on demographic issues is of particular importance in shaping the socioeconomic development framework at national level. The study on population by gender and age structure reveals significant issues (demographic ageing, fertility level, sex ratio, active workforce, the age dependency ratio) to be taken into consideration when designing socioeconomic policies to sustainably support the evolution of a country and its inhabitants. The studies on the geodemographic features of the Romanian population have been subject of debate of the first author of this study since 1971 at regional level (Crişurilor Plain) followed in 1972 by a comprehensive analysis of the Romanian population from the economic perspective (*Romania. Economic Geography*, pp. 53-80 and *The Romanian Counties. Bihor County*, pp. 66-82 and 94-99). Up to 1990, seven other studies were elaborated, approaching different population issues at different spatial levels in Romania. After 1990, research has been widened, bringing out conclusive facts on the demographic issues at locality level (Dej, Mănăstireni and Țaga, Cluj County) at county level (*The Romanian Counties. Cluj County*) and then a series of studies debating the Romanian migration abroad (focusing on the period 1980-2001), national population structure, population by gender, age groups, ethnicity and religion.

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2. THE ROMANIAN POPULATION BY GENDER AND AGE GROUPS AT THE CENSUS IN 2011

The analysis of the population was carried out following the geographical pattern to highlight the specifics of the two geodemographic components within the borders of the Romanian territory. Thus, our results are shown taking into consideration the gender structure (results being grouped into three categories – male, female and both genders) and the age groups, in this case we taking into account three subsets of age, as follows: *0-19 years* (young population), *20-59 years* (adult population) and *60 years and over* (old population). The results and conclusions of the analysis are spatially accounted for counties and geographical-historical provinces.

2.1. The general structure of the Romanian population by gender and age groups at the census in 2011

According to the census in 2011, the general structure of the Romanian population (20,121,641 inhabitants) shows a relative balance in terms of gender structure, the male population registering 48.65% of the total resident population, as compared to the 51.35% registered by the female population, as displayed in table 1.

Table 1.

The Romanian population by gender and age groups at the census in 2011

Romania	Gender	Total resident population	0-19 years	%	20-59 years	%	60 years and over	%
	Both	20,121,641	4,298,099	21.36	11,331,512	56.32	4,492,030	22.32
	Male	9,788,577	2,206,383	22.54	5,702,392	58.26	1,879,802	19.20
	Female	10,333,064	2,091,716	20.24	5,629,120	54.48	2,612,228	25.28

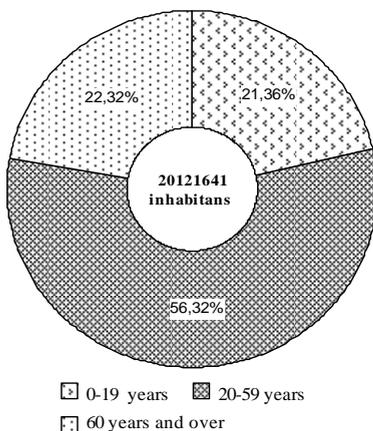


Fig. 1. The structure of the Romanian population by age groups in 2011.

From the situation displayed in table 1, we can note that in 2011, the major age groups of the Romanian population registered the following values of the total number of inhabitants: *both genders* – young (21.36%), adult (56.32%) and old (22.32%) (see fig. 1); in the case of *male population*, the young group registered 22.54%, the adult group had a share of 58.26% and the old group recorded 19.20% of the total number of men; in the case of *female population*, the young group was represented by 20.24% of the total women, the adult group recording 54.48%, and the old group holding a share of 25.28%.

2. 2. Spatial distribution of the Romanian population by gender and age groups at county level

In this section we present the main results of the research on the structure of the Romanian population by gender and age structure at county level.

2. 2. 1. The structure of the Romanian population by gender

Data reveal particularities at county level and also in terms of the major three age groups (see table 2).

a) *The young population group (0-19 years)*, holding a share of 21.36% of the total Romanian population, reveals differences at county level. The lowest share of young population (16.40%) is registered in Bucharest Municipality, followed by the counties of Brăila, Cluj, Hunedoara, Prahova, Teleorman, Timiș with values below the average (*up to 20%*). The highest values of the young population (*above 20%*) are registered in only six counties: Bacău, Bistrița-Năsăud, Botoșani, Iași, Suceava and Vaslui (26.17%). With values close to the average (20-22%) we find 15 of the counties, as follows: Alba, Arad, Argeș, Brașov, Buzău, Caraș-Severin, Constanța, Dâmbovița, Dolj, Giurgiu, Ilfov, Mehedinți, Olt, Tulcea and Vrancea.

Table 2.

The structure of the Romanian population by age groups (both genders) at county level in 2011

Crt. no.	Counties	Both genders	Total resident population	Age groups					
				0-19 years	%	20-59 years	%	60 years and over	%
	ROMANIA	BG	20121641	4298099	21.36	11331512	56.32	4492030	22.32
1	Alba	BG	342376	71281	20.82	190581	55.66	80514	23.52
2	Arad	BG	430629	89857	20.87	242926	56.41	97846	22.72
3	Argeș	BG	612431	124223	20.28	350653	57.26	137555	22.46
4	Bacău	BG	616168	149468	24.26	327393	53.13	139307	22.61
5	Bihor	BG	575398	127883	22.23	326078	56.67	121437	21.10
6	Bistrița-N.	BG	286225	69848	24.40	157225	54.93	59152	20.67
7	Botoșani	BG	412626	104211	25.26	212289	51.45	96126	23.30
8	Brașov	BG	549217	112439	20.47	323009	58.81	113769	20.71
9	Brăila	BG	321212	63169	19.67	176341	54.90	81702	25.44
10	Buzău	BG	451069	94413	20.93	240320	53.28	116336	25.79
11	Caraș-Sev.	BG	295579	60862	20.59	164484	55.65	70233	23.76
12	Călărași	BG	306691	69693	22.72	162364	52.94	74634	24.34
13	Cluj	BG	691106	130859	18.93	408579	59.12	151668	21.95
14	Constanța	BG	684082	143634	21.00	403187	58.94	137261	20.06
15	Covasna	BG	210177	47893	22.79	118653	56.45	43631	20.76
16	Dâmbovița	BG	518745	113747	21.93	291895	56.27	113103	21.80
17	Dolj	BG	660544	133483	20.21	367271	55.60	159790	24.19
18	Galați	BG	536167	118270	22.06	300012	55.95	117885	21.99
19	Giurgiu	BG	281422	60665	21.56	147756	52.50	73001	25.94
20	Gorj	BG	341594	75195	22.01	195078	57.11	71321	20.88
21	Harghita	BG	310867	70391	22.64	174391	56.10	66085	21.26
22	Hunedoara	BG	418565	82147	19.63	237126	56.65	99292	23.72

Crt. no.	Counties	Both genders	Total resident population	Age groups					
				0-19 years	%	20-59 years	%	60 years and over	%
23	Ialomița	BG	274148	63137	23.03	146364	53.39	64647	23.58
24	Iași	BG	772348	193783	25.09	427852	55.40	150713	19.51
25	Ilfov	BG	388738	85332	21.95	232672	59.85	70734	18.20
26	Maramureș	BG	478659	109803	22.94	272257	56.88	96599	20.18
27	Mehedinți	BG	265390	55197	20.80	145206	54.71	64987	24.49
28	Mureș	BG	550846	123353	22.39	304368	55.25	123125	22.35
29	Neamț	BG	470766	107908	22.92	244849	52.01	118009	25.07
30	Olt	BG	436400	90271	20.69	235904	54.06	110225	25.26
31	Prahova	BG	762886	151806	19.90	430520	56.43	180560	23.67
32	Satu Mare	BG	344360	79876	23.20	198150	57.54	66334	19.26
33	Sălaj	BG	224384	51254	22.84	119997	53.48	53133	23.68
34	Sibiu	BG	397322	88456	22.26	228822	57.59	80044	20.15
35	Suceava	BG	634810	165418	26.06	332514	52.38	136878	21.56
36	Teleorman	BG	380123	73369	19.30	188878	49.69	117876	31.01
37	Timiș	BG	683540	133000	19.46	417232	61.04	133308	19.50
38	Tulcea	BG	213083	45783	21.49	119129	55.91	48171	22.61
39	Vaslui	BG	395499	103534	26.17	201054	50.84	90911	22.99
40	Vâlcea	BG	371714	75951	20.43	201072	54.09	94691	25.47
41	Vrancea	BG	340310	78332	23.02	177846	52.26	84132	24.72
42	Bucharest	BG	1883425	308905	16.40	1189215	63.14	385305	20.46

Source: National Institute of Statistics.

b) *The adult population group (20-59 years)* holds the largest share (56.32%) of the Romanian population at national level. Almost half of the national counties register values close to this average (55-57%), as follows: Alba, Arad, Caraș-Severin, Covasna, Dâmbovița, Dolj, Galați, Haghita, Hunedoara, Iași, Maramureș, Mureș, Prahova, Tulcea and Bihor. Only eight of the national counties register values above this average (57-59%), as follows: Argeș, Brașov, Cluj, Constanța, Gorj, Ilfov, Satu Mare and Sibiu. The highest shares of adult population at national level are registered in Timiș county and Bucharest Municipality with over 60% of the population. Another 17 counties register values below the average (below 55%): Bacău, Bistrița-Năsăud, Botoșani, Brăila, Buzău, Călărași, Giurgiu, Ialomița, Mehedinți, Neamț, Olt, Sălaj, Suceava, Vaslui, Vâlcea, Vrancea, while the lowest values are registered by Teleorman County (49.69%).

c) *The old population group (60 years and over)* holds a share of 22.32% of the total Romanian population, which is almost the same value of the young group (21.36%). The highest share of old population (over 25%) is registered in seven of the total counties at national level, as follows: Brăila, Buzău, Giurgiu, Neamț, Olt, and Teleorman (with the highest value in the country - 31.01%). Almost all the counties in Romania register values very close to the national average, either a little over or a little below. The lowest share of old population we find in Ilfov county (18.20%), along with other counties registering values below 21% (Bistrița-Năsăud, Brașov, Constanța, Covasna, Gorj, Iași).

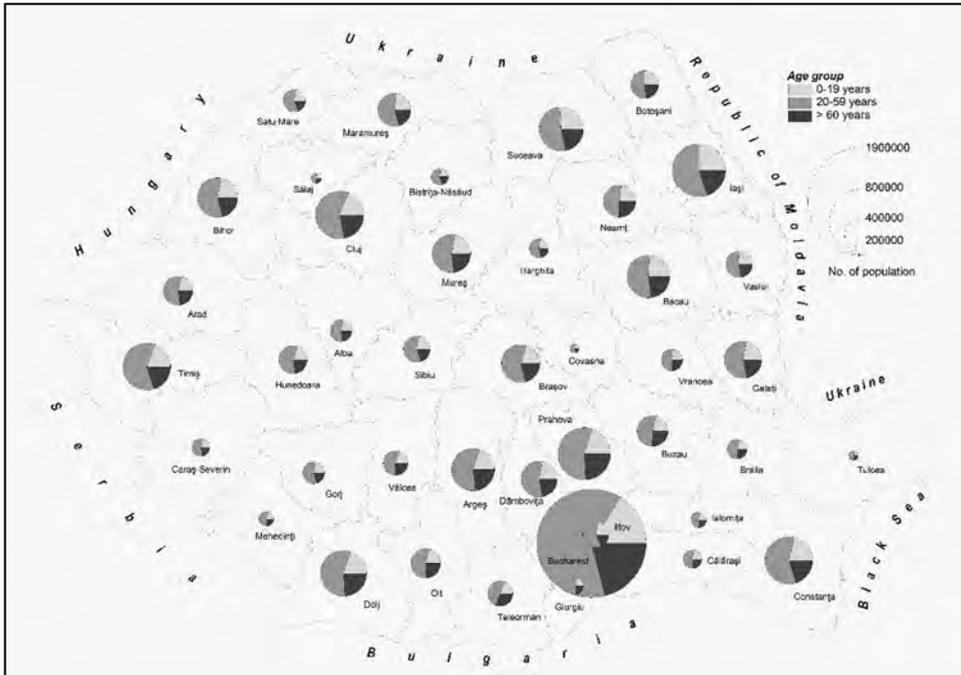


Fig. 2. The structure of the Romanian population by age groups (both genders) at county level in 2011.

2. 2. 2. The male population

The male population holds a share of 48.65%, which represents almost half of the entire national population. In case of three main age groups the shares held by each one of them is as follows: *the young group (0-19 years)* – 22.54%, *the adult group (20 - 59 years)* – 58.26%, and *the old group (60 years and over)* – 19.20% (see table 3 and fig. 2). The spatial distribution at county level reveals differences from one county to another.

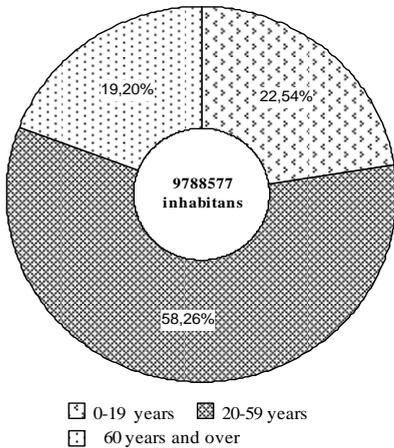


Fig. 3. The structure of the Romanian male population by age groups in 2011.

a) *the young group (0-19 years)* – with a share of 22.54% at national level – is distributed almost evenly among the counties. The lowest values of the young male population are registered in 5 counties: Brăila, Cluj, Hunedoara, Teleorman, Timiș and Bucharest municipality – with the lowest value at national level (18.00%). With values as the average (21-23%), we find 16 of the counties: Alba, Arad, Argeș, Brașov, Buzău, Caraș-Severin, Constanța, Dâmbovița, Dolj, Galați, Giurgiu, Mehedinți, Olt, Prahova, Tulcea and

Vâlcea, while other 16 counties register values above the average (23-25%): Bihor, Călărași, Covasna, Gorj, Harghita, Ialomița, Ilfov, Maramureș, Mureș, Neamț, Satu Mare, Sălaj, Sibiu și Vrancea. The highest values of young male population (over 25%) are registered in only 6 counties, as follows: Bacău, Bistrița-Năsăud, Botoșani, Iași, Suceava (27.28%) and Vaslui.

b) *the adult group (20-59 years)*, with a share of 58.26% at national level, is also distributed almost evenly at county level. Thus, 17 counties register values close to the average (57-59%): Alba, Arad, Bihor, Brăila, Caraș-Severin, Covasna, Dâmbovița, Dolj, Galați, Harghita, Hunedoara, Iași, Maramureș, Mehedinți, Mureș, Prahova and Tulcea, and other 15 counties register values below 57%: Bacău, Bistrița-Năsăud, Botoșani, Buzău, Călărași, Giurgiu, Ialomița, Neamț, Olt, Sălaj, Suceava, Vaslui, Vâlcea, Vrancea and Teleorman (with the lowest value in this group, of only 52.76%). The highest values of the male adult population (over 61%) are registered in 2 administrative units: Timiș county and Bucharest municipality (64.40%).

Table 3.

**The structure of the Romanian male population
by age groups at county level in 2011**

Crt. no.	County	Gender	Total population	Age groups					
				0-19 years	%	20-59 years	%	60 years and over	%
0	Romania	M	9788577	2206383	22.54	5702392	58.26	1879802	19.20
1	Alba	M	168451	37032	21.98	96786	57.46	34633	20.56
2	Arad	M	207508	46274	22.30	120898	58.26	40336	19.44
3	Argeș	M	298111	63710	21.37	176773	59.30	57628	19.33
4	Bacău	M	304000	76673	25.22	167513	55.10	59814	19.68
5	Bihor	M	279360	65527	23.46	163337	58.47	50496	18.08
6	Bistrița-N.	M	141613	35515	25.08	80198	56.63	25900	18.29
7	Botoșani	M	203186	53414	26.29	109875	54.08	39897	19.64
8	Brașov	M	267351	57865	21.64	160907	60.19	48579	18.17
9	Brăila	M	156661	32731	20.89	90071	57.49	33859	21.61
10	Buzău	M	219934	48534	22.07	122841	55.85	48559	22.08
11	Caraș-Severin	M	143852	31325	21.78	82953	57.67	29574	20.56
12	Călărași	M	150076	35982	23.98	82775	55.16	31319	20.87
13	Cluj	M	332579	66349	19.95	202192	60.80	64038	19.25
14	Constanța	M	333347	73504	22.05	201594	60.48	58249	17.47
15	Covasna	M	103454	24504	23.69	59952	57.95	18998	18.36
16	Dâmbovița	M	254397	58477	22.99	149682	58.84	46238	18.18
17	Dolj	M	322485	68781	21.33	186702	57.89	67002	20.78
18	Galați	M	264177	60728	22.99	153059	57.94	50390	19.07
19	Giurgiu	M	137575	31408	22.83	76271	55.44	29896	21.73
20	Gorj	M	168740	38810	23.00	99710	59.09	30220	17.91
21	Harghita	M	153572	35891	23.37	88964	57.93	28717	18.70
22	Hunedoara	M	203981	42117	20.65	119975	58.82	41889	20.54
23	Ialomița	M	134647	32250	23.95	75588	56.14	26809	19.91
24	Iași	M	381844	98899	25.90	219163	57.40	63782	16.70
25	Ilfov	M	189590	44177	23.30	116098	61.24	29315	15.46
26	Maramureș	M	234664	56555	24.10	137728	58.69	40381	17.21
27	Mehedinți	M	130333	28551	21.91	74330	57.03	27452	21.06
28	Mureș	M	268941	63418	23.58	153968	57.25	51555	19.17
29	Neamț	M	231508	55693	24.06	125486	54.20	50329	21.74

THE ROMANIAN POPULATION BY GENDER AND AGE GROUPS IN 2011

Crt. no.	County	Gender	Total population	Age groups					
				0-19 years	%	20-59 years	%	60 years and over	%
30	Olt	M	214285	46641	21.77	121479	56.69	46165	21.54
31	Prahova	M	369695	77977	21.09	217719	58.89	73999	20.02
32	Satu Mare	M	166344	40895	24.58	99211	59.64	26238	15.77
33	Sălaj	M	109194	26143	23.94	60987	55.85	22064	20.21
34	Sibiu	M	192714	45231	23.47	113941	59.12	33542	17.41
35	Suceava	M	312920	85363	27.28	168789	53.94	58768	18.78
36	Teleorman	M	186008	38209	20.54	98134	52.76	49665	26.70
37	Timiș	M	329176	67788	20.59	206632	62.77	54756	16.63
38	Tulcea	M	106006	23613	22.28	61371	57.89	21022	19.83
39	Vaslui	M	197704	53120	26.87	105594	53.41	38990	19.72
40	Vâlcea	M	180912	38891	21.50	101491	56.10	40530	22.40
41	Vrancea	M	166152	40081	24.12	90389	54.40	35682	21.48
42	Bucharest	M	871530	157737	18.10	561266	64.40	152527	17.50

Source: National Institute of Statistics.

M = Male, Bistrița-N. = Bistrița-Năsăud.

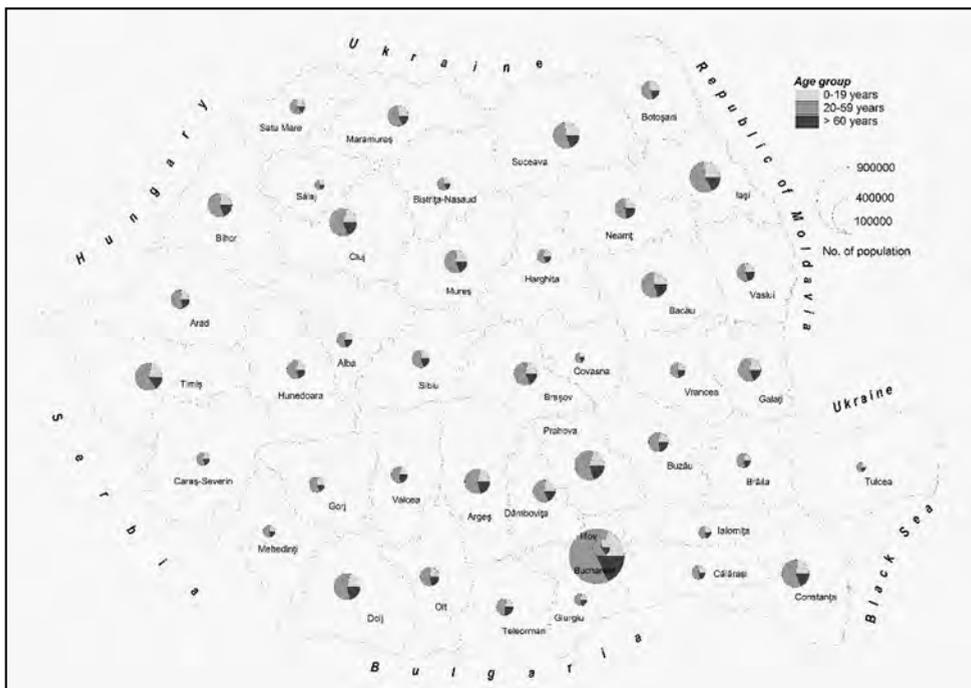


Fig. 4. The structure of the Romanian male population by age groups at county level in 2011.

About 10 counties register values between 57% and 59% adult population of the total male inhabitants: Argeș, Brașov, Cluj, Constanța, Gorj, Ilfov, Satu Mare and Sibiu.

c) *The old population group (over 60 years)* holds a share of 19.20% from the total population at national level. The highest number of male inhabitants over 60 years old we find in Teleorman county (26.70%), whilst other 8 counties register values over the national average (21-23%), as follows: Brăila, Buzău, Giurgiu, Mehedinți, Neamț, Olt, Vâlcea and Vrancea. The lowest values of elderly male population (below 19%) are registered in 15 of the Romanian counties: Bihor, Bistrița-Năsăud, Brașov, Constanța, Covasna, Dâmbovița, Gorj, Harghita, Iași, Maramureș, Satu Mare, Sibiu, Suceava, Timiș, Bucharest and Ilfov (with 15.46%, which is the lowest value of old male population at national level). The other 17 counties register values close to the national average (19-21%).

2. 2. 3. The female population

Representing 51.35% of the total national population in 2011, the female population brings out certain particularities as compared to the male one. In case of the three main age groups the shares held by each one of them is as follows: *the young group (0-19 years)* – 20.24%, *the adult group (20 - 59 years)* – 54.48%, and *the old group (60 years and over)* – 25.28% (see table 1 and fig. 3). The spatial distribution at county level reveals some particularities.

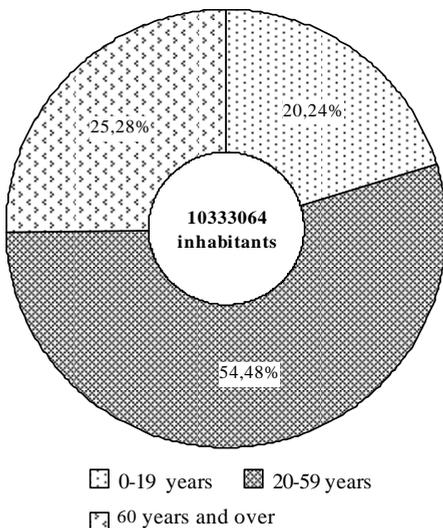


Fig. 5. The structure of the Romanian female population by age groups in 2011.

a) *The young female group (0-19 years)*, with a share of 20.24 % at national level is distributed almost evenly within the national territory. The lowest values of female young population group (below 19%) we find in the counties of Brăila, Cluj, Hunedoara, Prahova, Teleorman, Timiș and Bucharest, the capital city registering the lowest value at national level (14.94%). The highest values (over 23%) we find in the counties of Bacău, Bistrița-Năsăud, Botoșani, Iași, Suceava and Vaslui (25.49%, which is the highest at national level). The rest of the counties register values close to the average, about 15 of them with values of 19-21%, and other 14 counties with values of 21-23%.

b) *The adult female group (20-59 years)*, with a share of 54.48% of the total Romanian female population, is distributed evenly with the national territory. A number of 15 counties register values close to the national average (53-55%): Alba, Arad, Bihor, Bistrița-Năsăud, Caraș-Severin, Covasna, Dâmbovița, Galați, Harghita, Hunedoara, Iași, Mureș, Prahova and Tulcea, and only 5 counties register values of 51-53%: Bacău, Brăila, Olt, Sălaj and Vâlcea. Less than 51% of adult female population is registered in 11 counties: Botoșani, Buzău, Călărași, Giurgiu, Ialomița, Mehedinți, Neamț, Suceava, Teleorman (with only 46.75%), Vaslui and Vrancea. The highest number of female population (over 55%) is recorded in 11 counties: Argeș, Brașov, Cluj, Constanța, Gorj, Ilfov, Maramureș, Satu Mare, Sibiu, Timiș and Bucharest with the highest share of adult female population, of 62.06%.

Table 4.

**The structure of the Romanian female population
by age groups at county level in 2011**

No	County	Gender	Total population	Age groups					
				0-19 years	%	20-59 years	%	60 years and over	%
0	Romania	F	10333064	2091716	20.24	5629120	54.48	2612228	25.28
1	Alba	F	173925	34249	19.69	93795	53.93	45881	26.38
2	Arad	F	223121	43583	19.53	122028	54.69	57510	25.78
3	Argeş	F	314320	60513	19.25	173880	55.32	79927	25.43
4	Bacău	F	312168	72795	23.32	159880	51.22	79493	25.46
5	Bihor	F	296038	62356	21.06	162741	54.97	70941	23.96
6	Bistriţa-N.	F	144612	34333	23.74	77027	53.26	33252	22.99
7	Botoşani	F	209440	50797	24.25	102414	48.90	56229	26.85
8	Braşov	F	281866	54574	19.36	162102	57.51	65190	23.13
9	Brăila	F	164551	30438	18.50	86270	52.43	47843	29.07
10	Buzău	F	231135	45879	19.85	117479	50.83	67777	29.32
11	Caraş-S.	F	151727	29537	19.47	81531	53.74	40659	26.80
12	Călăraşi	F	156615	33711	21.52	79589	50.82	43315	27.66
13	Cluj	F	358527	64510	17.99	206387	57.57	87630	24.44
14	Constanţa	F	350735	70130	20.00	201593	57.48	79012	22.53
15	Covasna	F	106723	23389	21.92	58701	55.00	24633	23.08
16	Dâmboviţa	F	264348	55270	20.91	142213	53.80	66865	25.29
17	Dolj	F	338059	64702	19.14	180569	53.41	92788	27.45
18	Galaţi	F	271990	57542	21.16	146953	54.03	67495	24.82
19	Giurgiu	F	143847	29257	20.33	71485	49.70	43105	29.97
20	Gorj	F	172854	36385	21.05	95368	55.17	41101	23.78
21	Harghita	F	157295	34500	21.93	85427	54.31	37368	23.76
22	Hunedoara	F	214584	40030	18.65	117151	54.59	57403	26.75
23	Ialomiţa	F	139501	30887	22.14	70776	50.74	37838	27.12
24	Iaşi	F	390504	94884	24.30	208689	53.44	86931	22.26
25	Ifov	F	199148	41155	20.67	116574	58.54	41419	20.80
26	Maramureş	F	243995	53248	21.82	134529	55.14	56218	23.04
27	Mehedinţi	F	135057	26646	19.73	70876	52.48	37535	27.79
28	Mureş	F	281905	59935	21.26	150400	53.35	71570	25.39
29	Neamţ	F	239258	52215	21.82	119363	49.89	67680	28.29
30	Olt	F	222115	43630	19.64	114425	51.52	64060	28.84
31	Prahova	F	393191	73829	18.78	212801	54.12	106561	27.10
32	Satu Mare	F	178016	38981	21.90	98939	55.58	40096	22.52
33	Sălaj	F	115190	25111	21.80	59010	51.23	31069	26.97
34	Sibiu	F	204608	43225	21.13	114881	56.15	46502	22.73
35	Suceava	F	321890	80055	24.87	163725	50.86	78110	24.27
36	Teleorman	F	194115	35160	18.11	90744	46.75	68211	35.14
37	Timiş	F	354364	65212	18.40	210600	59.43	78552	22.17
38	Tulcea	F	107077	22170	20.70	57758	53.94	27149	25.35
39	Vaslui	F	197795	50414	25.49	95460	48.26	51921	26.25
40	Vâlcea	F	190802	37060	19.42	99581	52.19	54161	28.39
41	Vrancea	F	174158	38251	21.96	87457	50.22	48450	27.82
42	Bucharest	F	1011895	151168	14.94	627949	62.06	232778	23.00

Source: National Institute of Statistics.

c) *The old female group (60 years and over)*, with a share of 25.28% of the total female population, is distributed evenly within the territory. The highest number of old female population (over 29%) is registered in 4 counties (Brăila, Buzău, Giurgiu) and Teleorman with the highest value at national level (35.14%). About 15 counties have values between 24% and 26%: Alba, Arad, Argeş, Bacău, Botoşani, Caraş-Severin, Cluj, Dâmboviţa, Galaţi, Hunedoara, Mureş, Sălaj, Suceava, Tulcea and Vaslui, and other 14 counties register values below 24%: Bihor, Bistriţa-Năsăud, Braşov, Constanţa, Covasna, Gorj, Harghita and Iaşi. The county of Ilfov has the lowest share of old female population (20.80%), along with Maramureş, Satu Mare, Sibiu, Timiş and Bucharest. Other 9 counties register shares of 27-29%, as follows: Călăraşi, Dolj, Ialomiţa, Mehedinţi, Neamţ, Olt, Prahova, Vâlcea and Vrancea.

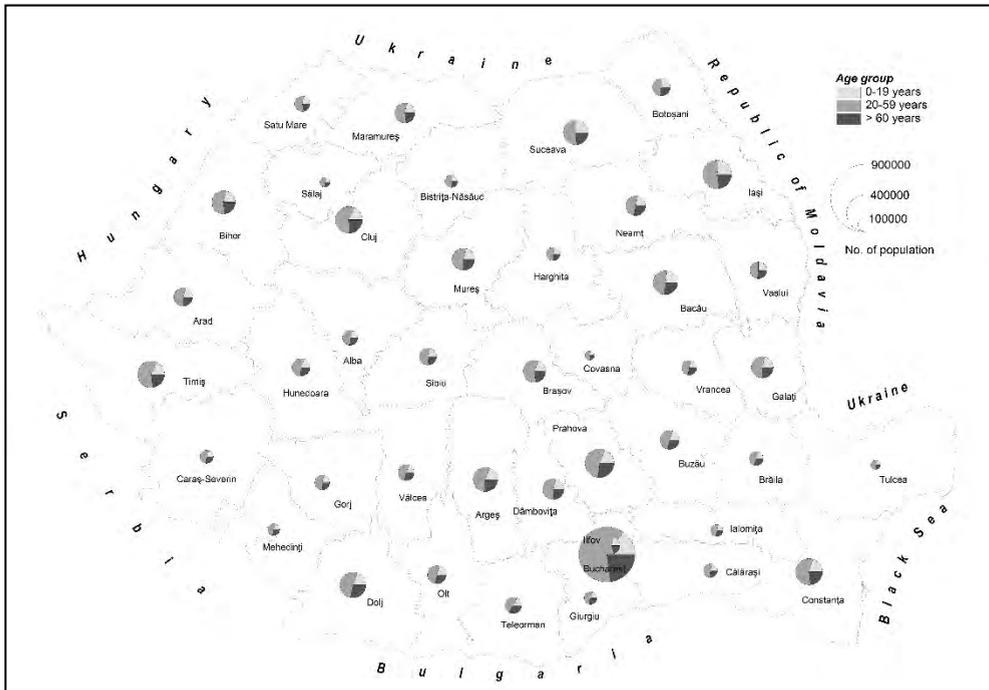


Fig. 6. The structure of the Romanian female population by age groups at county level in 2011.

2. 3. The structure of the Romanian population by age groups at the level of geographical-historical provinces in 2011

In this section of our study we analyze the distribution of the Romanian population at a larger territorial scale, at provinces level (*Transylvania, Moldavia, Dobrogea, Muntenia, Banat, Oltenia, Crişana* and *Maramureş*) to be able to emphasize on the differences in their spatial distribution and draw the general conclusions on our research topic. We follow

the same pattern of analysis, highlighting the state of the total Romanian population first by gender and then by age groups, followed by the analysis of the female and male population by age structure, considering the three main age groups.

2. 3. 1. The Romanian population by age structure

We worked with the data on the total population, by age structure, to show the particularities at the level of historical-geographical provinces (table 5).

a) *The young group (0-19 years)*, holding a share of 21.36%, is distributed among the provinces as follows: values of 20-22% are registered in the provinces of Transylvania, Dobrogea, Muntenia, Oltenia and Banat; values of 22-24% are recorded in the provinces of Crişana and Maramureş; the highest share of young population is registered in Moldavia province (24,43%); Bucharest municipality holds the lowest share of young population (only 16.40%).

Table 5.
The structure of the Romanian population by age groups (both genders) at the level of geographical-historical provinces in 2011

No.	Province	Gender	Total population	Age groups					
				0-19 years	%	20-59 years	%	60 years and over	%
	Romania	B	20121641	4298099	21.36	11331512	56.32	4492030	22.32
1	Transylvania	B	3981085	847921	21.30	2262751	56.84	870413	21.86
2	Moldavia	B	4178694	1020924	24.43	2223809	53.22	933961	22.35
3	Dobrudja	B	897165	189417	21.11	522316	58.22	185432	20.67
4	Muntenia	B	4297465	899554	20.93	2367763	55.10	1030148	23.97
5	Oltenia	B	2075642	430097	20.72	1144531	55.14	501014	24.14
6	Banat	B	1409748	283719	20.13	824642	58.50	301387	21.38
7	Crişana	B	575398	127883	22.23	326078	56.67	121437	21.10
8	Maramureş	B	823019	189679	23.05	470407	57.16	162933	19.80
9	Bucharest	B	1883425	308905	16.40	1189215	63.14	385305	20.46

Source: National Institute of Statistics.

b) *The adult group (20-59 years)*, holding a share of 56.32% at national level shows the following particularities at provinces level: 4 provinces register values of 55-57% (Transylvania, Muntenia, Oltenia and Crişana); 3 of them values of 57-59% (Dobrogea, Banat and Maramureş); the highest share of adult population is found in Bucharest (63,14%), while the lowest is recorded in the Moldavia Province (53.22%).

c) *The old group (60 years and over)*, holds a share of 22.32%, with 0.96% higher than the young one. Spatially, four of the provinces register values close to this average with shares of 21-23% (Transylvania, Moldavia, Banat and Crişana), followed by Dobrogea, and Maramureş with values below 21%, and Muntenia and Oltenia with values above the average (23-25%). The lowest values of the old population group are registered in Bucharest (19.80%) while the highest values are registered in Oltenia province (24.14%).

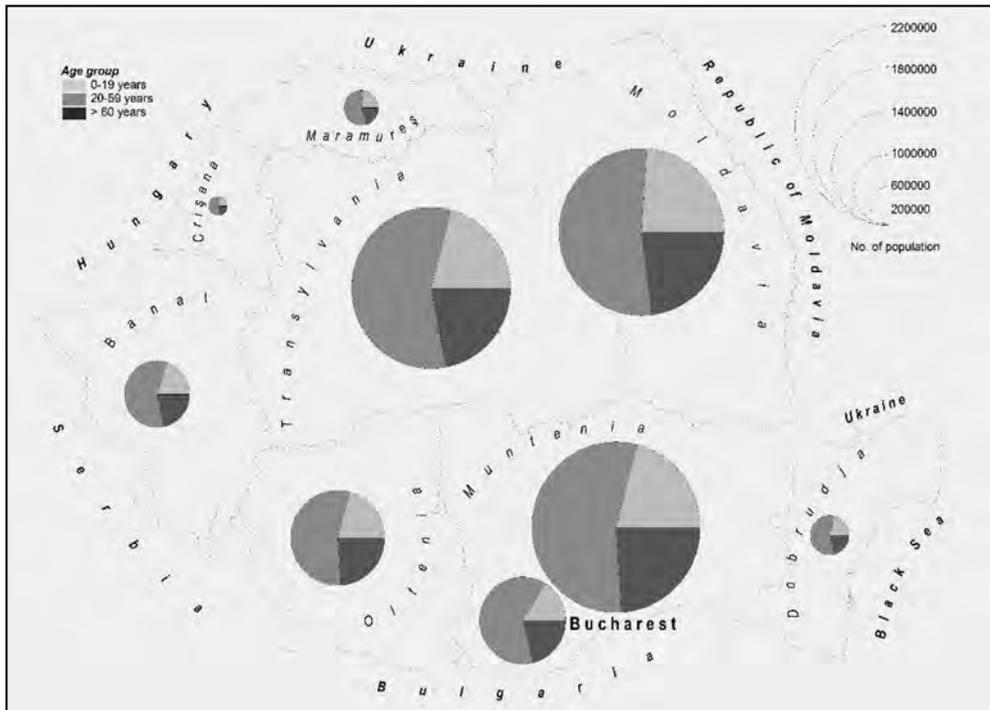


Fig. 7. The structure of the Romanian population by age groups (both genders) at provinces level in 2011.

2. 3. 2. The male population at national level

Representing 48.65% of the total Romanian population, the male population by age structure is distributed specifically among the provinces (see table 6).

a) *The young male population group (0-19 years)*, with a share of 22.54% of the total Romanian population, is distributed evenly at provinces level, registering values close to the average, as follows: 21-23%, in Transylvania, Dobrogea, Muntenia, Oltenia and Banat, 23-25% in Crişana and Maramureş. The lowest number of young male population is registered in Bucharest (18.10%) while the highest share of young male population is registered in Moldavia province (25.42%) (see table 6).

b) *The adult male population group (20-59 years)*, holds a share of 58.26% of the total population at national level. Values of 57-59% are registered in Transylvania, Muntenia and Oltenia, and values of 59-61% in Dobrogea, Banat and Maramureş. The lowest share of adult male population is registered in Moldavia province (52.29%) whereas the highest share of is registered in Bucharest (over 61%).

Table 6.

The structure of the Romanian male population by age groups at provinces level in 2011

No.	Province	Gender	Total population	Age groups					
				0-19 years	%	20-59 years	%	60 years and over	%
0	Romania	M	9788577	2206383	22.54	5702392	58.26	1879802	19.20
1	Transylvania	M	1941850	434065	22.35	1137870	58.60	369915	19.05
2	Moldova	M	2061491	523971	25.42	1139868	55.29	397652	19.29
3	Dobrudja	M	439353	97117	22.10	262965	59.85	79271	18.04
4	Muntenia	M	2096694	463455	22.10	1205952	57.52	427287	20.38
5	Oltenia	M	1016755	221674	21.80	583712	57.41	211369	20.79
6	Banat	M	680536	145387	21.36	410483	60.32	124666	18.32
7	Crişana	M	279360	65527	23.46	163337	58.47	50496	18.08
8	Maramureş	M	401008	97450	24.30	236939	59.09	66619	16.61
9	Bucharest	M	871530	157737	18.10	561266	64.40	152527	17.50

Source: National Institute of Statistics. M = Male

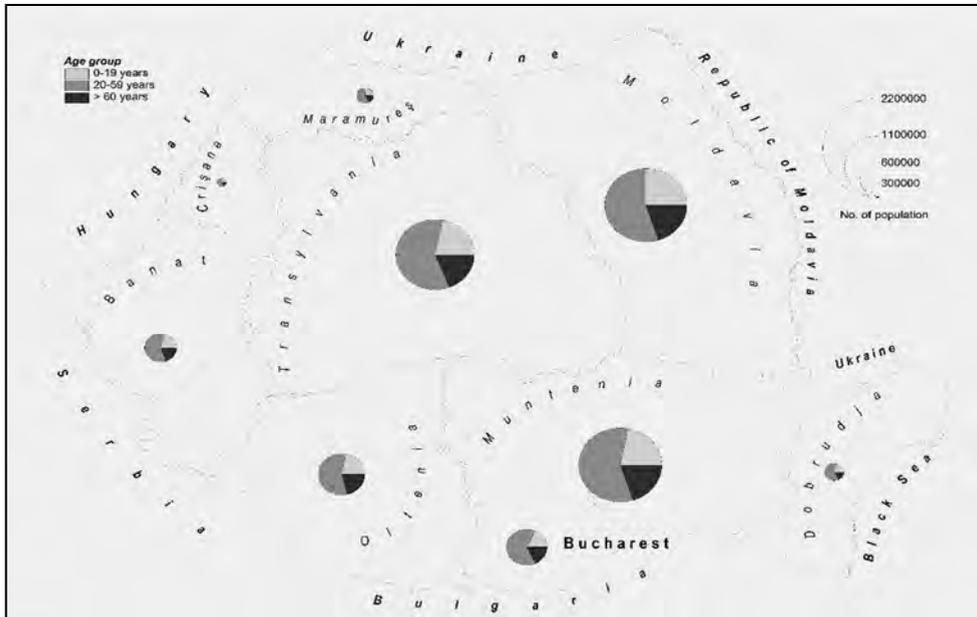


Fig. 8. The structure of the Romanian male population by age groups at provinces level in 2011.

c) The old male population group (60 years and over), with a share of 19.20% of the total Romanian population at national level, does not differentiate significantly among the provinces. Thus, in the provinces of Transylvania, Moldova and Dobrogea there are about 18-20% old male population, and a share of 20-22% in Muntenia and Oltenia. The highest values of old male population is registered in Oltenia province (20.79), while the lowest (below 18%), is registered in Banat, Crişana, Maramureş and Bucharest (17.50%) (see table 6).

2. 3. 3. The Romanian female population

The Romanian female population registers slightly higher values than the male population at national level (51.37%).

Table 7.

The structure of the Romanian female population by age groups at provinces level in 2011

No.	Province	Gender	Total population	Age groups					
				0-19 years	%	20-59 years	%	60 years and over	%
0	Romania	F	10333064	2091716	20.24	5629120	54.48	2612228	25.28
1	Transylvania	F	2039235	413856	20.29	1124881	55.16	500498	24.54
2	Moldova	F	2117203	496953	23.47	1083941	51.20	536309	25.33
3	Dobrudja	F	457812	92300	20.16	259351	56.65	106161	23.19
4	Muntenia	F	2200771	436099	19.82	1161811	52.79	602861	27.39
5	Oltenia	F	1058887	208423	19.68	560819	52.96	289645	27.35
6	Banat	F	729212	138332	18.97	414159	56.80	176721	24.23
7	Crişana	F	296038	62356	21.06	162741	54.97	70941	23.96
8	Maramureş	F	422011	92229	21.85	233468	55.32	96314	22.82
9	Bucharest	F	1011895	151168	14.94	627949	62.06	232778	23.00

Source: National Institute of Statistics. F = Female

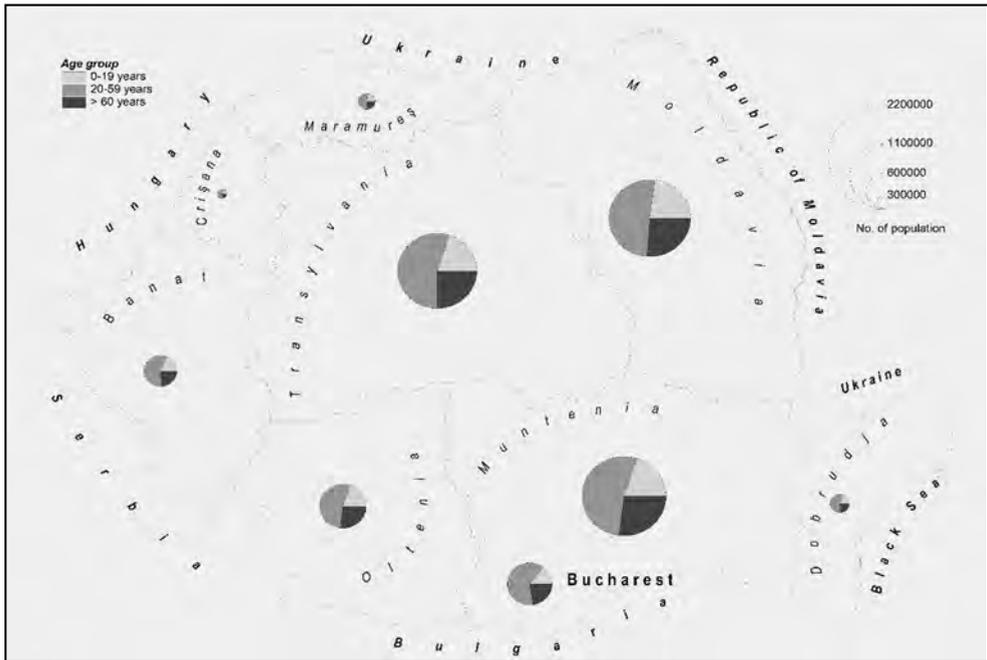


Fig. 9. The structure of the Romanian female population by age groups at provinces level in 2011.

a) *The young female population group (0-19 years)* holds a share of 20.24% of the total young female population at national level. In the provinces of Transylvania, Dobrogea, Muntenia and Oltenia the share of young female population is of 19-21%, followed by the provinces of Crişana and Maramureş with shares of 21-23%. The highest number of young female population is registered in the province of Moldavia (23.45%), while the lowest values are registered in the province of Banat (below 19%) and Bucharest (14.94%) (table 7).

b) *The adult female population group (20-59 years)*, holds a share of 54.48% of the total female population at national level. There are also differences in the spatial distribution at provinces level, as follows: the provinces of Transylvania, Crişana and Maramureş have values of 54-56%; the provinces of Moldova, Muntenia and Oltenia register values below 54%; the provinces of Dobrogea and Banat register values of 56-58%. The highest number of adult female population is registered in Bucharest (62.06%).

c) *The old female population group (60 years and over)* holds about a quarter of the total female population in Romania (25.28%). There are three provinces (Transylvania, Moldova and Banat) with registered values very close to this average share (24-26%), whereas shares below 24% are registered in the provinces of Dobrogea, Crişana, and Maramureş (the lowest share – 22.82%) and Bucharest. The highest number of old female population is registered in the province of Muntenia (27.39%) and Oltenia.

2. 4. The sex ratio

The sex ratio is calculated as the ratio between the number of female persons for 100 male persons at national level. Since our study covers the demographic aspect of gender structure, we considered suitable to show the values of this indicator at county and provinces level. In this case the value of the sex ratio at national level (women for every 100 men) shows the general ratio of 106 women for every 100 men, whereas in case of age groups, the young and adult groups register close values of 95 women for every 100 men and 98 women for every 100 men. In the case of the old group the values are significantly different, of 139 women for every 100 men, showing a decrease in the number of men due to the lower values of life expectancy of male population (~ 70) as compared to the value of life expectancy of female population, of approximately 77.4 (EUROSTAT, 2015).

2. 4. 1. The sex ratio at county level

The average value of the sex ratio at national level is of 106 women for every 100 men. At county level, the lowest values range from 100 women for every 100 men (registered in Vaslui county) up to 108 women for every 100 men (registered in the counties of Arad, Cluj and Timiş).

The detailed data on the sex ratio are presented in table 8 and fig. 10. We split the data into three classes of values, as follows:

- values between 100 and 102 – are registered in only six of the Romanian counties, distributed in the geographical-historical provinces as follows: in Moldavia (Iaşi and Vaslui), in Transylvania (Bistriţa-Năsăud and Harghita), in Oltenia (Gorj) and in Dobrogea (Tulcea);

- values between 102 and 104 are registered in five of the eight counties in the province of Moldavia (Bacău, Botoşani, Galaţi, Neamţ and Suceava), in four of the ten counties of the province of Muntenia (Călăraşi, Dâmboviţa, Ialomiţa and Teleorman), in two of the five counties of the province of Oltenia (Mehedinţi and Olt), in two of the ten counties of the province of Transylvania (Alba and Covasna) and in one of the counties of the province of Maramureş (Maramureş);

- values between 104 and 106 are registered in 17 of the national counties, distributed in the geographical-historical provinces as follows: six counties in the province of Muntenia (Argeş, Brăila, Buzău, Giurgiu, Ilfov and Prahova), five counties in Transylvania (Braşov, Hunedoara, Mureş, Sălaj and Sibiu, two counties in Oltenia (Dolj and Vâlcea) and one county in each of the rest of the provinces: Moldavia (Vrancea), Dobrogea (Constanţa), Banat (Caraş-Severin) and Crişana (Bihor);

- values between 106-108 are registered in only four of the Romanian counties, located in the western part of the country, two of them in the province of Banat (Arad and Timiş) one of them in Transylvania (Cluj) and another one in Maramureş (Satu Mare);

- the values registered in the capital city of Bucharest (116 women for every 100 men) are significantly higher than the national average (table 8).

Table 8.

The sex ratio at county level in 2011

Crt no.		M	F	%	Crt no.		M	F	%
	Romania	9788577	10333064	106		Romania	9788577	10333064	106
1	Alba	168451	173925	103	22	Hunedoara	203981	214584	105
2	Arad	207508	223121	108	23	Ialomiţa	134647	139501	104
3	Argeş	298111	314320	105	24	Iaşi	381844	390504	102
4	Bacău	304000	312168	103	25	Ilfov	189590	199148	105
5	Bihor	279360	296038	106	26	Maramureş	234664	243995	104
6	Bistriţa-N.	141613	144612	102	27	Mehedinţi	130333	135057	104
7	Botoşani	203186	209440	103	28	Mureş	268941	281905	105
8	Braşov	267351	281866	105	29	Neamţ	231508	239258	103
9	Brăila	156661	164551	105	30	Olt	214285	222115	104
10	Buzău	219934	231135	105	31	Prahova	369695	393191	106
11	Caraş-Sev.	143852	151727	105	32	Satu Mare	166344	178016	107
12	Călăraşi	150076	156615	104	33	Sălaj	109194	115190	105
13	Cluj	332579	358527	108	34	Sibiu	192714	204608	106
14	Constanţa	333347	350735	105	35	Suceava	312920	321890	103
15	Covasna	103454	106723	103	36	Teleorman	186008	194115	104
16	Dâmboviţa	254397	264348	104	37	Timiş	329176	354364	108
17	Dolj	322485	338059	105	38	Tulcea	106006	107077	101
18	Galaţi	264177	271990	103	39	Vaslui	197704	197795	100
19	Giurgiu	137575	143847	105	40	Vâlcea	180912	190802	105
20	Gorj	168740	172854	102	41	Vrancea	166152	174158	105
21	Harghita	153572	157295	102	42	Bucharest	871530	1011895	116

Source: National Institute of Statistics. Bistriţa-N. = Bistriţa-Năsăud, Caraş-Sev. = Caraş-Severin

THE ROMANIAN POPULATION BY GENDER AND AGE GROUPS IN 2011

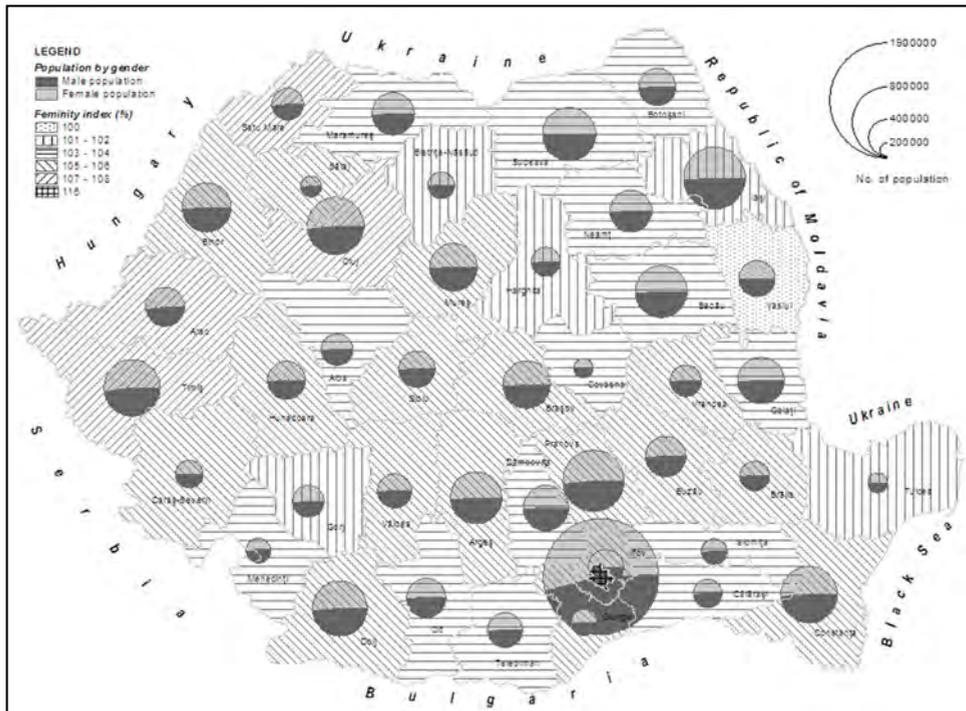


Fig. 10. The sex ratio of the Romanian population at county level in 2011.

The overall high values of sex ratio are firstly determined by the weight of the old female group of population in the overall population number of each administrative unit, which is directly connected to the fact that women tend to have greater life expectancy at the age of 60 (Huenchuan, 2010).

2. 4. 2. The sex ratio of the Romanian population in the geographical-historical provinces in 2011

At a larger scale, the values of the sex ratio are more homogenous and the discrepancies at county level are no longer visible. When analyzing the data registered at the level of geographical-historical provinces, we were able to synthesize the ratio between the female and the male population.

The highest values of the sex ratio (of 107 women for every 100 men) is registered in the province of Banat, the province of Crișana recording values equal to the national average, while the rest of the provinces register values between 103 and 105 women for every 100 men, their values not being much different. However, in the case of Muntenia province, if we take into account the value of sex ratio registered in the capital city the average value increases up to 108 women for every 100 men. Bucharest

Table 9.
The feminity index of the Romanian population at provinces level in 2011

Crt. no.		M	F	%
	Romania	9788577	10333064	106
1	Transylvania	1941850	2039235	105
2	Moldova	2061491	2117203	103
3	Dobrudja	439353	457812	104
4	Muntenia	2096694	2200771	105
5	Oltenia	1016755	1058887	104
6	Banat	680536	729212	107
7	Crişana	279360	296038	106
8	Maramureş	401008	422011	105
9	Bucharest	871530	1011895	116

Source: National Institute of Statistics.

capital city registers the highest value of sex ratio in the country (116 women for every 100 men). Thus, we have only two classes of values of the sex ratio in which we can integrate the Romanian geographical-historical provinces, as follows: values between 103 and 104 women for every 100 men – which are the lowest values at provinces level – are recorded in Moldavia, Dobrogea and Oltenia; and the value of 105 women for every 100 men, which is recorded in three historical provinces: Maramureş, Transylvania and Muntenia (see table 9 and fig. 11).

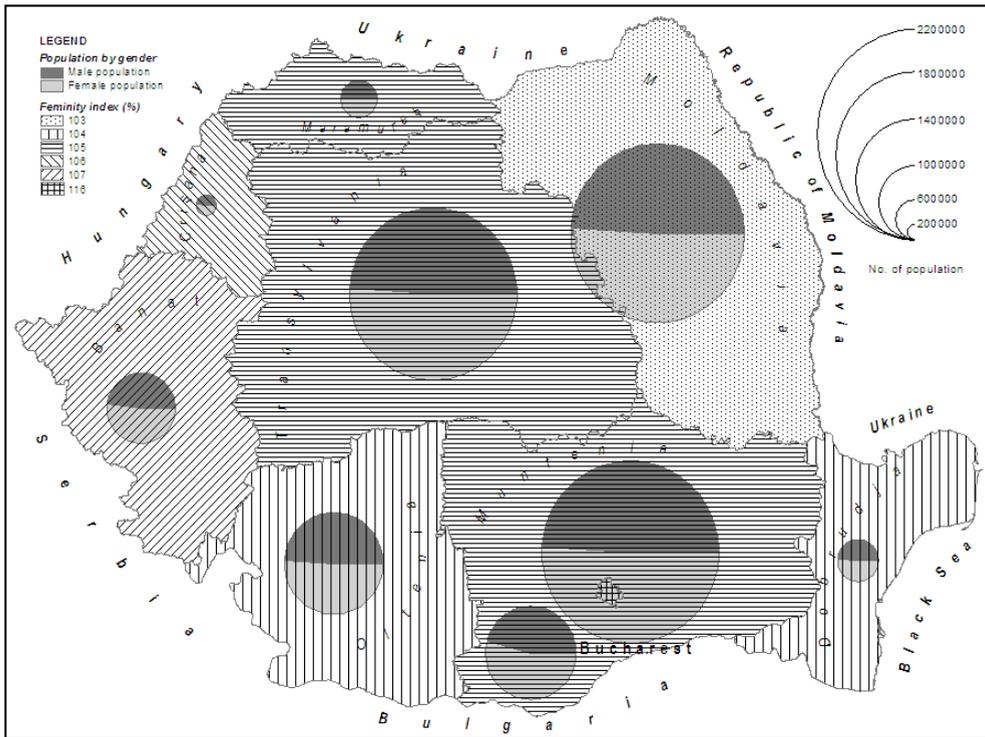


Fig. 11. The sex ratio of the Romanian population at provinces level in 2011.

3. CONCLUSION

The geodemographic issue analyzed in our study was the structure of the Romanian population by gender and age groups as registered at the census in 2011 (data provided by the National Institute of Statistics). The numerical evolution was graphically displayed through maps and graphs at two different scales: county level and provinces level. The topic of population evolution and structure has previously been debated by the authors and the results (ethnic and religious structure at national level) can be easily correlated with the present ones. As compared to the values registered in 1992, the Romanian population in 2011 registered a decrease of 11.79%, relatively balanced in terms of gender structure, the male population holding a share of 48.65% and the female population, a share of 51.35%. The age structure also reveals a relative balance between active adult population (56.32%) and the young and old population, together holding a share of 43.68%. In 2011, the age dependency ratio between the people younger than 15 or older than 64 to the working age population (15-64 years) was of 43% and increasing (The World Bank, 2015). Spatially, the structure of the Romanian population by gender and age structure, show differences at county level and also at a larger scale.

The results show that the young group holds an average share of 21.36% of the total national population, with the highest values in Vaslui county (26.17%) and the lowest in Bucharest (16.40%). The adult group registers the highest values in Bucharest (63.14) and Teleorman county (49.69%), while the old group of population holds the highest shares in the counties of Teleorman (31.01%) and Ilfov (18.20%).

The lowest share of young male (18.00%) and female (14.94%) population and the largest share of adult male (64.40%) and female (62.06%) population are registered in Bucharest. The spatial distribution of population reveals some highs and lows among which are worth mentioning the following: Vaslui county holds the highest values of young female population (25.49%) while the highest share of young male population (22.54%) is registered in Suceava county; Ilfov county holds the lowest shares of old male (15.46%) and female (20.80%) population; Teleorman county stands out through the highest values of old male (26.70) and female (35.14%) population and the lowest values of adult male (53.76%) and female (46.75%) population.

At a larger scale, the situation of the Romanian population by gender and age structure reveals particularities in each of the geographical-historical provinces. Thus, the province of Moldavia stands out through the highest values of the young population (both male and female) and the lowest shares of adult population (both male and female). The province of Maramureş registers the lowest values of the old (male and female) population (19.80%) while the highest share of old male population (20.79%) is registered in the province of Oltenia and the highest share of old female population is held by the province of Muntenia (27.39%).

The sex ratio calculated at county and provinces level shows parity in Vaslui County but reaches values up to 108 women for every 100 men in the counties of Cluj,

Arad and Timiș. Bucharest municipality show a particularly different situation registering the highest values in the country (116 women for every 100 men). Overall, the average value of the sex ratio in 2011, at county level, is of 106 women for every 100 men, and at the level of geographical-historical provinces the values range from 103 in Moldavia province to 107 in Banat province.

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THE EVALUATION OF ACCESSIBILITY TO HOSPITAL INFRASTRUCTURE AT REGIONAL SCALE BY USING GIS SPACE ANALYSIS MODELS: THE NORTH-WEST REGION, ROMANIA

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I. FODOREAN¹

ABSTRACT. – *The Evaluation of Accessibility to Hospital Infrastructure at Regional Scale by Using GIS Space Analysis Models: the North-West Region, Romania.* Easy access of the population to hospital infrastructure represents one of the main preoccupations of local and national authorities in the attempt to increase the degree of deliverance of quality medical services. The analysis of territorial distribution of various hospital categories- city, clinical, teaching, emergency hospitals- has revealed some areas of deficit in what regards the availability of various types of medical assistance. Identifying the areas of deficit from the point of view of accessibility to hospital infrastructure is carried out by means of a GIS model of space analysis (Cost Surface Modeling type) based on the calculation of access time from any location in the territory to the nearest hospital taking into consideration the vector databases (access ways, hospitals etc.), assignment (speed of motion on access ways, hospital type) and raster (access time).

Keywords: *hospitals, accessibility, GIS, spatial analysis, regional approach.*

1. INTRODUCTION

Ensuring access to health services is a key objective of social policies at the level of the European Union. According to strategic documents that guideline the health system reform in Romania, accessibility to medical care services is determined by the convergence between offer and demand of such services and disparities regarding accessibility are generated by intrinsic factors (heterogeneous quality of services of the same type), economic, social and geographical factors (Cocean P., 2004). Despite the statistics regarding the state of health in Romanian (indicating significant disparities in comparison with other EU countries) and despite the issuing of various reports which have voiced the need for a health system that is centered on patient needs (Vlădescu et al., 2010, pp. 87 - 96, Vlădescu et al., 2010, pp. 89 - 99), the action taken at governmental level point more in the direction of obtaining economical efficiency by reducing costs (Vlădescu and Astărăstoiaie, 2012, pp. 89 - 99).

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One of the recent actions in this respect has been the dissolution of a number of hospitals that had proven unprofitable from an economical point of view (Decree no. 303/2011) and which were not able to close contracts with the National Health Insurance Agency (Decree no. 345/2001).

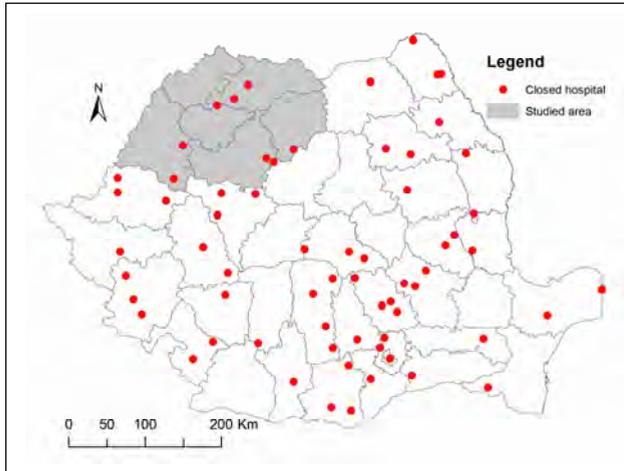


Fig. 1. Hospitals closed in Romania, according to Government Decree (H.G.) no. 345/2011.

Following the enforcement of this piece of legislation, 67 hospitals were dissolved in the entire country summing up to a total of 9200 hospital beds (The National Strategy of Hospital Rationalization, 2011). Excessive centralization in the Romanian healthcare system has inhibited some hospitals' possibility to become centered on particular healthcare services which could make them more competitive and compensate for deficit in other domains. Seldom are initiatives enacted in a manner that leads to the emergence of new hospitals which would, in turn,

help relieve the pressure occurring in some units overused as a consequence of inadequate distribution throughout the territory (for instance the establishment of the Oncology Centre in Oradea, December 2012).

The current study has been carried out for the North-West Region, one of the most developed regions in Romania, with a population of 2.495.247 inhabitants (according to the Population and Dwellings Census of 2011). This region includes six counties and is served by 57 hospitals (Table 1).

The current study attempts to analyze the space accessibility of hospitals in the North-West Region of Development at the level of year 2012, i.e. following the enactment of the previously mentioned piece of legislation.

From a terminological point of view there is need for operating the distinction between two terms associated to the analysis carried out: access to medical services (Soitu et al., 2013, pp. 123 – 133) and accessibility to specialty infrastructure (hospitals in this case). The former term refers to the legal right awarded to citizens to benefit from medical assistance. The latter term, accessibility, refers to the technical, spatial and temporal conditions that easily influence the ease with which a patient can reach a certain hospital.

The quantification of this complex of conditions is often made in relation to costs, distance and time in which the conveyance to a certain hospital can be made.

Accessibility is of utmost importance especially as approximately 30% of the population turns to hospital medical care every year (the Centre for Health Policies and Services, 2002) and 9% of the population turns to emergency hospital medical care every year (idem).

Table 1.**Statistical data regarding number of hospitals, population and localities in counties of the North-West Development Region**

County	No. of inhabitants	No. of Hospitals	No. of units of Territorial Administration	No. of localities	No. of localities with hospitals
Bihor	549752	12	100	456	7
Bistrița-Nasaud	277861	5	62	249	4
Cluj	659370	19	81	434	7
Maramureș	461290	10	76	246	6
Sălaj	217895	6	63	289	4
Satu Mare	329079	5	65	234	3
Total	2495247	57	447	1908	31

The evaluation of population accessibility to various types of hospitals is a recurrent issue in studies regarding territorial administration and in studies investigating the efficiency of the healthcare system. Thus, comparative studies have been carried out analyzing the accessibility as it is perceived by the population and the accessibility models issued by hospitals using GIS techniques (Fone et al., 2006, pp. 16 - 25), studies regarding the access of the population to specialized hospital services by determining travel time by the isochrones method (Patel et al., 2007, p. 12), urban accessibility of medical services (Guagliardo, 2004, pp. 273 - 283, Ohta et al., 2007, pp. 687 - 698, Apparicio et al., 2008, pp. 1 - 13, Simões and Almeida, 2011, pp. 25 - 29), accessibility of primary medical services (Munoz and Källestål, 2012, pp. 40 - 50), the multi-dimensional approach to accessibility to medical services and the relationship between the perception of accessibility to these services and the social and economic status of the inhabitants (Comber et al., 2011, pp. 44 - 54). Other authors have approached aspects of cost and quality regarding accessibility of the population to medical services (Tanke, 2012, pp. 282 - 287) or of regional accessibility of population to basic commercial services (Salze et al., 2011, p. 2).

Aspects regarding the equity of accessibility from the perspective of travel time have been tackled by Christie and Fone, (2003, pp. 344 - 350) with respect to various age groups of the population served by hospitals at regional level (in Wales Region).

Kalogirou and Foley, 2006, (pp. 52 - 68) propose a study methodology of hospital accessibility in which a number of different factors are included such as hospital size (number of hospital beds) available road infrastructure and potential (the demographical size of the localities). The two authors have accomplished a vector analysis of the road infrastructure with the purpose of calculating travel time from the centre of localities to the hospitals, thus forwarding a formula for the evaluation of accessibility (SAM - Spatial Accessibility Measure).

Studies regarding accessibility to hospital infrastructure which emphasize spatial analysis and mathematical modeling as main methodologies for research have been carried out by Sherman (2005, pp. 24-46), Gu et al. (2010, p. 17) using only vector databases and by identifying the relationships of dependence between population and

hospital unit as a support for spatial analysis identifying accessibility. More recently, Pedigo and Odoi (2010, pp. 924 - 930), tackle the problem of accessibility to hospital units specializing in cardio-vascular emergencies by using network analysis and euclidian models of evaluation of travel time. GIS techniques regarding access to medical services have been employed in numerous studies, with various work methodologies (Higgs, 2004, pp. 119 - 139), both in the case of analyses on structures of raster types as well as on vector type analyses.

The current study has been conceived and carried out as a complex model of spatial analysis by means of geo-informational software (well known due to their high rate processing abilities of databases with reference to territory) and the interpretation of data by means of spatial analysis equations.

2. METHODOLOGY

The proposed methodology of the present paper emphasizes the exploitation of vector and raster database structures of GRID type by means of a series of singular models of spatial analysis that have been synthesized in a single complex model the main purpose of which is the scoring and representation of the degree of accessibility to hospital infrastructure from any point on the surface of the territory under scrutiny.

2.1. The G.I.S. database

The database required in the process of spatial analysis has been established on the basis of thematic layers in vector and raster format, comprising access ways, building areas, hospitals etc., structured on three main types (primary, derived and modeled databases, Bilașco, 2008, p. 38), depending on the manner of their exploitation in the structure of the final model (Tab. 2).

Table 2.
The G.I.S. Database Structure

Name	Type	Structure	Attributes	Major Category
Roads	vector	line	Road type, maximum speed	Primary
Built-up area	vector	polygon	Name	Primary
Hospitals	vector	point	Hospital type, code, address	Primary
UTA	vector	polygon	Name, number of inhabitants	Primary
Travel speed on road types	raster	GRID	min/m ²	Modeled
Travel speed on road types	raster	GRID	minutes	Modeled
Access time to emergency hospitals and non-emergency hospital types	raster	GRID	minutes	Modeled
Scoring of access to emergency hospitals and non-emergency hospital types	raster	GRID	Scoring grades	Derived
Access to hospitals	raster	GRID	Scoring grades	Modeled

The primary database (roads, built-up areas) represent the development foundations of any GIS spatial analysis model and has been carried out on the basis of map information (vectorized on the maps on a scale of 1:50000), representing the databases of utmost importance in the evaluation process of accessibility to medical infrastructure in the territory under analysis.

The accessibility model is based on the maximum legal speed on certain types of roads; therefore they have been integrated in the modeling process as linear vector type structures having as main attributes the type of road and speed for each type.

Present day legislation establishes the maximum speeds depending on the road category (European, national, county, communal road) and the built-up area sections that they cross (Table 4). In order to identify the road sections which cross built-up areas, as early as the phase of setting up the primary database, we have resorted to the spatial analysis type overlay vector-vector (road/built-up area) using the Identity function incorporated in the geo-informational ArcGIS program (fig. 2).

The database representing the hospitals has been carried out considering the manner in which it is used within the model but also depending on the requirements of the ArcGIS program, which is used to model territorial accessibility.

The identification of hospitals was carried out based on available public data and they were spatially represented in the form of a vector-point thematic layer, thus being able to identify a number of 57 hospitals grouped in two major categories: emergency hospitals and non-emergency hospitals, with various other subcategories for each major type. The main component of the attribute database for the identified hospitals is represented by the code corresponding to each subcategory to which each hospital belongs (Table 3).

Table 3.

The structure of the attribute database and the location of hospital categories

Category	Subcategory	Code	Number	Location
Emergency hospitals	County emergency hospital	1	4	Zalău, Baia Mare, Satu Mare, Bistrița
	Clinical emergency county hospital	11	2	Cluj-Napoca, Oradea
	Clinical emergency hospital	111	1	Oradea
	Military emergency hospital	12	1	Cluj-Napoca
	Clinical emergency children's hospital	1112	1	Cluj-Napoca
	Cardio-vascular emergency hospital	1111	1	Cluj-Napoca
Non-emergency hospital types	Clinical hospital	112	1	Oradea
	Clinical teaching hospital	1121	1	Cluj-Napoca
	Municipal hospital	2	10	Sighetu Marmăției, Dej, Gherla, Turda, Câmpia Turzii, Carei, Oradea, Salonta, Beiuș, Mărghita
	Municipal clinical hospital	211	1	Cluj-Napoca

Category	Subcategory	Code	Number	Location
	City hospital	3	9	Sighetu Marmăției, Negrești-Oaș, Șimleu Silvaniei, Jibou, Beclean, Târgu Lăpuș, Beclean, Huedin, Aleșd
	Chronic illnesses hospital	4	1	Crasna
	Pneumology hospital	5	2	Satu Mare, Baia Mare
	Tuberculosis prevention clinic	51	1	Ilișua
	Clinical pneumology hospital	52	1	Cluj-Napoca
	Psychiatry hospital	6	4	Ștei, Nucet, Borșa (CJ), Cavnic
	Recovery hospital	7	1	Borșa (MM)
	Clinical recovery hospital	71	2	Cluj-Napoca, Oradea
	Private hospital	8	6	Zalău, Oradea, Satu Mare, Baia Mare (2), Bistrița
	Private centre for recovery, treatment and care	81	1	Zalău
	Penitentiary hospital	10	1	Dej
	Clinical hospital for infectious diseases	151	1	Cluj-Napoca
	Oncology hospital	17	1	Cluj-Napoca
	Clinical hospital for urology and renal transplant	30	1	Cluj-Napoca
	Hospital for infectious diseases, dermatology, venerology and psychiatry	152	1	Baia Mare
	Hospital for gastro-enterology and hepatology	31	1	Cluj-Napoca

The modeled and derived databases are represented by structures resulting from the accomplishment of intermediary models subjected to a logical diagram, in the present case subsequently identified with the raster cost data, access time to various hospital types, where the raster represents the deficit areas from the point of view of access etc.

2.2. Spatial analysis

Following the analysis of the database and considering the complexity of the structure in the final model (Fig. 2) we have decided to carry out the spatial analysis as two models (the calculation of access time to hospital infrastructure, in minutes, and identifying the areas of deficit from the point of view of access to hospital infrastructure for the two types of hospitals using the scoring technique), each displaying its own logical structure.

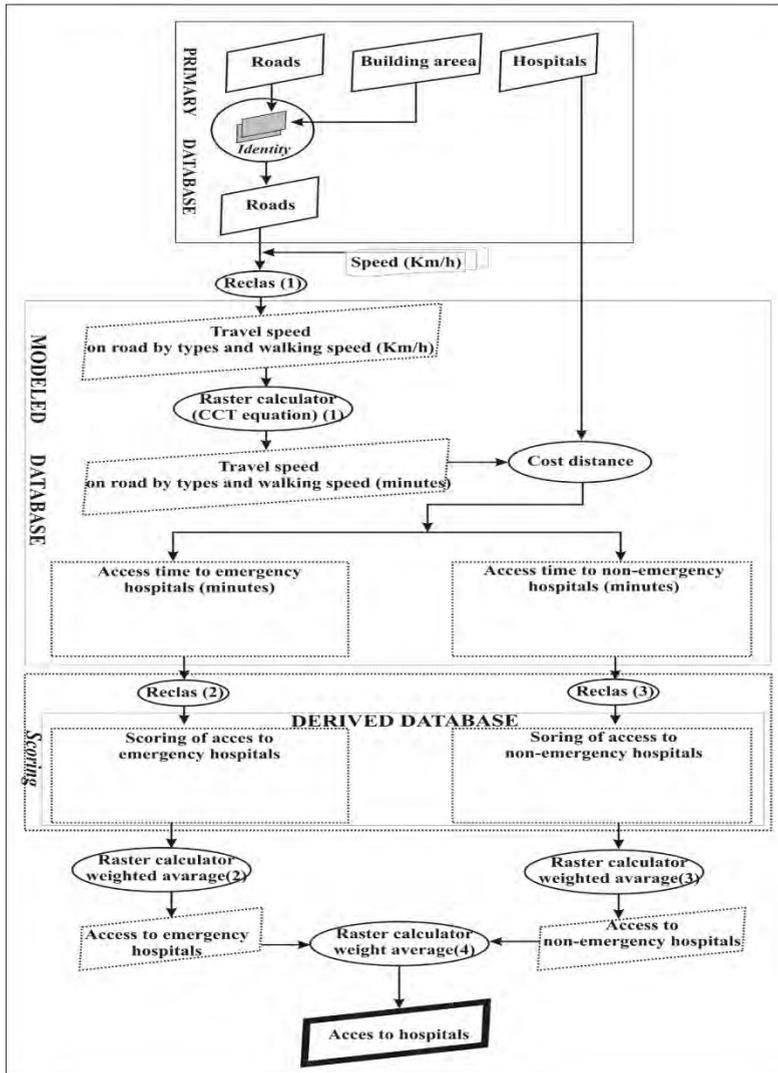


Fig. 2. The structure of the spatial analysis model.

3. RESULTS AND DISCUSSIONS

3.1. Modeling accessibility of hospitals

Most studies regarding accessibility and access time to various territorial infrastructures (Sherman, 2005, pp.24 - 46, Gu, 2010, p. 17, Munoz, 2012, pp. 40 - 50, Salze, 2011, p. 2) rely on vectorial models of analysis and representation of spatial reality as their work foundations.

These types of models can only be used in for identifying access time between different punctual locations connected through networks (roads) of vector type.

By means of the proposed model we aim at calculating access time in each point of the territory under scrutiny while considering the maximal travel speed on various road types as well as the average walking speed of a person on surfaces where there are no roads available.

The methodology for carrying out the model presupposes the use of raster specific databases of GRID type and their analysis by means of the function cost distance ArcGIS.

In the process of spatial analysis we have employed primary databases represented by roads in vector format that have been converted to raster format based on attribute database which represented the maximum travel speed, with a spatial resolution of the resulting raster of 10 m. All the cells of the raster that were not identified with a road network have been attributed a travel speed of 6 km/h. In choosing the resolution of the raster, the average 10 m width of a typical road was taken into consideration; in choosing the travel speed on surfaces with no vehicle access the average walking speed of a person was taken into account.

Using the cost distance function to calculate access time can only be implemented after the accomplishment of a raster with a value of the cell reflecting the time spent to traverse the respective cell at a particular speed, the so-called cost raster, together with the reference points represented by hospitals in relation to which the calculation of the access time in minutes will be carried out by summing up the value of the cell corresponding to the nearest reference point.

The main factor in modeling accessibility is represented by the creation of the database type raster GRID a cost raster. In order to model the cost raster database we have used the equation forwarded by Julião (1999), Drobne (2003, pp. 89 - 96, 2005, pp. 537 - 542), Drobne et al., 2005, pp. 213 - 218.

$$CCT = \frac{PS * 60}{TS * 1000}$$

CCT – cell crossing time (minutes), PS – pixel size, TS – travel speed (km/h)

Implementing the calculation equation in the GIS environment has been carried out by using the geo-informational ArcGIS program, more specifically, the raster calculator function based on a raster representing the maximum travel speed resulting from the conversion of the road network, for each cell:

$$(10 * 60) / ("speedfin" * 1000)$$

where: 10 – raster resolution, speedfin – raster representing maximum travel speeds.

The result of the equation is represented in the modeled raster type database which represents the cost raster with cell traversing speeds in minutes, varying according to travel speeds and representing one of the entry elements in the final accessibility model.

Table 4.

Maximum travel speed and cell traversing time depending on road type

No.	Road type	Travel speed Km/hour			
		Built-up areas		Outside localities	
		Travel speed	Cell crossing time (minutes)	Travel speed	Cell traversing time (minutes)
1	European road	50 / 70	0.012/0.0085	100	0.006
2	National road	50	0.012	90	0.0066
3	County road	50	0.012	90	0.0066
4	Communal road and service roads	30	0.02	30	0.02
5	-	6	0.01	6	0.01

The second factor that makes up the primary entry database to the structure of the accessibility model is symbolized by the point vector representing territorial identification of hospital units. The territorial identification of hospital units has been carried out by collecting GPS coordinates where possible as well by identification at street and postal box level. For increased ease in the retrieval of this database in the final model we have accomplished an attribute database based on codes and hospital categories (table 3). The databases representing the cost raster and the spatial identification of hospital units are the main elements in the calculation of access time in minutes using the cost distance function, which, according to ESRI, makes the calculation of the less cumulative cost starting from one or several origins and travelling through a cost surface.

For the mapping and spatial identification of territories with varying degrees of accessibility to emergency hospital infrastructure (Fig. 3 a, b) we have employed reference values depending on current Romanian legislation (Law no. 95/2006). Granting qualified first aid in cases of emergency is organized in such a manner as not to exceed 8 minutes for qualified first aid crews in urban areas, 12 minutes for qualified first aid crews in rural areas, 15 minutes for emergency or intensive care units in urban areas, 20 minutes for emergency and intensive care units in rural areas.

Spatial identification of access time to non-emergency hospitals (Fig. 3c, 3d) has been carried out using reference values for access time, making the analysis on the following accessibility classes: 0-10 minutes, 11-30 minutes, 31-60 minutes, 60-120 minutes and over 120 minutes.

Emphasizing accessibility for each type of hospital separately has been carried out with the help of the methodology for quantitative evaluation of the results obtained. To this end, the surfaces for all the intervals situated between reference values used in mapping were calculated while extracting the average access time in minutes for the entire territory under scrutiny (table 5).

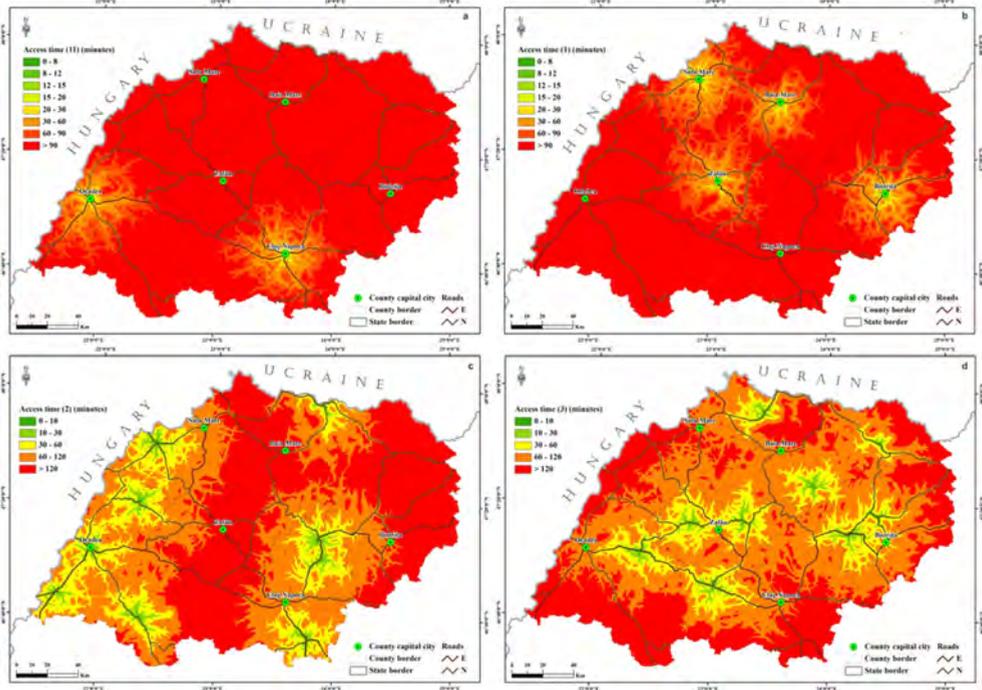


Figure 3. a. Access time to county clinical emergency hospital; b. Access time to county emergency hospital; c. Access time to municipal hospitals; d. Access time to city hospitals

Table 5.

Statistical values of accessibility

Subcategory	Code	Interval (minutes)	Surface (Km ²)	Average access time (minutes)	Subcategory	Code	Interval (minutes)	Surface (Km ²)	Average access time (minutes)
County emergency hospital	1	0 - 8	23.36	149.93	Tuberculosis Prevention clinic	51	0 - 10	5.81	252.85
		8 - 12	37.59				10 - 30	97.16	
		12 - 15	43.55				30 - 60	548.93	
		15 - 20	113.51				60 - 120	3465.08	
		20 - 30	417.38				>120	30046.93	
		30 - 60	2812.28						
		60 - 90	5058.52						
>90	25657.74								
County clinical emergency hospital	11	0 - 8	12.38	194.43	Clinical hospital for pneumology	52	0 - 10	10.82	237.31
		8 - 12	20.34				10 - 30	141.38	
		12 - 15	24.57				30 - 60	856.69	
		15 - 20	61.22				60 - 120	3928.33	
		20 - 30	201.09				>120	29226.70	
		30 - 60	1601.53						
		60 - 90	3098.24						
>90	29144.53								

THE EVALUATION OF ACCESSIBILITY TO HOSPITAL INFRASTRUCTURE AT REGIONAL SCALE BY USING ...

Subcategory	Code	Interval (minutes)	Surface (Km ²)	Average access time (minutes)	Subcategory	Code	Interval (minutes)	Surface (Km ²)	Average access time (minutes)
Clinical emergency hospital	111	0 - 8	5.73	306.44	Psychiatry hospital	6	0 - 10	296.60	169.63
		8 - 12	10.59				10 - 30	1296.05	
		12 - 15	12.56				30 - 60	2792.67	
		15 - 20	32.38				60 - 120	4406.80	
		20 - 30	106.15				>120	25371.80	
		30 - 60	744.83						
		60 - 90	1466.60						
>90	31785.07								
Military emergency hospital	12	0 - 8	6.65	237.31	Recovery hospital	7	0 - 10	57.17	375.82
		8 - 12	9.75				10 - 30	186.73	
		12 - 15	12.01				30 - 60	375.65	
		15 - 20	28.83				60 - 120	546.44	
		20 - 30	94.95				>120	32997.92	
		30 - 60	856.69						
		60 - 90	1631.64						
>90	31523.38								
Clinical emergency children's hospital	1112	0 - 8	6.65	237.31	Clinical recovery hospital	71	0 - 10	319.62	194.43
		8 - 12	9.75				10 - 30	1601.53	
		12 - 15	12.01				30 - 60	3098.24	
		15 - 20	28.83				60 - 120	4118.68	
		20 - 30	94.95				>120	25025.85	
		30 - 60	856.69						
		60 - 90	1631.64						
>90	31523.38								
Cardio-vascular emergency hospital	1111	0 - 8	6.65	237.31	Private hospital	8	0 - 10	802.80	125.04
		8 - 12	9.75				10 - 30	3557.11	
		12 - 15	12.01				30 - 60	6525.12	
		15 - 20	28.83				60 - 120	7215.39	
		20 - 30	94.95				>120	16063.49	
		30 - 60	856.69						
		60 - 90	1631.64						
>90	31523.38								
Clinical hospital	112	0 - 10	10.08	306.44	Private centre for recovery, treatment and care	81	0 - 10	7.90	224.57
		10 - 30	157.33				10 - 30	113.58	
		30 - 60	744.83				30 - 60	686.83	
		60 - 120	3288.60				60 - 120	4117.04	
		>120	29963.07				>120	29238.58	
Clinical teaching hospital	1121	0 - 10	10.82	237.31	Penitentiary hospital	10	0 - 10	12.35	234.01
		10 - 30	141.38				10 - 30	163.12	
		30 - 60	856.69				30 - 60	702.08	
		60 - 120	3928.33				60 - 120	3960.07	
		>120	29226.70				>120	29326.30	
Municipal hospital	2	0 - 10	90.51	115.52	Clinical hospital for infectious diseases	151	0 - 10	10.82	237.31
		10 - 30	1232.05				10 - 30	141.38	
		30 - 60	5124.14				30 - 60	856.69	
		60 - 120	13000.85				60 - 120	3928.33	
		>120	14716.36				>120	29226.70	

Subcategory	Code	Interval (minutes)	Surface (Km ²)	Average access time (minutes)	Subcategory	Code	Interval (minutes)	Surface (Km ²)	Average access time (minutes)
Clinical municipal hospital	211	0 - 10	10.82	237.31	Oncology hospital	17	0 - 10	10.82	237.31
		10 - 30	141.38				10 - 30	141.38	
		30 - 60	856.69				30 - 60	856.69	
		60 - 120	3928.33				60 - 120	3928.33	
		>120	29226.70				>120	29226.70	
City hospital	3	0 - 10	79.02	105.05	Clinical hospital for urology and renal transplant	30	0 - 10	10.82	237.31
		10 - 30	1018.86				10 - 30	141.38	
		30 - 60	4777.51				30 - 60	856.69	
		60 - 120	16439.02				60 - 120	3928.33	
		>120	11849.51				>120	29226.70	
Chronic diseases hospital	4	0 - 10	11.36	229.97	Hospital for infectious diseases, dermatology, venerology and psychiatry	152	0 - 10	10.27	258.60
		10 - 30	135.48				10 - 30	114.51	
		30 - 60	731.94				30 - 60	547.38	
		60 - 120	3906.89				60 - 120	2742.71	
		>120	29378.25				>120	30749.05	
Hospital for pneumology	5	0 - 10	20.70	226.06	Hospital for gastro-enterology and hepatology	31	0 - 10	10.82	237.31
		10 - 30	311.16				10 - 30	141.38	
		30 - 60	1344.80				30 - 60	856.69	
		60 - 120	4913.24				60 - 120	3928.33	
		>120	27574.01				>120	29226.70	

The analysis of accessibility differences brings to the surface the fact that almost all the categories of hospitals display obvious disparities. The calculation of the Gini index for surfaces associated to various time intervals displays values that generally exceed 0.7. Reduced values are present in the case of city hospitals (0.50) and municipal hospitals (0.48). The largest values of the Gini index are (between 0.82 and 0.84) are recorded in the case of clinical emergency county hospitals, military emergency hospitals, emergency children's hospitals, cardio-vascular emergency hospitals and clinical emergency hospitals. The most balanced distribution from the point of view of accessibility is recorded in the case of private hospitals (Gini index 0.40) and municipal hospitals (0.48).

From the point of view of surfaces associated with various time intervals, we notice that the largest values are recorded in the case of medium and high time intervals. This derives from the fact that the largest part of the territory is represented by surfaces to which access is carried out on foot and, consequently, when distance from access roads is longer, the access time increases significantly.

For average time (Table 6) of access to various types of hospitals the value of the Gini index decreases significantly (0.13). At county level, average values of access time display a relatively balanced distribution: Cluj 0.23, Bihor 0.23, Bistrița 0.19, Maramureș 0.17, Salaj 0.17, Satu Mare 0.18. In absolute terms, though, average values are high, in some cases exceeding values of 400 minutes. At the same time, the differences between average intervention time within counties are large, as there are occasionally differences

in access time four times greater between hospitals in various categories. The analysis of values on various categories of hospitals has revealed that the distribution of average access time values does not display large disparities; this is signaled by the values of the Gini index varying between 0.10 and 0.23. Nonetheless, as far as absolute values are concerned, the differences are significant both in the case of minimal time and in maximal time recordings and in the case of average access time as well.

3.2. Identifying areas of deficit from the point of view of access to hospital medical infrastructure

As can be deduced from the analysis of accessibility previously discussed, a large portion of the North-West Region displays deficiency as far as access to each hospital category under scrutiny is concerned. Identifying the areas of deficit from the point of view of access to medical hospital infrastructure has been carried out using GIS models based on quality scoring as the preferred method of spatial analysis.

3.2.1. Quality scoring of access time

The GIS methodology selected for identifying the areas with varying accessibility degrees throughout the territory, following the analysis of the modeled database obtained from the finalization of the accessibility model is the quality scoring of access time and their integration in GIS spatial analysis equations under the form of weighted average.

The necessity of adopting the methodology of quality scoring resides in the fact that the integration of access time as modeled grid type databases with concrete values, minutes, in GIS spatial analysis would lead to results that are extremely difficult to interpret and prone to error from the viewpoint of actual access time through their exaggeration resulting from the equation.

Scoring of access time to emergency hospital infrastructure has been carried out according to existing Romanian legislation, Law no. 95/14-th April 2006 which regulates the intervention time values in cases of emergencies and assigns quantitative grades in the interval 1-8 (1 being the minimal time of access- easy access; 8 being the maximal access time- difficult access) (Tab. 7). In order to evaluate accessibility to non-emergency hospital units scoring grades were assigned taking into consideration fixed time references, by assigning grades from 1-5 (1 being the minimal time of access- easy access; 5 being the maximal access time- difficult access) (Tab. 7).

In the process of carrying out the spatial analysis of databases, we have taken into consideration not only the type of hospital infrastructure, but also the importance that each hospital type holds for the population. In order to establish the importance and therefore the weight of each database, which represents the type of accessibility for a particular hospital type, the spatial analysis equation we have employed the method of the interview on a representative sample of 1425 subjects, made up of residents of the North-West Region with ages ranging from 18-65. After analyzing the answers to the submitted questions, we have obtained a view of the weight of each hospital type as presented in table 8.

Table 6.

Access time values on hospital types and counties

Subcategory	Code	County																		GINI index for average
		CLUJ			BIHOR			BISTRIȚA NĂSAUD			MARAMUREȘ			SĂLAJ			SATU MARE			
		Access time (minutes)			Access time (minutes)			Access time (minutes)			Access time (minutes)			Access time (minutes)			Access time (minutes)			
		Min	Max	Med	Min	Max	Med	Min	Max	Med	Min	Max	Med	Min	Max	Med	Min	Max	Med	
County emergency hospital	1	65.4	366.0	169.4	90.3	441.0	231.7	0	307.1	105.7	0	404.6	151.8	0	200.9	86.6	0	227.4	86.8	0.20
County clinical emergency hospital	11	0	326.7	107.1	0	319.9	119.9	115.0	455.1	251.6	156.4	535.9	310.2	53.9	253.8	158.1	112.6	455.2	250.5	0.20
Clinical emergency hospital	111	106.6	466.2	299.9	0	328.4	120.5	358.9	699.15	499.0	211.5	779.9	458.7	100.6	419.8	229.7	112.6	492.1	253.8	0.23
Military emergency hospital	12	0	353.4	107.3	136.0	453.2	284.8	115.8	455.1	251.6	156.4	535.9	310.2	53.9	253.8	158.1	177.9	455.2	291.8	0.17
Clinical emergency children's hospital	1112	0	353.4	107.3	136.0	453.2	284.8	115.8	455.1	251.6	156.4	535.9	310.2	53.9	253.8	158.1	177.9	455.2	291.8	0.17
Cardio-vascular emergency hospital	1111	0	353.4	107.3	136.0	453.2	284.8	115.8	455.1	251.6	156.4	535.9	310.2	53.9	253.8	158.1	177.9	455.2	291.8	0.17
Clinical hospital	112	106.6	466.2	299.9	0	328.4	120.5	358.9	699.15	499.0	211.5	779.9	458.7	100.6	419.8	229.7	112.6	492.1	253.8	0.23
Clinical teaching hospital	1121	0	353.4	107.3	136.0	453.2	284.8	115.8	455.1	251.6	156.4	535.9	310.2	53.9	253.8	158.1	177.9	455.2	291.8	0.17

Subcategory	County																		GINI index for average	
	CLUJ			BIHOR			BISTRIȚA NĂȘĂUD			MARAMUREȘ			SĂLAJ			SATU MARE				
	Access time (minutes)			Access time (minutes)			Access time (minutes)			Access time (minutes)			Access time (minutes)			Access time (minutes)				
	Min	Max	Med	Min	Max	Med	Min	Max	Med											
Clinical recovery hospital	71	0	326.7	107.1	0	319.9	119.9	115.0	455.1	251.6	156.4	535.9	310.2	53.9	253.8	158.1	112.6	455.2	250.5	0.20
Private hospital	8	65.4	348.0	169.3	0	319.9	119.2	0	308.1	105.7	0	404.6	151.8	0	209	86.6	0	227.4	86.8	0.14
Private center for recovery, treatment and care	81	65.4	366.0	188.2	90.3	441.0	234.3	183.5	523.7	325.0	66.1	604.4	288.6	0	244.4	88.2	51.7	349.0	168.7	0.20
Penitentiary hospital	10	0	454.2	155.3	236.9	554.0	368.7	15.11	355.3	158.5	56.4	436.0	222.1	33.7	324.2	182.5	165.0	410.7	275.7	0.17
Clinical hospital for infectious diseases	151	0	353.4	107.3	136.0	453.2	284.8	115.8	455.1	251.6	156.4	535.9	310.2	53.9	253.8	158.1	177.9	455.2	291.8	0.17
Oncology hospital	17	0	353.4	107.3	136.0	453.2	284.8	115.8	455.1	251.6	156.4	535.9	310.2	53.9	253.8	158.1	177.9	455.2	291.8	0.17
Clinical hospital for urology and renal transplant	30	0	353.4	107.3	136.0	453.2	284.8	115.8	455.1	251.6	156.4	535.9	310.2	53.9	253.8	158.1	177.9	455.2	291.8	0.17
Hospital for infectious diseases, dermatology, venerology and psychiatry	152	110.0	510.2	284.3	215.1	589.9	372.6	123.3	489.7	301.6	0	458.4	161.3	82.7	320.7	193.6	50.6	313.3	168.3	0.17

Subcategory	Code	County																		GINI index for average
		CLUJ			BIHOR			BISTRIȚA NĂȘĂUD			MARAMUREȘ			SĂLAJ			SATU MARE			
		Access time (minutes)			Access time (minutes)			Access time (minutes)			Access time (minutes)			Access time (minutes)			Access time (minutes)			
Min	Max	Med	Min	Max	Med	Min	Max	Med	Min	Max	Med	Min	Max	Med	Min	Max	Med	Min	Max	Med
Hospital for gastro-entereology and hepatology	31	0	353.4	107.3	136.0	453.2	284.8	115.8	455.1	251.6	156.4	533.9	310.2	53.9	253.8	158.1	177.9	455.2	291.8	0.17

Table 7.

Scoring of access time on main hospital categories

Category	Interval in minutes	Scoring grade
Emergency hospitals	0-8	1
	8-12	2
	12-15	3
	15-20	4
	20-30	5
	30-60	6
	60-90	7
	>90	8
Non-emergency hospitals	0-10	1
	10-30	2
	30-60	3
	60-120	4
	>120	5

Table 8.

Weight of databases used in the spatial analysis equation

Category	Subcategory	Code	Weight %
Emergency hospitals	County emergency hospital	1	15
	County clinical emergency hospital	11	20
	Clinical emergency hospital	111	25
	Military emergency hospital	12	5
	Clinical emergency children's hospital	1112	25
	Cardio-vascular emergency hospital	1111	10
Non-emergency hospitals	Clinical hospital	112	3
	Clinical teaching hospital	1121	5.5
	Municipal hospital	2	13,5
	Clinical municipal hospital	211	11
	City hospital	3	20
	Chronic diseases hospital	4	1.5
	Pneumology hospital	5	1.5
Tuberculosis prevention clinic	51	1.5	
Clinical hospital for pneumology	52	1.5	

Category	Subcategory	Code	Weight %
	Psychiatry hospital	6	4
	Recovery hospital	7	6
	Clinical recovery hospital	71	6.5
	Private hospital	8	2
	Private centre for recovery, treatment and care	81	1.5
	Penitentiary hospital	10	2
	Clinical hospital for infectious diseases	151	3
	Oncology hospital	17	7
	Clinical hospital for urology and renal transplant	30	4
	Hospital for infectious diseases, dermatology, venerology and psychiatry	152	2
	Hospital for gastro-enterology and hepatology	31	3

Taking into consideration the fact that in the case of the two types of hospital infrastructure the scoring grades have been defined for different time intervals, it is necessary to draw up two separate spatial analysis models the final databases of which to constitute entry elements into a singular model resulting in the territorial view of areas with differing degrees of accessibility (Fig. 4).

The main operation carried out on databases representing access time in minutes is their reclassification depending on the established scoring grades using the function reclassify of the ArcGIS program, thus obtaining the derivate databases (Fig. 5 a-d) that will be integrated in the spatial analysis equations and in the equations identifying access to the two types of hospital infrastructure.

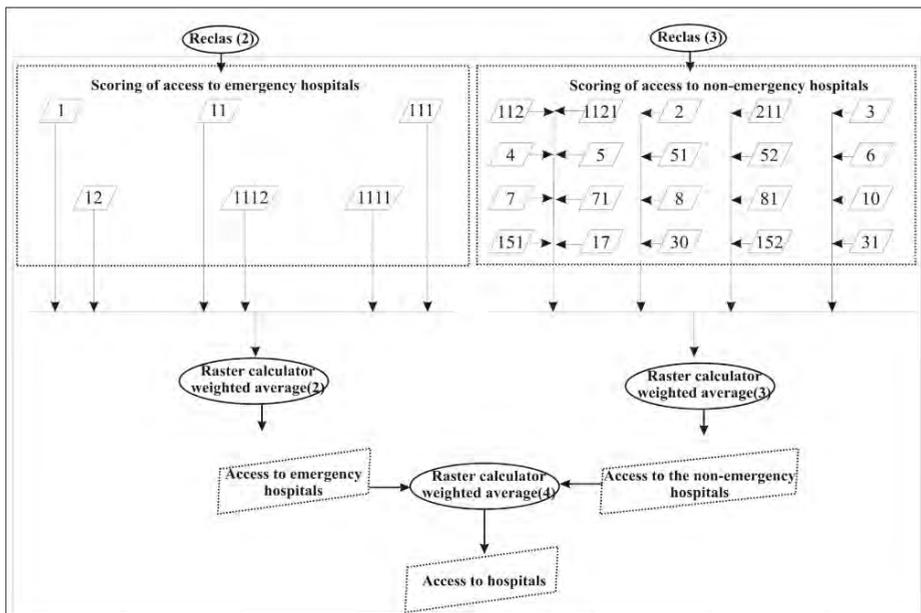


Fig. 4. Territorial accessibility models.

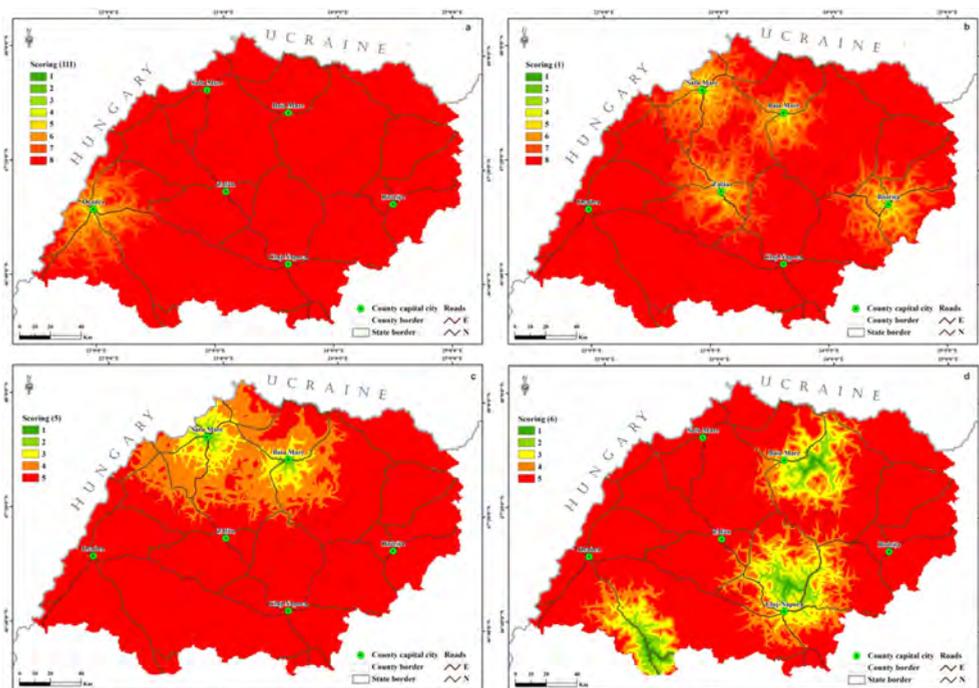


Fig. 5. a. Scoring grades for clinical emergency hospitals; b. Scoring grades for county emergency hospitals; c. Scoring grades for pneumology hospitals; d. Scoring grades for psychiatry hospitals.

The identification of surfaces with various degrees of accessibility (maximal accessibility areas and difficult access areas) has been carried out by using spatial analysis equations on the basis of derived databases resulting from the process of reclassification/scoring as entry elements in these equations.

In order to finalize the two intermediary models and to determine the areas with various accessibility degrees that are specific to the identification model characterizing accessibility to emergency hospitals(Fig. 6 a) and to non-emergency hospitals (Fig.6 b), we have conceived two spatial analysis equations to be implemented into the GIS model as follows:

- spatial analysis equation for emergency hospitals:

$$(„Scoring 1111” * 10) + („ Scoring 1112” * 25) + („ Scoring 12” * 5) + („ Scoring 111” * 25) + („ Scoring 11” * 20) + („ Scoring 1 „*15) / 100$$

where:

„Scoring 1111” – raster type GRID database representing access time scoring for accessibility to cardio-vascular emergency hospitals

10, 25 –the weight of each database in the final result

- spatial analysis equation for non-emergency hospitals:

$$\begin{aligned}
 & ("Scoring\ 31" * 3) + ("Scoring\ 81" * 1.5) + ("Scoring\ 8" * 2) + ("Scoring\ 71" * 6.5) + \\
 & ("Scoring\ 7" * 6) + ("Scoring\ 6" * 4) + ("Scoring\ 52" * 1.5) + ("Scoring\ 51" * 1.5) + \\
 & ("Scoring\ 5" * 1.5) + ("Scoring\ 4" * 1.5) + ("Scoring\ 30" * 4) + ("Scoring\ 3" * 20) + \\
 & ("Scoring\ 211" * 11) + ("Scoring\ 2" * 13) + ("Scoring\ 17" * 7) + ("Scoring\ 152" * 2) + \\
 & ("Scoring\ 151" * 3) + ("Scoring\ 1121" * 5.5) + ("Scoring\ 112" * 3) + \\
 & ("Scoring\ 10" * 2) / 100
 \end{aligned}$$

where:

„Scoring 4” – raster type GRID database representing access time scoring for accessibility to chronic diseases hospitals

3, 1.5 – the weight of each database in the final result

(Emergency deficit: scoring grades).

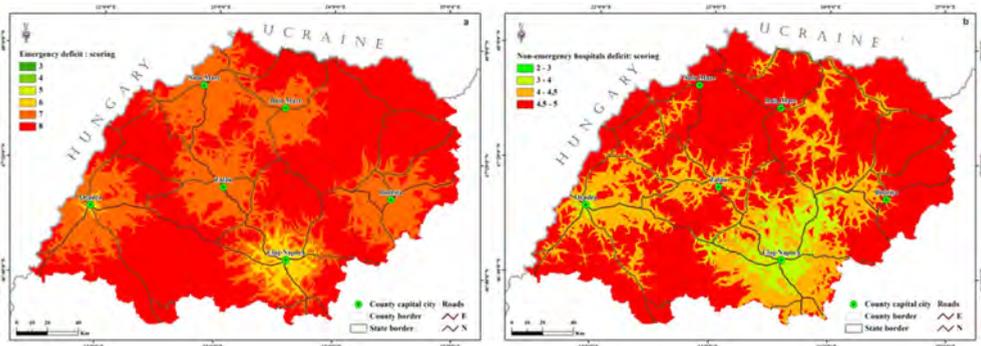


Fig. 6. a. Accessibility to emergency hospitals; b. Accessibility to non-emergency hospitals.

3.2.2. Identification of deficit areas

Overlay type spatial analysis carried out by means of the equations for spatial analysis has also been used in determining the deficit in territorial distribution for the entire network of hospitals (emergency and non-emergency). The overlay operation has been conducted by assigning a 60% weight to non-emergency hospitals and the remaining 40% to emergency hospitals, weights that have been obtained from the interpretation of interview results submitted to the questioned subjects, by means of the spatial analysis equation:

$$\begin{aligned}
 & ("Hospitals\ deficit\ (scoring\ grades)" * 60) + \\
 & ("Emergency\ deficit\ (scoring\ grades)" * 40) / 100
 \end{aligned}$$

The results are visible in a map of the territorial distribution deficit of the hospitals infrastructure in the North-West Development Region (Fig. 7).

The scoring grades range between 2.8 (maximal accessibility) and 6.5 (minimal accessibility). We notice the existence of apparently paradoxical situations in which some county capital cities display a position of deficit in relation to the hospital network, which can be explained by the small number of hospitals in the non-emergency category in these cities (Baia Mare, Satu Mare, Bistrița, Zalău).

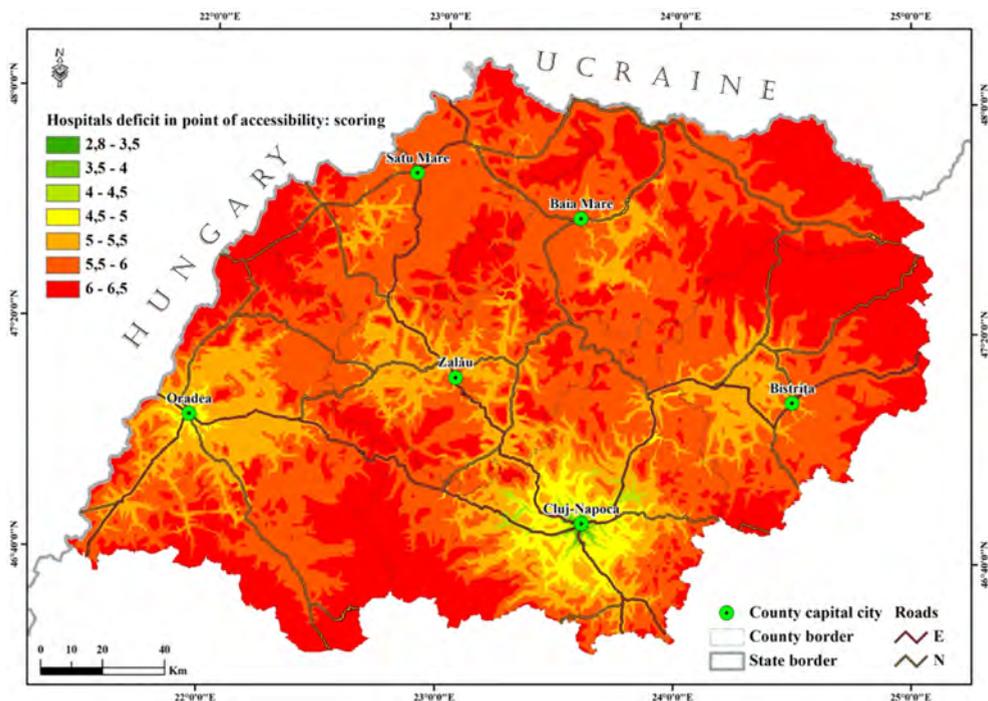


Fig. 7. Areas of deficit in the territorial distribution of the hospital infrastructure in the North-west Development Region.

4. Conclusions

The analysis carried out has revealed a series of practical information that can be useful to the administrative decisional body, such as the areas that display deficit from the point of view of accessibility to hospital units; the maps can be used by the large public by offering information related to the proximity of hospital units. The final databases can be made public by means of WebGIS applications so that people may choose the optimal locations in which to resort to medical care.

The category of emergency hospitals includes the following types: clinical emergency hospitals (Oradea), county clinical emergency hospitals (Cluj-Napoca, Oradea), county emergency hospitals (Baia Mare, Bistrița, Satu Mare, Zalău). Therefore, these are to be found in any county capital city, thus ensuring the appropriate service for areas of immediate proximity. Despite their presence in every county, though, the reference to standardized intervention time reveals the fact that most of the localities are situated in areas where access time exceeds 30 minutes. A particular case is that of the Cardiovascular emergency hospital and of the Clinical emergency children's hospital that are present only in Cluj-Napoca, therefore their accessibility is very low in relation to the territory of the six counties. To these two, the Military emergency hospital in Cluj-Napoca is added as it displays limited addressability.

For the category of non-emergency hospitals we notice a much better degree of accessibility in what regards access time, both at regional and county level. Thus, the hospitals with the highest accessibility are city hospitals, with an average of accessibility of 101.3 minutes, situated in an interval ranging between 64.5 minutes for the county of Sălaj and 127.2 minutes for the county of Bihor. At the opposite end we find recovery hospitals, characterized by the lowest accessibility level, with access time ranging around 368.1 minutes, situated in an interval ranging between 588.9 minutes for Bihor county and 211.0 minutes for Maramureș county. This fact can be explained by the territorial layout of these hospital types in the North-West Region with one such hospital in Cluj-Napoca, in a favorable position and with a second hospital situated in Borșa (MM), situated at the periphery.

The existing private hospitals are characterized by increased accessibility, with their position in county capital cities, (with the exception of Cluj county) and with their preferential position in relation to main access roads, thus contributing to the overall improvement of the situation.

In what regards the distribution of the areas of deficit in point of accessibility to the hospital network, the areas situated in the vicinity of the cities of Baia Mare, Satu Mare, Bistrița stand out, a fact that is not generated by the lack of hospitals but rather by the position of the respective cities in relation to the main access roads. Moreover, the areas situated at the Northern and North-East extremities of the region (the Maramureș Depression, the Oaș Depression, the Hills of Bistrița and the area Oaș-Codru) stand out; this characteristic derives from the scarcity of access roads and their poor quality, which in turn generates a maximum travel speed that is lower than normal. To these the areas in the south of the region are added bordering the counties of Cluj and Bihor, that are mountainous areas with a low density of main transport roads but which displays a network of good communal and service roads characterized by maximal speeds that are very low (30 km/h), with access mainly carried out on foot. The same situation is encountered in other mountainous areas, such as in the Western area of the region, bordering the counties of Bihor and Satu Mare.

The areas with increased favorable conditions are those situated in the immediate vicinity of the cities of Cluj-Napoca, Oradea, and Zalău, positioned on main access roads (E60, E81), which allow high speeds, both inside and outside localities (the maximal speed limit established for all building areas traversed by these two roads is 70 km/h).

Starting from these results, we foresee an opportunity to carry out similar studies in the attempt to identify potential locations for the establishment of new hospital units, possible locations for the establishment of patient transport units and heliports to make up for the difficult road accessibility.

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CENTRALISATION OR PERIPHERALISATION? A 'NEW DEAL' IN URBAN-RURAL RELATIONS

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ABSTRACT. – **Centralisation or Peripheralization? A 'New Deal' in Urban-Rural Relations.** Beginning with the new century a new concept of regional planning has established itself in Europe, being strongly related to long-term development, especially in post-industrial countries. Although the conceptual debate about such regions started relatively late, it has gained an important role in spatial planning and research. The need for a development towards a complex political multi-level system (supranational, nation states and local-regional) has become indispensable in a globalized world. An international undertaken in Germany, France, The Netherlands and Switzerland has shown that metropolitan regions are an important strategic tool for economic and regional development in all countries. The present paper aims to deal with the metropolization processes in Europe, comparing the main attitudes and approaches towards this concept, examining the way in which metropolitan regions have been understood in the academic literature. The paper aims also to gather and improve knowledge on the recent theoretical background which has promoted or has acted as the starting points in developing and elaborating metropolitan regions policies.

Keywords: *metropolitan region, centralization, peripheralization, uneven development*

1. INTRODUCTION

The political and economic changes that have incurred at the beginning of the 1990s, the importance and impact of globalisation, Europeanization and metropolization have brought about considerable changes in the territorial structures of the member states, along with a severe economic decline and deepening development differences between the East and the West, reconfiguring their social and spatial forms of organization. In this sense the key role of cities has been re-evaluated not only due to the fact that they represent the main location for economic, political and social changes, but also because they are the most important territorial actors behind all these changes. Furthermore, due to migration and new means of communication, centralization and peripheralization processes started to overlap each-other; growth, stagnation, shrinkage appearing simultaneously on different levels, affecting both the urban as well as the rural areas. In order to deal with these processes new concepts and tools for territorial

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development have been elaborated and as a result, the elaboration of new spatial planning strategies and establishment of new institutional support structures (metropolitan governance) has become indispensable.

During these territorial and structural changes the scientific, but also the public debate have paid great attention to the newly positioned cities and their hinterland, resulting in the increase in numbers of metropolitan regions all over the Europe while polycentric development concepts have become more widespread strategic and planning tools than ever before. A great amount of literature related to metropolitan areas, their location as well as the spatial distribution of city functions tries to give an impressive description of these areas but a very few of them concentrate on issues like where the metropolitan regions come from, what is the main theoretical and political background and approach, what do they represent in the context of centralization and peripheralization, what does this concept/policy mean to those who can't benefit from it. Also, little attention is paid to regions outside the metropolitan catchment areas (called as in-between-spaces) which could either show a dynamic growth, or a deep shrinkage. Are there any strategies for subsidizing these areas?

The paper aims to deal with the metropolitanization processes in Europe, comparing the main attitudes and approaches towards this concept, examining the way in which metropolitan regions have been understood in the academic literature. The paper aims also to gather and improve knowledge on the recent theoretical background which has promoted or has acted as the starting points in developing and elaborating metropolitan regions policies.

2. METROPOLITIZATION-PERIPHERALIZATION, CORE-PERIPHERY RELATIONS AND THE IN-BETWEEN-SPACES

Problems of uneven development, peripheralization are being discussed not only in geographical literature but they represent the main area of intervention among politicians, spatial planners, economists as well as historians. In this rural-urban duality, the city has always been associated with the idea of centrality, accumulation of resources and connectedness while the rural environment has long evoked the idea of periphery, closure and emptiness (Sohn, 2012), justifying the ideological scheme of dominance and dependence on the centre. Peripheralization has remained as a syndrome of distance, difference and dependence, emphasizing the relations to weaknesses in social, political, cultural or economic terms. Hechter (1975) even used the concept of "internal colonialism" referring to the powerful core region exploiting those on the fringes (Hechter, 1975, page 8). According to Blowers and Leroy (1994), periphery regions can be characterized as "geographically remote, economically marginal, politically powerless and socially homogenous" as peripheral communities encompass each of these characteristics in lesser or greater degree (Blowers and Leroy, 1994, page 203). The same authors point out that the process of dominance and dependence which characterizes peripheralization at sub-national levels can also be perceived at an international level.

Peripheral regions are the areas not sufficiently integrated at the given place and time in dominating structures, processes and systems (Marada *et al.*, 2006). Lagging behind, slow development, passiveness, closeness, unimportant marginal areas often became concepts most frequently associated with high outflow areas (Daugirdas and Burneika, 2006). Thomas (1989) also introduces the concept of "transfer dependency" highlighting the fact that the more transfers are allocated in the periphery, the more peripheries will tend to become dependent on central handouts (Thomas, 1989, page 218).

Like cohesion, peripherality also represents a complex, multifaceted societally, politically and economically defined concept. According to Markusen (1999) it even represents a "fuzzy concept" since it arguably lacks clarity, it difficult to operationalize and possesses multiple meanings (Markusen, 1999, page 2). Churski (2004) argues that peripherality – being a natural phenomenon – cannot always be considered negative, as not all problem regions are peripheral and not all peripheral regions must necessarily be problematic.

Metropolization processes contribute to major changes not only in the cities' internal structure but also in the transformation of the relationship with the surrounding regions. According to several schools the tie between them could be both strong and wide-ranging but also weak, diverting resources from the periphery. Many authors highlighted the hypothesis that the regional hinterland is no longer needed by metropolises as it does not offer the resources necessary for metropolitan development (Sassen, 1991; Castells, 1998; Kunzmann, 1998; Jalowiecki, 2000; Gorzelak and Smętkowski, 2008), emphasizing furthermore on the limitation and weakening links between the metropolis and its regional surroundings, the relative marginalization and the increasing development differences among them. Other discussions are focusing on the obliteration of the dichotomy between urban and rural areas, this latter being the main objective also for a polycentric development of the EU. Discussing about peripheralization, first we have to look at those main processes which have determined the appearance of peripheral regions in most of the European countries:

- Population decline as a consequence of low birth rates and an ageing population, large scale emigration which has lead to shrinking regions.
- Economic decline, industrial restructuring, increasing unemployment rates, slow and long-lasting privatization process, difficulties in the countries' external balance of payments have lead to losing ground in a globalizing world economy, resulting in an economic and one-sided political dependence (Lang, 2012).
- Neoliberal thinking which has appeared in regional policies has further concentrated on the development of large urban areas, neglecting the development of others in need (Weichart, 2008).

As Western Europe is usually associated with being the "central" or "core", very few studies are dealing with problems of decline and shrinking in core regions as well as the appearance of some "hidden champions in hidden regions" (Aring and Reutther, 2006, page 11), referring to new forms of peripheries and cores and to some of the changeovers taking shape together which overlaps at different spatial levels. From a Western European perspective, Eastern countries usually appear as peripheries, as countries sending out a high number of the population, although there is always the

possibility of finding these “hidden champions” with high levels of population inflow. As peripheries arise at different territorial levels, it depends on the social viewpoint, on the selected scale whether some regions are identified and stigmatized as being a periphery, giving this duality certain multi-scalar characteristics. It is crucial to recognize that processes of centralization and peripheralization are socially constructed phenomena and should not be considered as something given, meaning that this can be socially changed or reconstructed. Core-periphery relations and peripherality itself cannot be understood as a static concept, neither can modern social change be considered as uniform, linear and static processes since they all involve continuous transformation: not all cores or peripheries will follow similar developmental patterns and no historical movement can permanently determine the eternity of the status of cores and peripheries. This is what gives peripherality the characteristics of temporality. Angus and Shoemith (1993) have pointed out that “centres are as much dependent upon their margins as the margins are on the centre” (Angus and Shoemith, 1993, page 7).

Herrschel (2011) has defined the process of peripheralization in a geographic and social-communicative perspective referring to new patterns and practices in governance as: open, flexible, non-territorially defined, network based informal interpersonal and inter-institutional linkages. According to the author there are some actors along these linear linkages who are much less involved, who stand beside these networks, their interests and views being regarded as less important or even going unheard. The outcome of this process is peripheralization through “in-between-ness”, representing exclusion but not in a distance-based spatial point of view. The case with in-between spaces is the same: they are not situated on the fringe, they are not peripheries in the right sense of the word, they simply just do not benefit from the relevant governance policies. As a result such “in between spaces” are excluded or have a more restricted participation in policy making networks. In-between spaces reflect the notion of being left out, excluded, pushed aside or as Copus (2001) put it: “aspatial peripherality” (Copus, 2001, page 539). This has been the case with the metropolitan areas which form clusters inside a country with a strong formal or informal, policies and policy-maker networks, becoming separated from the other areas and regions which are outside this network. So in a geographical perspective the level of infrastructure development could be shaped not only by accessibility and the communication flows, but rather by the relationship networks between the main policy and institutional actors. Here peripheralization can be regarded as the result of being situated “between” the main communication flows (Herrschel, 2011).

3. THEORETICAL AND CONCEPTUAL BASIS: DEFINING METROPOLITAN REGIONS

To give a more detailed explanation of the concept, the economic theory of agglomeration, the growth pole-, cluster-, and the post-colonial theories may provide a useful starting point. The ideas of core and periphery have been present either explicitly or implicitly in both classical models (e.g. Alonso, 1964 theory of urban land use; Myrdal 1957 cumulative causation) as well as in structuralist and political-economic perspectives on uneven development (Wallerstein, 1974: world system theory, Krugman,

1991: core-periphery model, Porter, 1990: cluster theory). By analyzing these theories the multi-scalar nature of peripherality becomes evident, in the sense that Alonso's work emphasizes the core-periphery relation at urban level, Myrdal's focuses on the inter-regional or national scale while Wallerstein's work identifies cores and peripheries within the global economy. This is further reflected in the modern territorial structure regardless if we are talking about the EU, CEE countries or about Romania. Theoretical concepts of convergence and divergence reflect catching-up processes on the one hand, while dependence theories and cluster theories (e.g. Krugman and Porter) suggest further growth for highly developed areas. As Porter has put it, in a world of economic integration clusters play a prominent role, albeit clusters also represent a key element in the European Metropolitan Region concept (Litzel and Möller, 2009). Even in the early 1940s when the metropolitan concept was first conceived and the changes on the fringe of cities have come under the increasing attention of spatial disciplines both in the US and in Western Europe, it was seen as an economic unit where a cluster of activities in a core location with different functions sustain the population of a surrounding hinterland which was economically and socially integrated with the core area (Frey and Zimmer, 2001). In order to face the challenges of structural change, to support the regional labour market and to strengthen existing potentials – even in a global way – more and more metropolitan regions have implemented the cluster concepts.

The postcolonial concepts based on difference and otherness, tackling the ways on how peripheries are constructed by the core has long been discussed not only on a supranational level but also in a European context which makes it possible to examine them at regional or national level (Lang, 2012). First, the internal colonialism school brought in the relationship between economic development and regional identities; moreover Lafont (1967) introduced the notion of a colonial relationship between centre and periphery. In his view the relationship is based on exploitation. Hechter (1975) argues that the relationship between core and periphery within a state works exactly the same way, in the sense that peripheries are usually dominated by the metropolitan economy, introducing the concept of "internal others" as the differences appear not between but within nation states.

The discourse about metropolitan regions has had several forerunners identifying big cities as nodes of globalisation, such as Friedmann's World-City Hypothesis (Friedmann, 1986) or Sassen's work on the Global City (Sassen, 1991). They have identified cities as the emerging spatial scale, replacing countries as central nodes in a globalising economy. Both emphasise cities and global city networks as a major driving force behind the new spatial organisation and the international division of labour. This position has been further adopted by the Globalisation and World Cities Research Network monitoring the relation between cities (Beaverstock, Smith, Taylor 1999). And in 2002, Friedmann concludes that "almost the whole world will coexist in a single global urban network, driven by worldwide competition" (Friedmann, 2002, page XV). Most authors in the context of the global cities debate mainly reflect on their ability to concentrate control functions (as main location for transnational corporations) or on the development of services needed to execute these functions (Derudder, 2006). In scientific as well as in political discourse, there has been a clear link between globalisation and urban politics ever since (Newman and Thornley, 2005).

A widespread empirical definition was elaborated in the framework of the European Spatial Planning Observatory Network (ESPON). The project titled “The role, specific situation and potentials of urban areas as nodes in a polycentric development” defined under the headline “Enabling cities to act on the European and global scenes” 76 metropolitan growth areas based on population and GDP, competitiveness, connectivity and knowledge basis (ESPON, 2006, page 115). Since then, the so-called MEGAs have become a standard element in European wide monitoring of spatial development (e.g. in the progress reports on economic, social and territorial cohesion).

After countries such as France and the Netherlands have been early promoters of the metropolitan regions concept, the European debate was heavily influenced by the German approach to support the emergence of European Metropolitan Regions with specific metropolitan functions in Germany (Ritter, 1997; Blotevogel, 1998). According to Rose (2005), metropolitan regions are not a new concept, but they are new in the sense of size and form, and in terms of importance in the global economy. As a result of the changes in the structure of metropolitan areas and the growing importance of metropolitan economies in the global system, the concept of the metropolitan region has also received a new meaning.

4. DEALING WITH METROPOLITAN REGIONS AS A NEW CONCEPT FOR SPATIAL PLANNING. EVIDENCE FROM THE CEE COUNTRIES

Beginning with the new century a new concept of regional planning has established itself in Europe, being strongly related to long-term development, especially in post-industrial countries. Although the conceptual debate about such regions started relatively late, it has gained an important role in spatial planning and research. The main processes which have brought about the necessity for a new spatial planning concept were (according to Blotevogel, 2001): the structural change in the economy, the change towards a flexible network economy, the process of globalization and also the decreasing significance of the nation states. In fact the traditional form of governance in a nation state seems to be less able to cope with the new global economic and political challenges. The need for a development towards a complex political multi-level system (supranational, nation states and local-regional) has become indispensable in a globalized world. An international undertaken in Germany, France, The Netherlands and Switzerland has shown that metropolitan regions are an important strategic tool for economic and regional development in all countries (Megerle, 2009). Metropolitan areas greatly differ across Europe in terms of function and size, governance structure, history and specialization therefore a “one size fits all” definition cannot be regarded as the right choice. E.g. in Germany, the polycentric settlement structure emphasizes the role of metropolitan regions, while the French spatial structure centred on Paris has underlined the necessity of secondary centres. In Scandinavia, due to the sparsely populated regions, much attention is given to stabilizing small and medium-sized towns (Göddecke *et al.*, 2011). This different settlement structure also had an impact on individual organization and governance concepts.

But why has the debate on metropolitan regions in Europe received such a noticeable character in the last two decades? Most political discourses emphasize the strengthening role and the power of such large areas not only in intra-European- but also on an intercontinental level in order to achieve further economic development. Another important aspect would be to reduce the existing interregional differences and to capitalize on the polycentric functions of regions. Despite these efforts in most of the European countries regional disparities still exist and are still very obvious.

The increasing role of metropolitan regions, the dominance of urban centers – which in many cases have contributed to a deepening marginalization/polarization process – have become the most important topics in the spatial planning policy discourses in most CEE countries. This is mainly due to the fact that parallel to increasing competition, networks of cities coupled with uneven development and polarisation have created new winners and losers, both in terms of social and spatial issues. In Poland for example more than 30 years ago, but especially starting from 1998, studies related to spatial planning and development have dedicated much attention to metropolises related issues (metropolitan reform) although with no or insignificant effects in terms of raising awareness among policy makers. According with several authors, restructuring processes in Poland suggest that metropolitan areas are developing way faster than the provinces they are situated in, the most eloquent examples being Krakow, Warsaw or Poznan (Ehrlich *et al.*, 2010). The neglect of small towns in development policies can also be observed within the Polish National Development Strategy 2007-2013 which does not refer to the role of small and medium sized towns whatsoever. Only the National Cohesion Strategy for 2007-2013 specifies the relevance of small towns as potential regional growth poles. What's more, at present there is a lack of an integrated national urban policy or formal legislation for metropolitan areas. The only form of integrated planning in metropolitan areas could be provided by some "bottom-up" initiatives based on the cooperation of local governments or administration.

This is also the case with large metropolitan areas in the Czech Republic, such as Prague, Brno and Plzen which have witnessed faster growth as a result of their diversified economic structure, highly skilled workforce and more developed infrastructure. Prague in particular has set itself apart from the rest of the country resulting in the over-concentration of the population and economic activities (Illner, 2001).

Similar trends can be observed in Hungary, where the centrality of Budapest has increased following the implementation of the Regional Development Plans of the last years, leading to a strong aggregation of economic, political and demographic resources within the capital city.

Another Visegrad country, Slovakia has also witnessed a transformation process favouring large urban centres, especially the capital city. In the last ten years Bratislava has shown a much faster development pace than the rest of the country (Davoudi, 2006). This process could also be observed in the case of Kosice, as the capital city of Eastern Slovakia, which has slowly become the focus of population and economic concentration (Pasiak *et al.*, 2001).

Similar trends could also be observed in Romania, where – in order to decrease the polarization of urban areas – decision makers have first based their actions on "growth pole" theories, hoping that the development of certain regions could be increased by concentrating resources on selected "centres" which – through the effects of radiation and attraction - would trigger the development of the whole area. The statute of member in

the growth poles' group represented a special stake for all the big cities from the country, because it facilitates the access to approximately one billion of euro's, money especially granted through the ROP, funded by the EU until 2013. Another positive characteristic of the growth pole policies is that funding is given much easier to cities which form metropolitan areas and elaborate integrated urban development plans. Law no. 351 of July 6th, 2001 on the National Territorial Management Plan, Section IV-Settlements, defines the metropolitan area as the area established in partnership through the voluntary association of the main urban centres and the adjoining urban and rural settlements up to a 30 km distance which would cooperate at different levels. The legislation also indicates the functioning of these metropolitan areas, stating that: "Metropolitan areas work as independent entities without legal personality". According to this definition, besides Bucharest, other cities tried to develop metropolitan areas in Romania. So far, empirical analyses have shown that these approaches have only lead to increasing disparities between the urban areas and their neighbouring areas, at least as far as social and economic indicators are concerned.

A new approach to the urban development system in Romania is currently being elaborated by the Ministry of Regional Development and Public Administration. In consequence, if for the 2007 – 2013 programming period the ROP has allocated funds for 3 main types of urban areas (growth poles, urban development poles and other types of urban areas), now we can talk about 8 types of towns and cities included in two main categories:

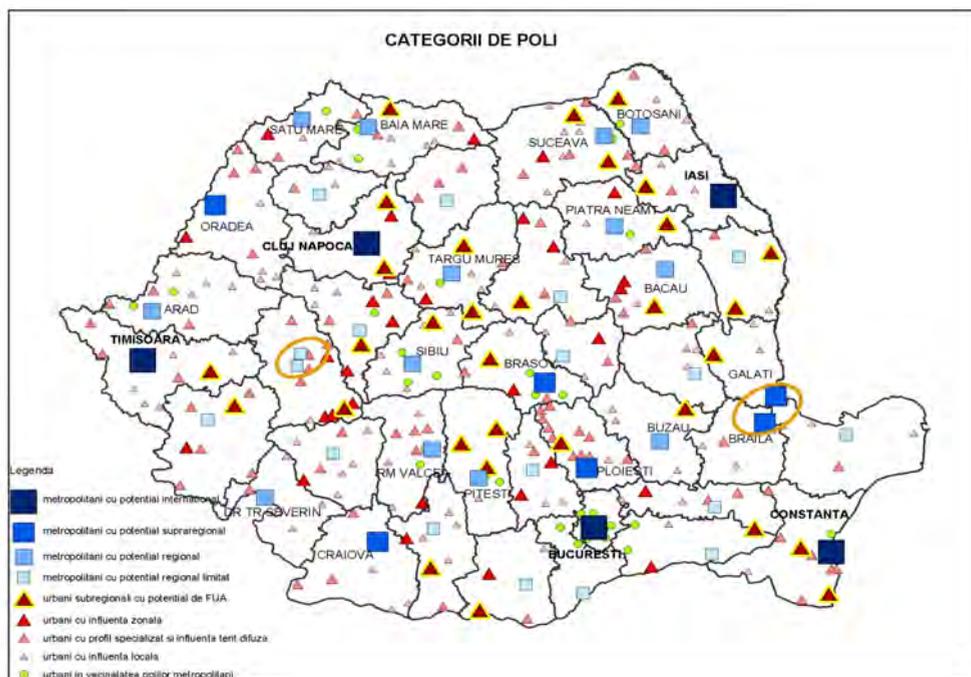


Fig. 1. The network of urban poles proposed for the 2014-2020 programming period.

Source: The Romanian Ministry for Regional Development and Public Administration (2012)

I. Metropolitan Poles divided in 4 categories:

- with international potential: Bucharest, Timișoara, Cluj-Napoca, Iași, Constanța;
- with supra-regional or inter-regional potential: Brașov, Craiova, Galați-Brăila (urban system), Oradea, Ploiești;
- with regional potential: Bacău, Arad, Sibiu, Târgu Mures, Baia Mare, Satu-Mare, Suceava, Drobeta Turnu Severin, Pitești, Buzău, Botoșani, Râmnicu Vâlcea, Piatra Neamț;
- with limited regional potential: Resița, Târgu Jiu, Slatina, Alexandria, Târgoviște, Giurgiu, Slobozia, Călărași, Tulcea, Focșani, Vaslui, Deva-Hunedoara, Alba Iulia, Zalău, Bistrița, Miercurea Ciuc, Sfântu Gheorghe.

II. Urban poles/centers (a total number of 243) – generally towns with less than 50.000 inhabitants.

All these examples illustrate that the most important challenge in CEE countries' strategic spatial planning is to achieve a more balanced territorial development within the country. Lessons can also be learned from cohesion countries which have experienced different spatial development trends. In Spain, for example, structural aids have managed to counterbalance the polarization effects with the help of a more balanced distribution of economic activities across the country. Among the new Member States, Slovenia has also become a good example in this sense. The elaboration of the National Spatial Strategy shows a positive step for implementing a polycentric settlement structure based on eight regional development centres, trying to avoid the over-concentration of economic activities in just a few major urban areas.

5. CONCLUSION

As a conclusion it must be stated that most political discourses emphasized the increasing role and power of such large urban agglomerations not only on European- but also on an intercontinental level. Metropolitan regions also help to achieve a balanced economic development through their increasing ability to reduce the existing inter-regional differences and to capitalize on their polycentric functions. On the other hand, up until now there has been very little empirical proof of spill-over effects resulting from metropolitan regions acting as engines of growth, what's more, regional disparities are still very much present in these areas.

Further on, there is a problem related to the effects of metropolitan development on adjacent areas, thus the reluctance on behalf of the areas outside of the delimited metropolitan areas, fearing the fact that the aggressive promotion of the metropolitan regions concept could lead to the decreasing importance and the weakening economic power of the surrounding rural areas. Potential outcomes are many, but the main question remains: do they gain significance by participating in those metropolitan regions or do they lose their specific character and endogenous development potential?

This is why further investigation and deeper research about the implementation and success of the concept is absolutely necessary in order to show its long-term effects on the regions outside the metropolitan catchments areas and to decide whether this new policy instrument could be considered as a new spatial planning concept or a paradigm shift.

ACKNOWLEDGEMENT

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WEATHERING PROCESSES AND THEIR EFFECTS ON STONE-BUILT CULTURAL HERITAGE. CASE STUDY: "SAINT ARCHANGELS" CHURCH, DEAG VILLAGE

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ABSTRACT. – **Weathering Processes and Their Effects on Stone-Built Cultural Heritage. Case Study: "Saint Archangels" Church, Deag Village.** Rural churches are an essential part of the Romanian cultural and historic heritage. Unfortunately their preservation is endangered by a number of factors, both natural (weathering) and anthropogenic (human neglect). Due to the complex nature of the conservation and restoration treatments, an interdisciplinary approach is therefore required. This study focuses on the damage diagnosis methodology applied on the lithic component of the "Holy Archangels Michael and Gabriel" Church in Deag village. The methodology consists of a series of investigations carried out both *in situ* (macroscopic analysis) and in the laboratory (microscopic analysis) which will provide reliable data concerning the weathering processes and their effects. The results will serve in the future elaboration and implementation of conservation and restoration treatments.

Keywords: *cultural heritage, weathering, lithic component, damage diagnosis, investigations*

1. INTRODUCTION

The preservation of our cultural heritage is constantly endangered by the inevitable action of weathering processes. Although stone is one of the most durable building materials, in the course of time, it can be severely damaged by physical, chemical or biological weathering forms. Accurate damage diagnosis is required in order to ensure the monument's structural and aesthetic integrity. This can be accomplished by correctly identifying both the causes (weathering processes) and the effects (weathering forms or deteriorations).

2. MATERIALS AND METHODS

The methods chosen to carry out this study rely on *in situ* and laboratory investigations. The *in situ* investigation process involves the following three steps: identification of the lithotypes, identification and diagnosis of the weathering forms and sampling. A series of laboratory investigations are also performed on the collected samples.

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3. RESULTS AND DISCUSSIONS

The identification of lithotypes is based on macroscopic analysis. More detailed information concerning physical, chemical and mechanical properties can be obtained in the laboratory through microscopic analysis.

Identification and diagnosis of the weathering forms. The weathering forms are identified with the help of ICOMOS-ISCS “*Illustrated glossary on stone deterioration patterns*” and mapped according to their type, intensity and distribution using the mapping method developed by the Working Group “Natural stones and Weathering” from the Aachen University of Technology.

In situ sampling is necessary for further, more detailed laboratory analysis. The samples are collected from deteriorated stones, located in problematic areas, such as those in close contact with the ground or those exposed to weathering factors. Fresh rock samples are also collected from the original building rocks for comparative analysis.

The laboratory analyses of the samples can reveal detailed and accurate information about the damages that are not visible to the naked eye. It can also confirm or contradict the suppositions and theories formed during the *in situ* investigations (macroscopic investigations). *Optical microscopy and electron microscopy (SEM) analysis* offers detailed information about the visible and non-visible deteriorations, it can determine physical and mechanical properties of the material and its mineralogical structure. *The x-ray diffraction (XRD) method* is employed in order to determine the mineralogical composition as well as to identify new minerals, which have formed as a result of chemical weathering (e.g. salts).

Before carrying out the investigations, a profile of the monument must be made. This is usually done by acquiring information regarding monument identification, location, building techniques and materials, cultural importance, previous interventions and climatic conditions.

3.1. Case study: “Holy Archangels Michael and Gabriel Church”, Deag Village



Fig. 1. “Holy Archangels Michael and Gabriel Church”, South - East view.

3.1.1. Monument profile

The “Holy Archangels Michael and Gabriel” Church was built in the 18th century, in 1765. It is located in Deag, a small village situated in the Târnavé Hills, in Mureş County, 8 km away from its administrative town, Iernut.

The church was built, according to tradition, on a promontory. The walls were built with wooden beams arranged according to the blockbau system. The foundation is built with irregular blocks of stone, extracted from the nearby hills.

The study focuses on the damage diagnosis of the monument’s lithic component, the foundation. The stone-built foundation has suffered numerous degradations over time, caused by both environmental and human factors. In 2011 the foundation was damaged due to some superficial landslides. Consolidation works have been employed to strengthen the southern and eastern part of the foundation. The original eighteenth century stone was replaced by concrete slabs, an inadequate choice from an aesthetic and structural point of view.

The climatic conditions that characterise the Târnavé Hills favour the action of all weathering processes. The most probable to occur are the following types: frost weathering, wetting and drying weathering, salt crystallization weathering, chemical and biological weathering. Frost weathering (freeze – thaw) is justified by the negative temperatures recorded during winter, especially in January when the average temperature is -4°C and also by the sudden temperature fluctuations between positive and negative recorded in the seasons of transition (October, month of the first thaw and April, month of the last thaw). The mechanical weathering through wetting and drying can occur during the warm season, when summer rains are followed by periods of intense evaporation. The wetting and drying process is often accompanied by the salt crystallization process, thus causing more severe deterioration. The chemical and biological weathering are sustained by an average relative humidity of 76%-80% and by the high temperatures recorded in the summer season.

3.2. In situ investigations

3.2.1. Identification of lithotypes

Based on the macroscopic analysis and the acid chloride test, it has been found that the lithic material is carbonate cemented sandstone. This type of sedimentary rock is susceptible to weathering because of its high porosity and bedding planes that allow water to infiltrate (Tufescu, 1966).

3.2.2. Identification and diagnosis of the weathering forms

Delamination is predominant on the southern and northern parts of the foundation. The rocks with southern exposure are few in number but are severely affected (fig. 2). Some of the bedding planes completely detached and fell to the ground. The loss of lithic material has left a number of holes into the foundation (fig. 3). According to Torracca (2009), delamination is caused by the repeated action of freeze – thaw cycles (frost weathering). Aroldi (2005) attributes it to both frost weathering and termoclasty. The latter can be justified only in the case of the rocks that are situated on the southern side of the foundation which are exposed to direct solar radiation.



Fig. 2. Severe delamination along the bedding planes.



Fig. 3. Partial disintegration caused by severe delamination.

Some of the rocks located on the northern side of the foundation have been affected by both delamination and *granular disintegration*. The association of these two weathering forms has created a sculptural and sandy surface (fig. 4). White *efflorescence stains* have been noticed on a small number of rocks located at the lower part of the foundation. They are the result of the dissolution of the calcium carbonate and may indicate a more severe deterioration beneath the surface (fig. 5). Oxidation has affected a large number of rocks, on all sides of the foundation, causing chromatic modification but did not involve any visible surface deterioration.



Fig. 4. Delamination and granular disintegration.



Fig. 5. White efflorescence caused by the dissolution of calcium carbonate.

A form of biological weathering, algal colonisation, has been identified on the western side of the foundation but its extent is limited to two stones that are in direct contact with the ground. A further microscopic analysis will reveal more accurate information about the extent of the biological weathering.

The *in situ* macroscopic investigation was finalised with the mapping of the weathering forms, a method intended for monitoring their evolution (fig. 6 and 7). The middle section of the northern side was chosen for this purpose because it includes all identified weathering forms.

WEATHERING PROCESSES AND THEIR EFFECTS ON STONE-BUILT CULTURAL HERITAGE
CASE STUDY: SAINT ARCHANGELS CHURCH, DEAG VILLAGE

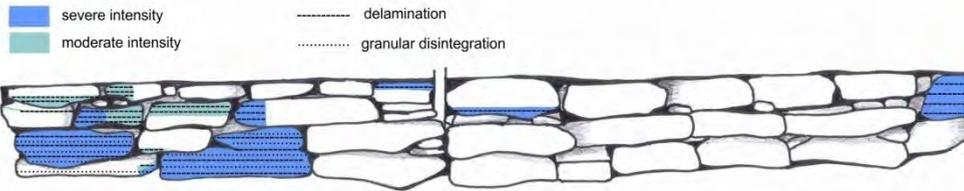


Fig. 6. Physical weathering forms.

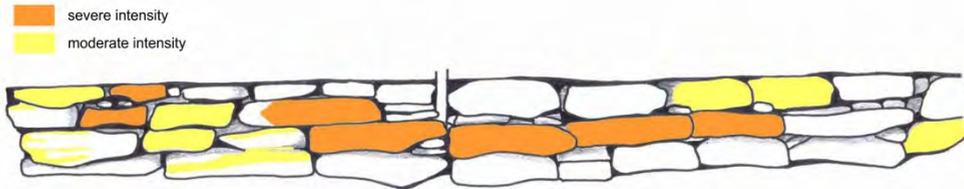


Fig. 7. Chromatic alteration caused oxidation.

3.2.3. Sampling

The samples were collected from the southern and northern sides of the foundation, from severely damaged rocks, that allowed easy detachment of the lithic material. Fresh rock samples were also taken from the source area which is located in close proximity to the monument. This area was once used by the local population to extract building materials but, in the 20th century, it was repurposed for agricultural needs. The samples were collected from a stone block that was taken out of the ground during ploughing.

3.3. Laboratory investigations. Optical microscopy

3.3.1. Petrography analysis

Thin sections of the samples were analysed using a Zeiss Axiolab Microscope. The following structural components were identified: mica, feldspar, quartz and bioclast fragments, cemented together with calcium carbonate (fig. 8 and 9).



Fig. 8. Microscope analysis in plane – polarized light. Fig. 9. Microscope analysis in crossed – polarized light. Both photos show: mica, quartz and bioclast fragments.

3.3.2. Weathering forms

The microscope analysis of the samples has identified the presence of secondary gypsum crystals (*subefflorescence*) (fig. 10 and 11). The pressure exerted by the newly formed crystals is rather dangerous as it may cause structural damage by breaking down the walls of the pores. The *dissolution of calcium carbonate* has left empty spaces between the particles (dissolution pores), thus weakening the sandstone's mechanical resistance and facilitating further weathering (fig. 10 and 11). The lack of cement is one of the causes of granular disintegration. *Oxidation* was caused by both chemical and biological weathering. Microscope images show the presence of iron bacteria (fig. 12 and 13).

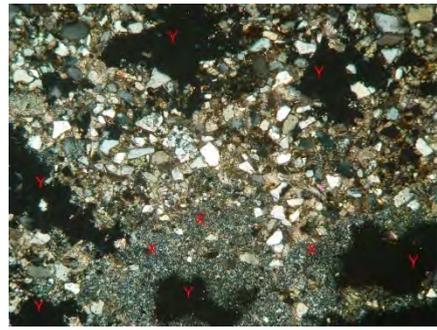
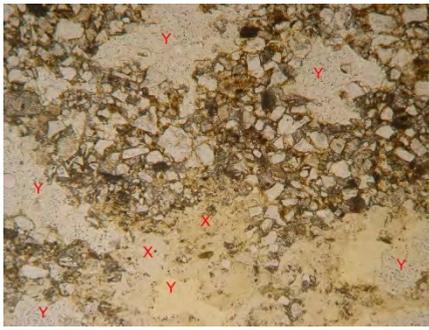


Fig. 10. Microscope analysis in plane - polarized light. **Fig. 11.** Microscope analysis in crossed - polarized light. Both photos show: X - gypsum crystals; Y - dissolution pores.

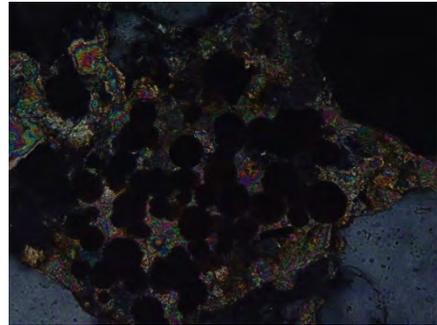
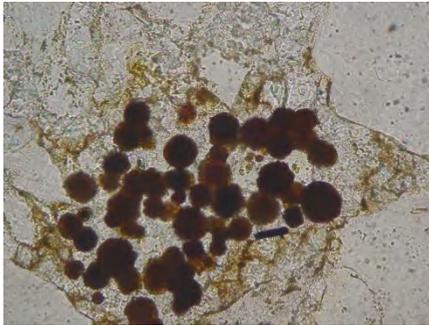


Fig. 12. Microscope analysis in plane - polarized light. **Fig. 13.** Microscope analysis in crossed - polarized light. Both photos show iron bacteria.

4. CONCLUSIONS

The preliminary results show that the lithic material has been damaged by all three weathering processes (physical, chemical and biological ones). The complexity of the weathering forms calls for further laboratory investigations such as scanning electron microscopy (SEM) and X-ray diffraction (XRD). The study is part of a wider

research project that seeks to provide reliable damage diagnosis for the elaboration and implementation of conservation and restoration treatments for the “Holy Archangels Michael and Gabriel” Church. The methodology can also be applied to other similar stone-based monuments.

ACKNOWLEDGEMENTS

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THE ROLE OF THE RELIEF IN THE DEVELOPMENT OF HUMAN SETTLEMENTS IN HUȘI DEPRESSION

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ABSTRACT. – The Role of the Relief in the Development of Human Settlements in Huși Depression. Human settlements are closely related to the regional physical-geographical framework determined by the geological, geomorphological, hydrological and climatic features that condition the location and evolution of the settlements system. Among the morphometric parameters that characterize local conditions, slopes and altitudes play an important role in the spatial extent of settlements. Slope determines the access, the extension of built space and the drainage inside the area of settlements. An excessively flat land is not able to drain rainwater. The optimum gradient is 1-2^o, a value that generally characterizes terraces, plateaus and sculptural interfluves or accumulation glacises. Slopes over 5^o raise problems in the construction of buildings and access roads, especially on territories with an excessive fragmentation. The altitudinal gradient is also important in the spatial development of settlements, as it implies a significant contrast between the localities situated in the eastern lower part of Depression and those located on the higher western and northern sides. To analyze the spatial evolution of human settlements in the Huși Depression in relation to slope and altitude were used various editions of cartographic materials covering a period of about 80 years (1920-2010), the years 1950 and 2010 being conventionally selected as reference.

Keywords: *Huși Depression, relief, slope, altitude, settlements.*

1. INTRODUCTION

The specific natural conditions of Huși Depression, together with certain social-economic and historical aspects that characterized this region during the recent period, provided a favorable environment for the development of human communities, so that most of the currently existing settlements are documented even from the 14th-15th centuries. Over the time, the succession of several political regimes led to profound legislative changes that had important effects on land utilization and the expansion of settlements. The spatial evolution of the settlements in Huși Depression experienced the most important transformations during the last century, many of the villages now doubling their surface.

Studies regarding the relief of Huși Depression can be found in a small number of papers with local coverage, the majority addressing larger areas such as the Moldavian Plateau. Gugiuman (1932, 1938a, 1938b, 1942) conducted a series of studies which

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specifically address the problem of slope processes in Huși Depression and Bârlad Basin. Among the geomorphological studies with larger extension, which also include the study area, may be mentioned those of Hârjoabă (1962, 1965) and Hârjoabă & Poghirc (1968). One of the most important studies is the monograph of Vaslui County of Gugiuman et al. (1973). Other studies that focused on larger areas, but also make references to Huși Depression, are those of Paraschiv (1964) and Obreja (1958, 1968) in a series of papers that deal with the problem of valleys and terraces, and that of Rădoane et al. (1990) regarding sediment budgets and gully erosion in the Bârlad basin.

Important contributions to the study of settlements and population of Moldova and implicitly the Depression of Huși have also been brought by geographical studies regarding the development patterns of the built-in urban settlements or the identification of urban influence areas and urban hierarchies (Ungureanu, 1980), theoretical concerns regarding rural and urban settlements (Șandru, 1978) or the hierarchy of rural settlements (Nimigeanu, 1985; Chiriac, 1978). Other studies are those of Băican (1997) that presents the evolution of the Moldavian territory using maps and census materials from the 18th century, or those of Ungureanu (1968, 1985), who captures the evolution of the Romanian population since 1860. Muntele (1998) addressed the issue of reconstructing the population dimension at different moments in the Moldavian history. Among the latest studies are the synthesis of human geography regarding the population, labor and human settlements in transition from Moldova (Ungureanu et al., 2003) and that of Țurcănașu (2006) about the evolution and current status of the Moldavian settlement system.

2. STUDY AREA

The Depression of Huși is a distinct geographic unit, located in the south-eastern part of the Central Moldavian Plateau, in the subunit of Bârlad Plateau (fig. 1). The Depression is situated on the river Prut, being delineated on the north by Pietrăriei Cuesta, developed on the right side of Moșna River, which continues eastward with Cîlcea Hill. To the west it is limited by the summit of Lohan Hill, south of Drăslăvăț Cuesta, continued eastwards with the right side of the Voloșeni brook up to Prut River, which forms the eastern boundary of the basin, between Cîlcea Hill (north) and Săratu village (south).

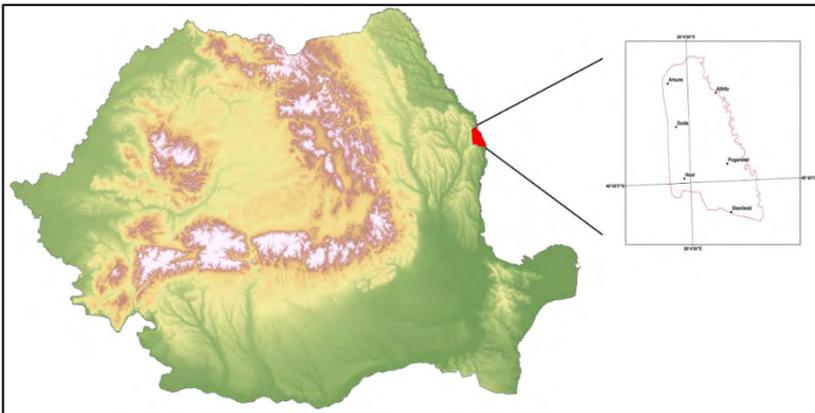


Fig. 1. Location of the Huși Depression in Romania.

Between these limits the depression has an area of approximately 300 km² and it includes the town of Huși and 18 other villages belonging to several communal territories: Arsura, Duda-Epureni, Stănileşti and Drânceni.

As a controlling factor in the formation and evolution of the landscape, the geology of the depression is of main importance due to the reduced resistance to erosion of the predominantly loamy deposits. These allowed for a fast denudation of the area, leaving as dominant some structural plateaus developed on oolithic limestone. The monocline position of the geological deposits prompted the formation of some subsequent asymmetric valleys.

The mean annual temperature is 9.4°C. The monthly minimum average is in January (-3.2°C) and the maximum average in July (20.5°C). Mean annual rainfall is low (525 mm) and has a torrential regime especially in summer, which is also reflected in the river flow regime.

The overall aspect of the relief of Huși Depression is of an amphitheater opening to the SE. The western part of the depression is higher, the hills here frequently exceeding the altitude of 300 m. The central part of the basin presents a hilly relief, which decrease in altitude towards Prut River. On the right side of the valley there are some fairly well preserved terrace levels.

3. MATERIALS AND METHODS

In the analysis of the distribution of settlements in relation to altitude and slope we have used cartographic materials covering two time periods: 1920-1960 (for which topographic master plans scale 1:20000 were used) and 2005-2012 (for which orthophotos and recent topographical plans scaled 1:5000 were used). Tables and diagrams obtained from this analysis have used conventionally the year 1950 for the first time span and 2010 for the second.

Slopes and altitudes were determined automatically through a process based on the SRTM (Shuttle Radar Topographic Mission) digital elevation model, resampled to a pixel size of 30 m. Slopes were classified into six classes, and elevations into seven classes. Subsequently, using the *Zonal Histogram* module implemented in ArcGIS 10.1, the spatial development of settlements on the depression slope and elevation classes was analyzed for a period covering approximately 70-80 years.

4. RESULTS AND DISCUSSION

The average slope of the terrain determined for the depression is 3.7°, with a standard deviation of 3.3°, and hence most of the values are between 1 and 7°. The almost horizontal slopes (<1°) and the slowly inclined ones (1-2°) have a significant share (27.09% and 12.39%) and are specific to the Prut flood plain and terraces as well as to the plateaus or interfluvial summits. The slopes of 2-5°, with a frequency of 31.99%, are generally specific to the slopes conforming to the general monocline structure. They are followed as frequency by the 5-8° slopes, characteristic for the sides of the symmetric valleys and for the connection areas between slopes and interfluvial surfaces. The 8-11° declivities characterize 8.19% of the area, while those

of 11-15° are specific for the heavily degraded slopes, especially those of the cuesta type, landslide escarpments and gully banks. Compared to the distribution of slope classes throughout the depression, it appears that current settlements are developed mainly on the declivity classes of 1-5° and 5-10°, which have the largest share (table 1).

The comparative analysis of the distribution of the built-up areas within the Huși Depression according to slope classes is shown in table 2 (for 1950) and table 3 (for 2010).

Table 1.

Settlement distribution according to the slope

Location	Surface (ha)	Slope (degrees)		
		Minimum	Maximum	Medium
Ghermănești	169.11	0.11	13.68	5.29
Arsura	85.5	0.41	10.78	5.68
Răsești	118.62	0.02	6.14	1.26
Drânceni	33.66	0.11	10.79	3.79
Albița	7.65	0.07	4.79	1.22
M. Kogălniceanu	23.58	0.33	10.9	5.59
Fundătura	60.21	1.77	16.97	7.25
Pâhnești	66.69	0.58	10.04	5.43
Duda	157.95	0.22	22.1	5.71
Epureni	101.16	0.96	10.37	6.24
Valea Grecului	82.62	0.02	16.77	4.76
Chersăcosu	30.69	2.67	11.9	6.3
HUȘI	623.88	0.04	13.23	3.61
Stănilești	160.47	0.02	14.3	3.73
Pogănești	62.82	1.28	12.68	5.34

Table 2.

The distribution of the built area (ha) on slope classes (°) in 1950

Slope (°)	HUȘI	Arsura	Duda	Epureni	Stănilești	Drânceni
0-1	24.84	0	0.63	0.09	0.54	0.99
1-2	80.91	0.36	2.25	3.06	2.52	0.63
2-5	176.31	11.16	25.65	15.21	24.57	3.42
5-8	65.16	17.19	52.47	33.57	5.13	5.49
8-11	6.75	1.71	8.01	11.97	0	3.24
>11	1.08	0	0	0	0	0
	355.05	30.42	89.01	63.9	32.76	13.77

Table 3.

The distribution of the built area (ha) on slope classes (°) in 2010

Slope (°)	HUȘI	Arsura	Duda	Epureni	Stăniliești	Drânceni
0-1	31.59	0.09	1.35	0.09	29.16	3.78
1-2	95.58	0.72	6.75	3.24	21.51	6.39
2-5	363.33	30.06	51.93	20.07	65.43	13.95
5-8	116.91	47.16	76.14	58.41	33.3	6.03
8-11	15.3	7.47	17.37	19.35	8.28	3.51
>11	1.17	0	4.41	0	2.79	0
	623.88	85.5	157.95	101.16	160.47	33.66

In the case of Huși City it is noted that the largest expansion of built-up areas from 1950 to the present took place on terrains with slopes between 2 and 5°, of importance also being the slopes between 5 and 8°.

The localities Duda, Epureni and Arsura, being located under Lohan Cuesta, at the source area of some valleys, had an extension conditioned by this type of relief, so that the built-up areas have advanced on terrains with a greater slope, generally in the range of 5-8°.

Drânceni village, located on the 20-30 m terrace of Prut, expanded its territory especially along that terrace to the NW and SE, on slopes of 1-2°.

Located at the contact between the right side of the Prut valley and its plain, Stăniliești extended in both directions, both on the floodplain (about 50 ha) and on the slopes (about 40 ha on gentle slopes of 2-5° and about 30 ha on steep slopes of 5-8°).

The location of Râșești underwent a resembling spatial evolution to that of Drânceni due to its location on similar relief conditions (terrace). Pogănești expanded predominantly on the right side of the Prut valley, avoiding the floodplain affected by moisture excess.

The villages Valea Greului and Chersăcosu, being more recent (they do not appear on the topographical plans prior to the year 1950) were not included in this analysis.

Another aspect must be mentioned in relation to the terrain slopes, namely the problem of landslides as present geomorphological process with negative impact on the development of settlements. Thus, on the strongly inclined slopes, landslides often occur, representing one of the most unfavorable geomorphologic risks affecting rural settlements. Heavily influenced from this point of view is Huși City, where the deluvial slopes represent about 30% of the built-up area (Ungureanu, 1980). In the case of landslides, local conditions of relief are often inter-related with the geological and hydrographic conditions. Figure 2 presents the development of built areas in relation to declivities for Huși City and the most important villages, i.e. those which function as commune seat.

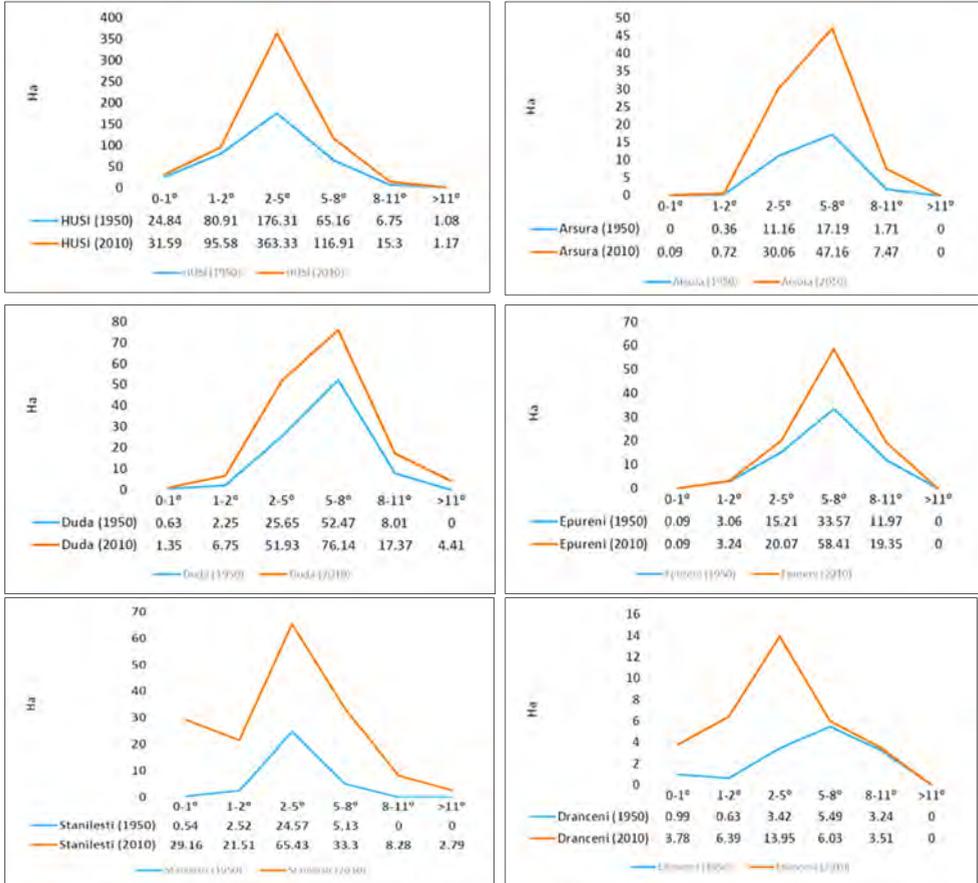


Fig. 2. The evolution of the built-up areas on slope classes (1950-2010).

The second morphometric parameter analyzed in this paper in relation to the spatial development of settlements is altitude. Muntele (1998) assigns the altitudinal gradient an important role in the structuring of settlements. In the author's opinion, the altitudinal gradient is manifested with different intensities from one region to another in historical Moldova. In the space between Prut and Siret rivers, the altitudinal gradient manifests in two-way, from some favored areas such as contact depressions to the open steppe fields or the higher wooded areas. In the virtue of historical inertia and although not that obvious, these contrasts remain until today.

In terms of altitude, the Depression of Huși has the form of an amphitheater, with altitudes decreasing from west and north (over 300 m) to south-east (11 m in the Prut valley, on the downstream limit of the basin). To characterize the altitude of the relief, we used the hypsometric map with an altitude difference among classes of 50 m, which displays the main elevations of the basin.

Analyzing the location of the main settlements in the depression (Huși, Ghermănești, Duda, Arsura) in relation to their position on altitudinal classes, it was found that larger settlements (Huși, Ghermanesti) occupy in a percentage of over 50 % altitudes of 100-150 m. For comparison, Duda developed in a higher percentage (60 %) in the range of 150-200 m, while Arsura is located 77% in the 200-250 m altitude class.

In the case of Huși, a significant weight is held by the altitude class of 50-100 m, which corresponds to the old center of the locality, in this altitudinal span being located the old residential and commercial - industrial city. The proportion of the altitude classes reflects the polynuclear structure of the town, with an old center with a compact appearance and a spatial evolution through the incorporation of neighboring villages. Currently, the built-up area of Huși expanded inclusively in the vineyard area around, to higher altitudes of 150-200 m where there are numerous scattered houses.

Table 4 shows the distribution of build-up area on altitudinal classes in 1950, while table 5 presents the situation of 2010. Figure 3 shows evolutionary aspects for Huși and the commune seats within the depression.

Table 4.

The distribution of the built area (ha) on altitudinal classes (m) in 1950

Altit. (m)	HUȘI	Arsura	Duda	Epureni	Drânceni	Stănilești
0-50	0	0	0	0	13.77	28.62
50-100	209.34	0	0	0	0	4.14
100-150	141.48	0	1.89	34.2	0	0
150-200	4.23	6.48	68.04	29.7	0	0
200-250	0	22.32	18.9	0	0	0
250-300	0	1.62	0.18	0	0	0
300-350	0	0	0	0	0	0
	355.05	30.42	89.01	63.9	13.77	32.76

Table 5.

The distribution of the built area (ha) on altitudinal classes (m) in 2010.

Altit. (m)	HUȘI	Arsura	Duda	Epureni	Drânceni	Stănilești
0-50	0	0	0	0	30.78	149.22
50-100	266.31	0	0	0	2.88	11.25
100-150	328.59	0	39.33	49.32	0	0
150-200	28.98	15.48	94.14	51.84	0	0
200-250	0	60.3	19.8	0	0	0
250-300	0	9.72	4.68	0	0	0
300-350	0	0	0	0	0	0
	623.88	85.5	157.95	101.16	33.66	160.47

In the period under review, it appears that the villages of Drânceni and Stănilești extended up to altitudes of 50-100 m. In the first case, the location of Drânceni on the Prut terrace of 15-30 m (similar to Râsești) allowed the development of the village on this terrace. In the case of Stănilești, the village has spread mainly near the right side

slope of Prut valley and in a lesser extent in the upper third of it. Ghermănești village has expanded eastward at lower altitudes, on the interfluvial ridges bordering the valley of Luncani and descending slightly to the valley of Prut.

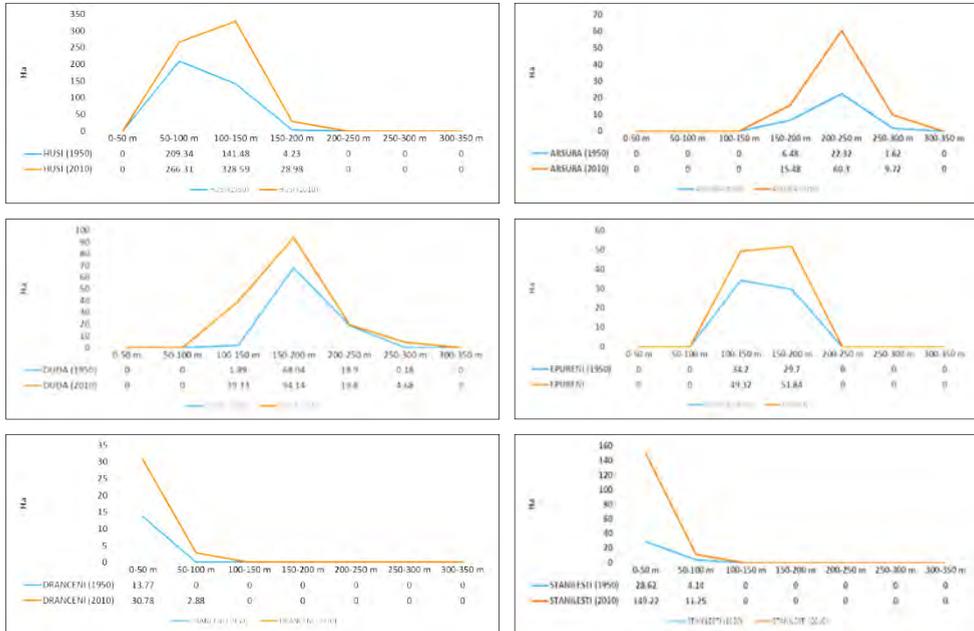


Fig. 3. The distribution of the built area (ha) on altitudinal classes (1950-2010).

It is noted that in the case of Huși the built-up area expanded mainly in the 50-100 m spacing corresponding to the old center of the locality, but significantly advanced to the highest ground, in the vineyard, at altitudes of 150 m and even 200 m.

Epureni and Duda extended more horizontally in the altitude of 150-200 m spacing, the highly fragmented landscape forbidding the expansion of these settlements in altitude.

5. CONCLUSIONS

The specific natural conditions for Huși Depression and certain social-economic and historical features that existed along time in this region provided a favorable environment for the development of human communities, so that most of the currently existing settlements are documented here even from the 14th-15th centuries. Over the time, the succession of several political regimes led to profound legislative changes that had important effects on how land was used and on the way that settlements expanded. The spatial evolution of settlements in the Huși Depression experienced the most important transformations in the last century, many villages having doubled their surface during this period.

The diachronic approach on the development of human communities in the Depression of Huși reveals the spatial development of settlements and how the land was used during the 20th century. It appears that in the case of Huși and other localities situated on the western side of the depression, within hollow type slip basins located at the heads of valleys, the extension of the built-up areas, although conditioned by this rather improper relief, took place on higher slopes (5-8°) and at a higher altitudes compared to the original situation. In the case of Huși, the location has expanded mainly in the 50-100 m spacing corresponding to the old hearth of the city, but significantly advanced in the higher area, in the vineyard, at an altitude of 150m and even 200m.

The villages located in the central part of the depression or those on the terraces and on the Prut valley are characterized by land expansion conditions with an optimal gradient (1-2°), specific to terraces, sculptural interfluves or accumulation glacises.

The overall conclusion is that through its specific characteristics, the relief is a key factor, sometimes limiting for the location of human settlements. The geomorphological specificity of the Huși Depression consists of an alternation of land propitious for settlements development, such as interfluvial plateaus and ridges or terraces and high levees, with less favorable ones of the cuestas affected by slope processes or excessively humid floodplains, conditions that could not prevent the continuous human presence in this geographical subunit.

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EMIGRATION AND ITS GEODEMOGRAPHIC IMPACT IN SLĂNIC MOLDOVA CITY OF BACĂU COUNTY, ROMANIA

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ABSTRACT. – **Emigration and Its Geodemographic Impact in Slănic Moldova City of Bacău County, Romania.** The article talks about emigration from Slănic Moldova, a city from Bacău county, Romania, and its geodemographic impact, using statistical data from Population Censuses, National Statistics Institute and the own survey conducted in January-April 2015. The study starts with an analysis concerning the amplitude of emigration, in the second part, trying to highlight its importance in the numerical evolution of the population from Slănic Moldova. The third part brings forward the problem of emigration by age and gender, which give a clear view over the situation present in the city mentioned. Using eloquent data, the study show up the demographic changes trying to see to what extent emigration had a contribution to it. To reduce the syncope of a descriptive analysis, the collected data are outlined through cartographic method in order to show the geographical distribution of emigration in the city.

Keywords: *birth rate, emigration, gender and age structure, impact, population decrease, Slănic Moldova*

1. INTRODUCTION

Analysis of population censuses data, indicate that the population of Slănic Moldova decreased with 798 people in the period from 2002 to 2011, representing a decrease from 4996 to 4198 inhabitants. During this period the city has undergone demographic transformations induced by migration on one side and, on the other side, by the demographic changes of youth practices, and the two are in constant relation, migration having an important influence over population emancipation, that results primarily in a declining of birth rates. Thus, in terms of demographic aspects, Slănic Moldova has registered a continuous involution since 2002, after a continuous increased between 1992 and 2002. The geographical distribution of the inhabitants of the town indicates Cireșoaia as the most populous, with 42% of the population, given that in 2010, according to City Development Strategy (2010), the percent was approximately 38%, in Slănic Moldova was 30% while in Cerdac only 27% of the population.

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Since especially the young population in age group 18-40 years is leaving, the reproductive capacity is decreasing, this being one of the reasons why the birth rate decreased in Slănic Moldova city. Emigration has not only an immediate impact on the population, influencing the city's population continuous decrease, but also a long-term impact, as fertile women leave the city in order to work abroad conducting to a damage of demographic indicators as a result of decreasing birth rate. Naturally, reducing or stopping the demographic decline should be achieved by improving the combined result of three major factors: increasing the birth rate, decreasing mortality and reducing emigration.

2. LITERATURE REVIEW

The impact of migration can be defined as the effect caused by the movement of people between two places, from the origin place to a destination place. The literature treats usually these population movements as an adjustment force in the receiving region. In modern times, labor migration occurs invariably from underdeveloped or developing regions to regions that have an attractive economic development. The impact of labor migration can vary from country to country, depending on the volume, composition and characteristics of migration flows and on the demographic and economic conditions in countries of reference and in the reception. With respect to these issues, there are several comparative studies on migration in Commonwealth of Independent States (Tishkov et al., 2005; Ivakhnyuk, 2006, Mansoor and Quillin, 2006, 2008; Abazov, 2009).

In Romania there are studies that put population decline after 1989 on account of negative net external migration, which is stronger than natural balance of population, and on the rising death rate that exceeds the birth rate (Andria et al., 2010; CNPD, 2006; CNPV, 2009 and 2012; Ghețău, 2004 and 2007; Grant et al., 2004; Kupiszewski, 1997; MMFES, 2007; Roman, 2011; Roman and Voicu, 2010). Salt (2008) conducted a classification of countries according to the importance of migration and the natural balance in the growth or decline of a country population and included Romania - along with other countries such as Poland, Moldova, Ukraine, etc. - in the countries that bear a significant decline in population from both natural causes and due to net migration. Tofan (2014:155) mention in his research about the geo-demographic decline of Mureș defile stating that the decrease of population was "especially due to low birth rates and high mortality rates, plus outmigration".

During post-communism, the Romanian society faced demographic, economic, social and cultural changes, mutations that occurred in both rural and urban areas and left marks on the functionality of the environment. The small towns in Romania, states Petrea et al. (2013:121), are facing serious and generalized issues, represented firstly by the economic restructuring, followed by demographic decline, labor migration and, ultimately by reduced urban functions.

After the fall of Ceaușescu, Romanian emigration was estimated by Mureșan (1996: 832) as having a value of 156,000 people in 1990-1993, while during the 2002 census there were registered about 361,310 people temporarily absent (Dimitriu et al., 2013) - of which 149,000 rural people (Ungureanu et al., 2009). Of course the values are far from

being the real ones, values recorded in Romania being quite different from those in destination countries and this because many were illegal, unregistered, unreported. Son and Noja (2012) claimed that in 2007 only in the European Union were 1.6 million Romanian migrants, migrants that represented 7.2% of the population.

3. DATA AND METHODOLOGY

The study can be divided schematically into three steps: a preliminary documentation stage, research on the field, required to obtain relevant data, and a stage concentrated on analyzing, processing and mapping of information obtained.

In pursuit of this study were used data from the following sources:

- National Institute of Statistics;
- Population Census (2002 and 2011);
- Town Hall Slănic Moldova;
- Investigation in the city of Slănic Moldova

The survey in Slănic Moldova was conducted in January-April 2015, comprising 302 persons, meaning 153 emigrants and 149 people who have never emigrated, neither they, neither their life partners. So, questionnaires were applied one per family. If were living in a house several families, each family received one questionnaire. The questionnaire was completed by one spouse. Thus if in a family have emigrated both partners, the questionnaire was completed only by one to avoid recurrence.

For this investigation the next data were taken:

- Age and gender;
- The level of education;
- Marital status;
- The number of children;
- The country where the emigrant works;
- Domain of work;
- Year of emigration.

4. RESULTS

4.1. Emigration and its amplitude in Slănic Moldova city

After 1990, following the regulation of free movement of persons, there has been a significant migration of the population from Slănic Moldova towards abroad. Thus, in 2011, during the population census, 498 emigrants were registered, meaning 384 on long term (more than 12 months) and 114 temporarily (less than 12 months), emigrants over a long period representing 8.45% of the total registered population and 9.23 % if we consider only stable population. All this reality is the result of regression in economic activity characterized by tourism and spa treatment services which decreased significantly after 1990 (General Urban Plan, 2006).

Geographical distribution of emigration in Slănic Moldova (fig. 1), highlights Cireșoia locality, whose number of emigrants place it in the first position, being declared 183 people that have gone abroad for a long period, which means over 9% (fig. 1). Slănic Moldova locality lost through emigration over a long period 7.93% of the population, which in numbers means that 110 persons living abroad for more than 12

months out of a total of 1 387. Cerdac occupy the last position both in the total population and number of emigrants, but also lost through emigration more than 7% of the population in conditions in which the emigrants over a long period there are likely to remain abroad. According to the definitive annual flow of emigration, data from the National Statistics Institute, Slănic Moldova city lost in the period 1994-2012, 26 people, 19 of them after 2002, most being recorded in 2004 and 2012, meaning 4 and respectively 5 permanent emigrants.

Data from the 2011 Census show that two Italians and six Hungarians were registered in Slănic Moldova, two Italians and two other nationals in Cireșoia, in Cerdac being no immigrant. Whatever the real numbers, aware that the data do not correspond to reality since the statistics have their shortcomings, the fact is that Slănic Moldova lost people, thus emigration contributing to population decline. In Slănic Moldova as, in fact, across the country, many emigrants are not recorded. Some of the residents are working in other countries, for a period, without having the legal procedures for registration of change of residence or domicile. Thus, official data does not reflect the exact situation of the territory, but this data help us have a picture of the current situation. The fact that a significant number of people emigrated raises questions about the impact of their departure.

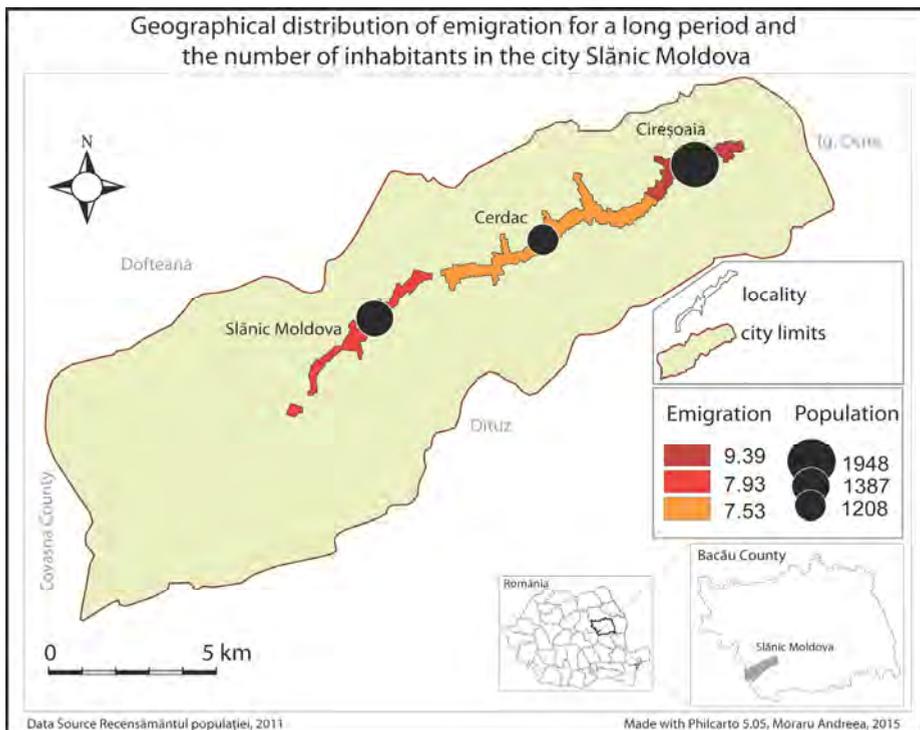


Fig. 1. Geographical distribution of emigration for a long period and the number of inhabitants in Slănic Moldova.

The data (fig. 2) show that during 2002-2011, the volume of emigration increased, without adding the people who have not been registered, because no member of the family remained in the city or the unreported emigrants by their relatives, for various reasons, or those who left permanently without being registered. Another loss in the statistics is due to the fact that some households were omitted during the census, a significant number of people stating that they were not registered, since no census member was in their household. According to official data from the Population Census, in Slănic Moldova emigration has increased after 2002, the number of people who chose as solution leaving the city increased from 84 emigrants in 2002 to 498 emigrants in 2011, meaning an increase of over 16 percent. Although Cireșoia locality has the highest number of emigrants in 2011, according to census data from 2002, it appears that Slănic Moldova locality has been the pioneer of emigration.

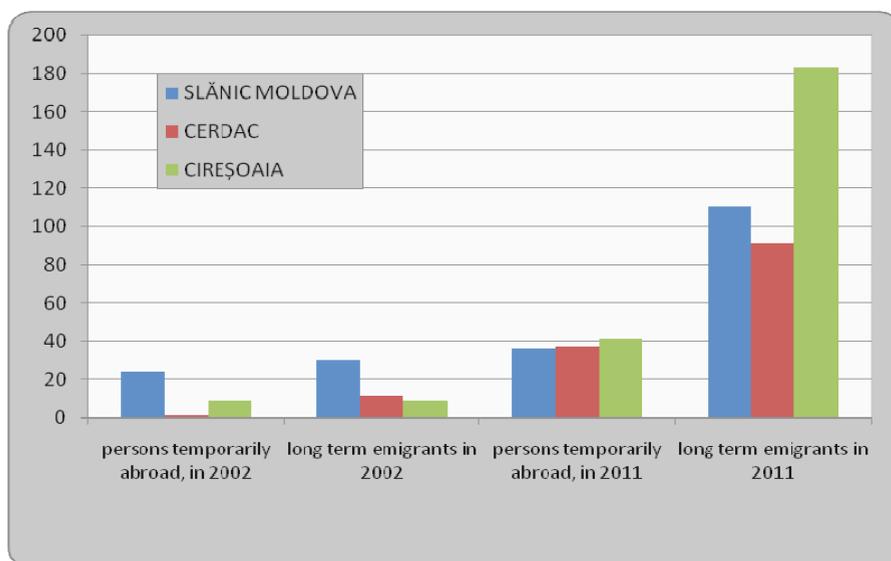


Fig. 2. The number of inhabitants from Slănic Moldova residing abroad.

According to data from the own survey, the country accession to the European Union seems to have had some effect on emigration in the city, the years 2007 - 2010 recording the maximum emigrants (fig. 3). Basically, 2000 is the year when emigration began to record some growth but claims that these figures cannot be generalized since it is possible that most of those who left before 2000 to be established in the destination country, not at home at the time of the investigation and not even having relatives who could declare them, so they have not been included in the investigation. Another limitation of this survey is the fact that in some cases, parents, who completed in the name of their emigrated children, argued that they do not know the year their children left since they left a long time ago. Certainly beyond quantitative shortcomings of this method, there is a reality that can justify this dynamic.

The higher growth after 2000 may have legislation causes, since Italy, which also is the main destination for emigrants from this city, approved some regulatory changes and here it is about two "adjustments, baptized with the name of initiators, Napoletano-Turco (in 2000) and Bossi-Fini (in 2002), when Italia decided to grant residence and labor permits easier to illegal immigrants" (Dimitriu et al, 2013, p. 110). This reduced financial costs of emigration so that this phenomenon has become more accessible. For people emigrated in 1984 and 1985 (fig. 3), resident parents were those who provided data, stating that their children emigrated to the United States at the beginning; the one who had left in 1984 focusing later in 2000 to Italy, the other one choosing the same country as the first, but later in 2002, being no family connection between the two. If their orientation to Italy after 2000 and 2002 was the consequence of this "regularization" or a coincidence, we have no way of knowing, the fact is that most times once emigrated, residents do not return, and, if are not satisfied in the host country, they try to find another option, most often being another country, or another city, returning home being perhaps the last option.

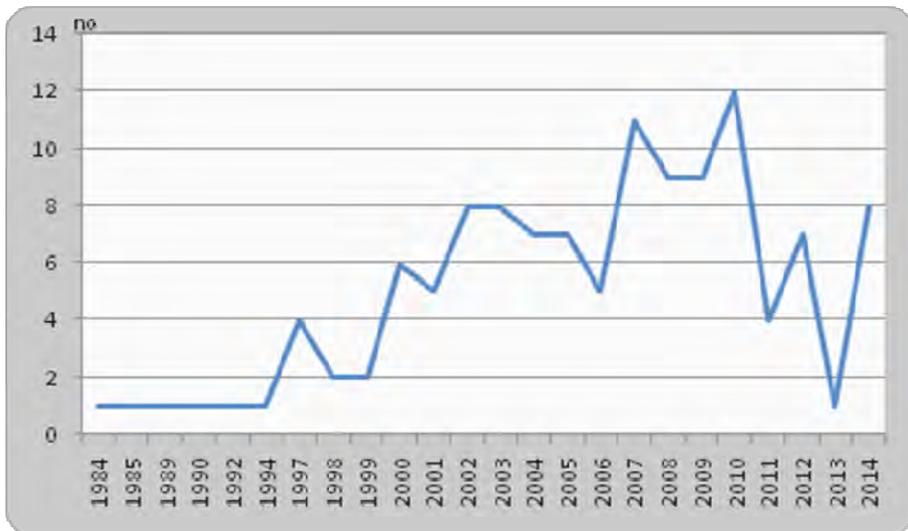


Fig. 3. The dynamics of emigration from the city Slănic Moldova.

4.2. The importance of emigration in the numerical evolution of the population

We have seen that through emigration, Slănic Moldova City lost a significant percentage of the population, but more than this direct effect on the evolution of the population, one should mention the long-term impact on the total population balance. Since, according to statistics, especially young population and especially women from Slănic Moldova emigrated, migration inevitably affect birth once by reducing the birth rate, young people postponing marriage, including bringing up children, and a second time through children who are born abroad. The situation is even more confused about

this statement if we consider that sometimes these children are not even registered here, sometimes inadvertently, sometimes unaware of this necessity or even the inability to find enough strong arguments to make such formalities as soon as the baby was born. This led, according to local officials, to the situation where some come to register their children when they have 1 year, 2 or even 3 years. So, to the numbers registered should be added those newborns who will someday be registered, but "not now".

Data from the National Statistics Institute offers information regarding this reality, for the years 2012 and 2013 a differentiated statistics being available for the total number of live births and the number of live births for habitual residence in Romania, meaning the residence of the mother in Romania. Habitual residence is where a person normally spends the daily period of rest, regardless of temporary absences for purposes of recreation, holiday, visits to friends and relatives, business, medical treatment or religious pilgrimage. Habitual residence can be the same or may differ from domicile, where people choose to establish habitual residence in another locality than the home country or abroad. Thus, according to National Institute of Statistics, the following persons are deemed to be ordinarily resident in Romania:

- People who lived at usual residence for a continuous period of at least 12 months before the reference date;
- Persons who have been established to address habitual residence in the 12 months before the reference date with the intention of staying there for at least a year (National Statistics Institute).

For the years 2012 and 2013 the newborns who are habitually resident in Romania represent 79 percent of all newborns in the city (fig. 4). In absolute numbers, this means 38 children with habitual residence in the city from a total of 48 for 2012 and 34 out of a total of 43 in 2013. Comparing the data we realize to what extent emigration has an effect over the total number of newborns with habitual residence in Romania.

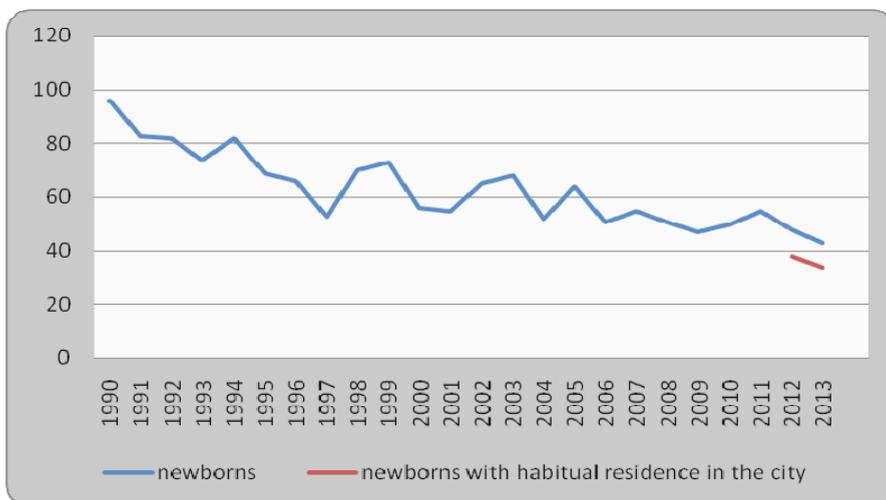


Fig. 4. The number of newborns in the city of Slănic Moldova, 1990-2013.

Statistics show a steadily decreasing birth rate, which, coupled with the increasing mortality and migration, translates into a decrease in population since both the natural and the migration balance is negative. Both birth and mortality have fluctuated in the period, but there is a general downward trend for the birth rate and an upward trend for mortality, pointing out that in 2013 were recorded lower values for mortality compared to 2012, recording a total of 46 deaths, value below which never reached since 1995. Of the deceased, in 2012 and 2013, 97% were habitually resident in Romania, Slănic Moldova. In addition to these data, which shows how migration affects mortality in this case, there are those cases of falling illness abroad, some respondents stating that there are cases of this type. Emigration affects more births than deaths; for mortality emigration effect is diminished, but the fact is that the population of the city continues to decrease and the impact of emigration is not insignificant.

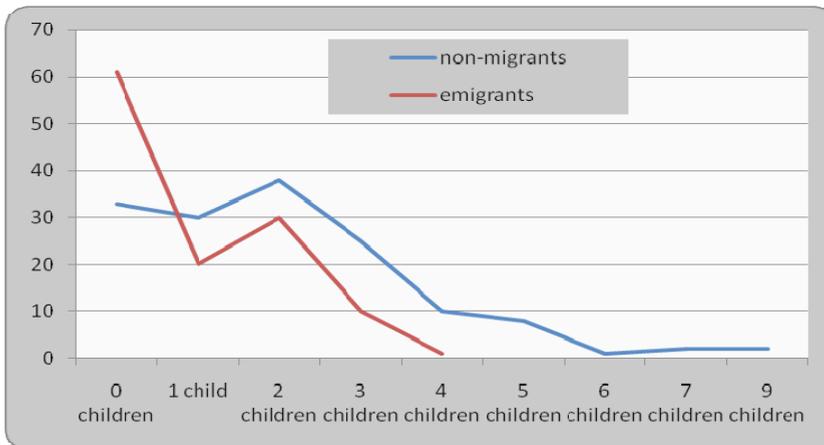


Fig. 5. The number of children.

In case of emigration, the chances of families to have many children are significantly reduced, 39.86 percent of the emigrants included in the survey said they have no children, no family of migrant parents having more than four children; to mention is that the latter case is unique between emigrant families. As regards the stable population surveyed, only 22 percent said they did not have children while over 8% have more than five children. So, in the city Slănic Moldova, in the non-migrant families there is a higher birth rate, each family assuming two children, while in the emigrant families the value is below. The fact that non-migrant families have more children than emigrant families could conclude that emigration significantly influence the birth rate, but the reality goes beyond these statements, partners level of education being also important. An example is that partners who said they have 9 children and two families with 5 children have primary and secondary schools. Another case is a family of seven children whose mother of 34 years said that she has finished only primary school, while a man of 39 years who emigrated and is married since 2001 has no children. There are cases where partners have said that their emigration influenced the decision not to have children, a special case being a couple, both over 30 years old who emigrated, soon after

they got married, him in the United Kingdom and her in Italy. These cases reinforce the idea that, in addition to emigration, there are many other factors that influence birth rate, but the fact is that when couples live in different countries, whether they have migrated both or just one, chances for them to have children are reduced.

To what extent the chances of emigrating are lower with increasing number of children per family, or to what extent the chances of having children decrease with emigration we cannot know exactly, but the fact is that the data shows that emigrant families have fewer children while stable families in the city have a higher birth rate. In support of this idea comes the director of the city school, who states that birth rates decreased significantly due to both emigration and other causes, which translates to closure of some classes as there are no longer enough children to ensure its functionality.

4.3. Importance of emigration in gender and age differences

A demographic aspect particularly important in estimating the costs of emigration is the fertile female emigration since the loss of human potential is higher for women. The younger they are, the more children they are able to give birth to, but they give birth and / or grow their children abroad. Overall, the census of 2011 showed that there were more women who emigrated more than 12 months than men. Thus, the gender structure of emigration recorded during the population census in 2011 show that women constituted over 53 percent. Geographical distribution of emigration by gender shows that male emigration predominates in the area Cireșoia with a rate of approximately 50%, meaning 90 women and 93 men, while in Slănic Moldova town women represent 60% of the emigrated population, in Cerdac women emigrants percentage being 54.94%.

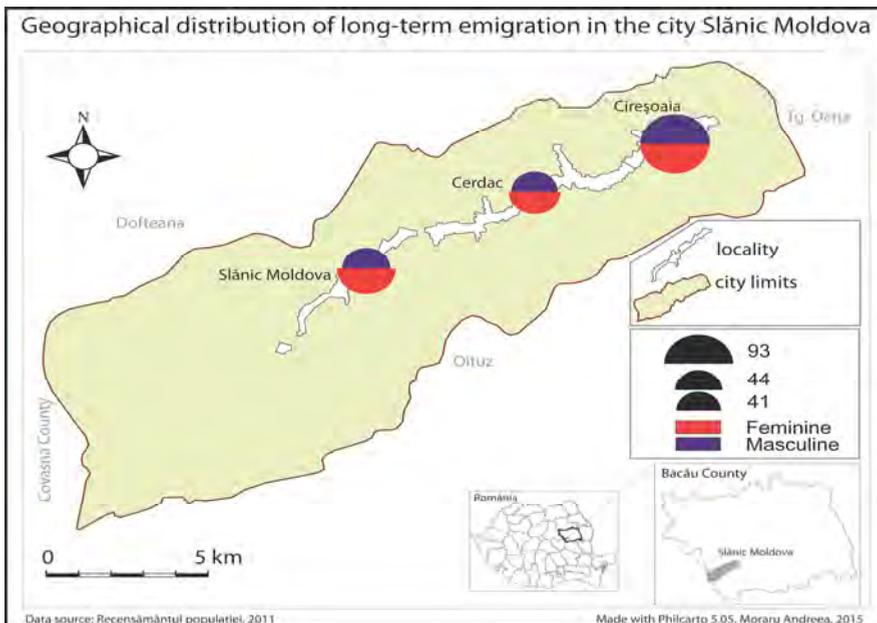


Fig. 6. Geographical distribution of long-term emigration in the city Slănic Moldova.

The temporary emigration by gender is also important because the female population has higher percentage, representing 65% of the total temporary emigrated population from the city; in all the three settlements this category is represented by a rate of over 55%. If we take into account the chances they have to remain abroad for a long period or even permanently those percentages are really impossible to ignore, long-term consequences on other demographic indicators being inevitable.

The emigration tendency to target young population is observed in the case of Slănic Moldova. The age structure of migration highlights the two groups which has the highest percentage of citizens from Slănic Moldova residing abroad. In 2011 people aged 18-40 accounted 62.2 percent (fig. 7) from the total number of citizens of this city who were living abroad, many generations born before 1990 therefore fits in the most exposed to international migration (Dimitriu et al., 2013). Followed by those in the age group 41-60 years, 28 percent, these two age groups totaling about 90 percent of all emigration recorded during the 2011 census. It also can be noted a slight tendency to increase the percentage of children living abroad who, according to data from the census, represent 7.9 percent of total city population living abroad. Of course, to these data, should be added those undocumented emigrants because the whole family lives abroad, being impossible to be registered during the census, and also emigrants from those families that have been overlooked by reviewers during research, as some people have said that they and their households were not registered during the census because of omission. So, of course we can say that there is a risk of error, since collecting statistical data records failings.

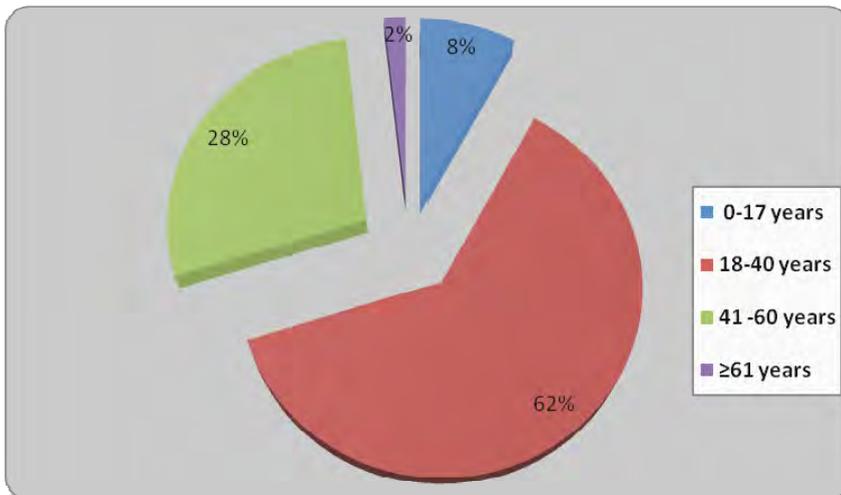


Fig. 7. Emigrants from Slănic Moldova, by age.

To analyze the impact of emigration on the structure by age was applied an adaptation of the formula used by Baude (2008, p. 71) to calculate the rate of emigration. He reports the population emigrated from a developing country to the population below

25 years old born in that country. His intention was to represent the probability of emigrating from that country. Being constraint regarding the access to statistical data, the limited age of 25 will be replaced with 40 years and, in this case, the limit of 40 is even more eloquent.

$$TMit = 100 * Mit / (Pit + Mit)$$

where:

TMit is the rate of emigration from the country *i* to the date *t*

Mit is the emigrated population originating from the country *i* to the date *t*, with less than 40 years

Pit is the population aged up to 40 years in the country *i* and the date *t*.

Applying the same formula of Baude (2008, p. 71), but for a population up to 40 years, for Slănic Moldova Baude's emigration rate is 8.65% while the population up to 40 years has a percentage over 55%. If this percentage is worrying or not we'll see.

An analysis of the emigration by age and gender is possible by using data from the own survey in the city, not having other statistical data on these indicators, not being supplied by the National Statistics Institute, which makes analysis impossible in this direction. We note that emigrants with young and old ages are almost nonexistent, but in the young ages the absence is due to the fact that, at the time of the investigation, no family of emigrants have said that the minor children are taken abroad, as in most cases they were left home with one of the parents or other relatives. Of course there are also cases where children are taken abroad, as we have seen, but at the time of the investigation they probably were not in the country or were omitted since the survey was randomly made and was not applied to all migrants.

Analyzing the data, we see that in Slănic Moldova males emigrate to a greater extent when they are young, and here stands the age group 30-34 years, while the highest percentage of emigrant women are recorded at older ages than for men, the highest values being between 45 and 49 years old. One reason is the field of work for which they emigrate: emigrated women generally work as housekeepers in Italy which explains more advanced ages while men emigrate to work in fields like construction, which requires good physical condition, young people being most preferred. Regarding the age groups, most migrants are between 20 and 49 years, for women high percentages being maintained even after this age, starting to fall to more advanced ages. In the case of emigrated old women, another reality of emigration should be mentioned, namely that in addition to a significant number of women working in the household, a great part of them emigrate in order to take care of grandchildren in the country where their children have emigrated, so sparing the money that would have to pay for a babysitter. A double reality is shown: there are numerous cases in which both spouses have emigrated and there are children who are born and raised in the destination country. If these children are registered here or not and what percentage of them appear in official statistics it is impossible to say, but this really gives us an insight into the effects of emigration on birth and hence over the numerical evolution of the population of this city.

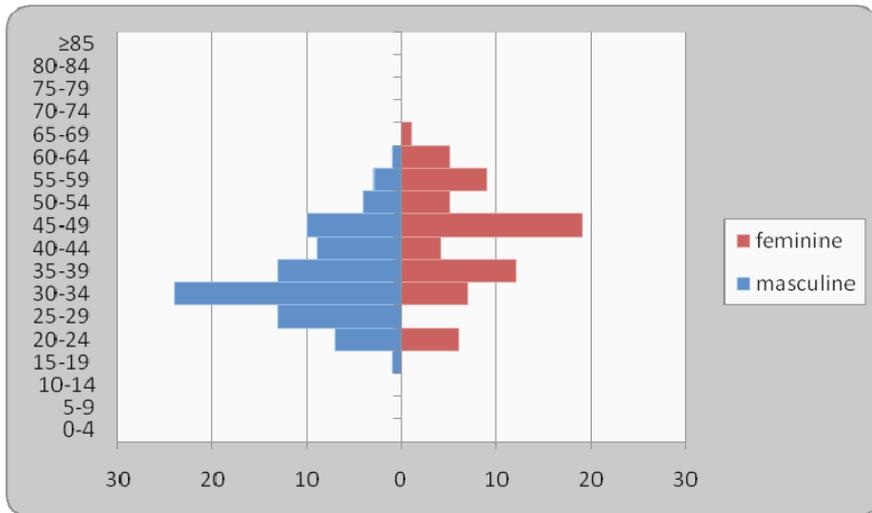


Fig. 8. Structure by age group and gender of emigrants in the city of Slănic Moldova.

As a result of natural growth and migration there have been significant changes in the structures by age and gender; manifesting a narrowing of the age pyramid base. As a result of maintaining a long period of negative natural balance and accelerating the process of labor emigration to developed European countries, the number of inhabitants has seen a continuous decline.

The city's population distribution by gender shows a rather balanced situation, with a slight numerical superiority of the female population, but if we look at the structure of gender and age groups note that the female population earns in percentage after the age of 55 years; before the age of 55 the percentage of women is exceeded by men percentage. Of course the causes of this reduction are due to the increased death rate among men after a certain age, and migration, including emigration. In recent years, the percentage of the female population has seen a steady growth, surpassed that of the male population, having a percentage over 50%, while in 1992 women represented only 48 percent of the total population. In terms of gender structure we see a further decline in the male population at older ages and here we can give the example of the 20-24 age group of 1990, who reached the age of 52-56 in the year 2014 who suffered a greater reduction in men than women and here the decrease cannot be correlated only with emigration since, according to census data, we saw that especially women emigrated.

The population of the age group that recorded the highest values for the year 1992 should now be aged between 52 and 56 years, but we see a decline in this category in the year 2014 (fig. 9), which is explained by the fact that some of them chose to emigrate, as we have seen in the chart with the emigration by age (fig. 7), as well as was stated earlier.

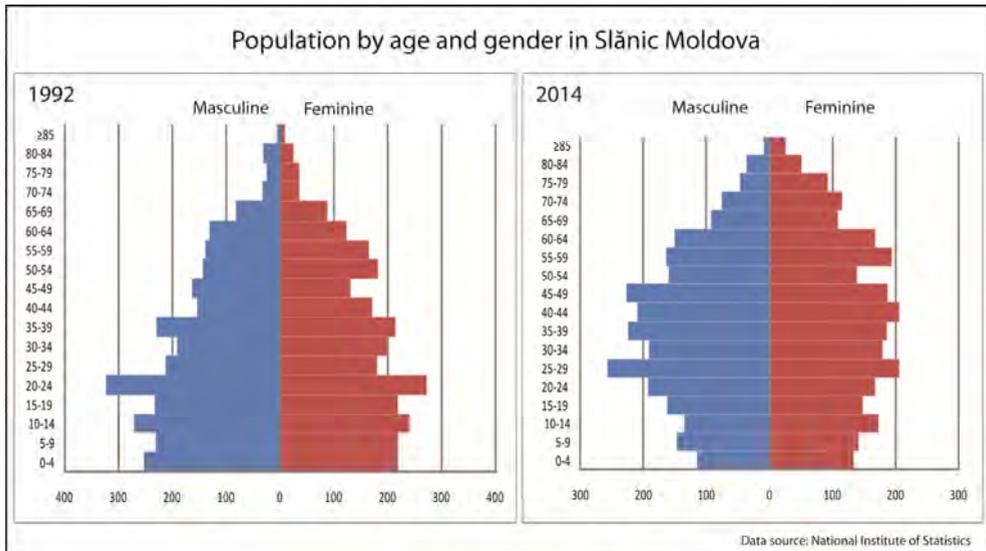


Fig. 9. Population by age and gender in Slănic Moldova.

As regards the geographical distribution of population by gender in the three localities, only Slănic Moldova locality has a predominantly female population, representing 52 percent, Cireșoaia and Cerdac localities having less than 46% and 47% female population. Adding this data to the emigration reality, where we saw that women are more active in this regard, we could say that demographics will inevitably be affected in the future, resulting in a continuing decline in the birth rate, which is already happening.

Another reality that leads to the narrowing pyramid at young ages is the fact that, once one of the parents emigrated, chances are high that the other parent and even children eventually to emigrate, after finishing high school or even in some cases only secondary school. At the time of the survey, there were families where the emigration occurred gradually, initially mothers emigrating to Italy followed by their husbands, who were followed in turn by children, especially boys, who chose to follow the same route immediately after finishing school. Neither in the case of female children such statements are not absent, but there seems to exert influence at a more advanced age; emigrant mother as "badantă" (taking care of a household in Italy) in Italy in 2006 helped her daughter to emigrate and work in the same field two years later, both currently working in Italy. There are also cases of young married, with one or two children, that has not emigrated since they receive money from their mothers who are working in Italy, this being seen as a financial support which combat youth emigration, that without the support of these mothers would not be able to support their families. If parents emigration favors children emigration in some cases, there are also cases where parents prevent children emigration, not seeing emigration as a necessity as they benefiting from money earned abroad by their parents.

Migration increases the city's population aging, since in emigration participates mainly young people and especially women, the city losing population once due to emigration of those persons and second, in long-term, due to the children that emigrants could have had or have them but are born in the country of immigration. Important to note is that in 2014 the aging factor reached 83.31%, a critical value, which notes a particularly advanced state of the phenomenon, given that in the year 1992 it was 25 percent. To calculate demographic aging ($\hat{I}d$) was reported the number of people aged 60 years and older (≥ 60) to the number of persons of 20 years and under that age (≤ 20), the value being expressed in percentage (Vert 1995, p. 39).

$$\hat{I}d = \geq 60 / \leq 20 * 100$$

4.4. The level of education and working areas

There are often talks about a brain drain that brings multiple losses to the country of origin, which itself draws attention. Analyzing education level structure, in the city Slănic Moldova, the situation seems to be the next one: the locals are more likely to emigrate when educational level is very low or beyond high school. Thus, comparing the studies that emigrants have with the studies of stable population, a higher percentage of emigrants finished primary or lower secondary education while at high school level stable population holds more significant percentage. Correlating these data with the birth rate, we can say that the level of education appears not to influence in a significant extent the higher birth rate among the stable population, since higher education is generally associated with low birth rates and here the resident population has lower rates for below-average degree than emigrants. Of course there are those individual cases, mentioned above, but in this case the tendency is to say that to some extent emigration and other factors, rather than level of education, influences the lower birth rate in families where one or both partners emigrate. The level of education is a component but not a pillar.

Work structure in the destination country of emigrants from city Slănic Moldova show a fairly wide area, according to own survey. It confirms the idea previously stated that women emigrate in higher proportion to older ages due the fact that, most of the times, they work in housekeeping in the destination country while men emigrate mainly at young age working in constructions, where the physical resistance is required that decreases with increasing age. Thus more than 50% of emigrants work in housekeeping and construction, agriculture and forestry being the following, with a rate of 8%. Another reality is the presence of a 4% percent of unskilled workers who do not have a steady job in the host country, working only on days when they find work. The category of "other services", which is extremely heterogeneous include a missionary priest in Ivory Coast, social worker, etc. The health sector is also important, destinations in this case being the United Kingdom and Italy with migrants for a long period indicating some stability in that country, thus the city losing health professionals while the nearest hospitals are in Onești and Comănești.

5. CONCLUSION

Slănic Moldova city registered a decreasing birth rate, which, cumulated with an increasing mortality and emigration, translates into a decrease in population number since both the natural and the migration balance are negative. Thus, the city registered a continuous demographic involution since 2002, after a continuous increase registered between 1992 and 2002. The geographical distribution of the inhabitants and the repartition of emigrants showed that Cireșoia locality (within the city) has both the highest percentage population and the highest emigration.

Distribution by age showed that men emigrate to a greater extent when they are young, especially between 30-34 years old, while the highest percentage of emigrant women are recorded at older ages than for men, the highest values being between 45-49 years. Gender structure of emigration recorded during the population census in 2011 show a feminization of emigration.

The emigration of the city residents affects and, in turn, is influenced by all demographic indicators, even if, as we have seen, we cannot define to what extent as the external migration, in all its complexity is not exactly quantified. The statistical gaps did not allow a more meaningful analysis. The fact is that if we want an answer closer to reality one only has to ask, as we did, those people who are directly affected by this phenomenon because they are the ones that can provide a clear picture of their reality, so that we can approximate the extent to which there is a positive or negative influence of emigration. We conclude with the meaningful words of a 53 year old lady, whose brother works as a shepherd in Italy: "Since migration has many negative consequences, why not working in your own country?"

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**DEMOGRAPHIC SPASMS –
A LIMIT OF SUSTAINABLE TERRITORIAL DEVELOPMENT.
CASE STUDY: THE DISTRICT OF CICEU**

ALEXANDRA-CAMELIA POTRA¹

ABSTRACT. – Demographic Spasms – A Limit of Sustainable Territorial Development. Case Study: The District (“Ținut”)² of Ciceu. Human component is currently the most precious resource, the only one which can generate production and consumption, fact that makes it play an important part in the sustainable development of the territorial unit it occupies. However, we know that most of the changes take place at the level of this component, of action and interaction, usually materialized in malfunctions, in demographic spasms constraining the support and design of a certain trend of development. Starting from this assumption, in this study, we analyzed the demographic spasms manifested in the District of Ciceu, a rural micro-region located in the central part of the North-West Development Region, where the decline of the population, especially the young one, as a result, distinctly or cumulated, of several mechanisms, has increased the imbalances between the age groups, leading to an increase of the economic dependency ratio and the age dependency ratio, a situation that raises serious questions as it appears that the population is below the limit required to support the sustainable development of this unit.

Keywords: *demographic spasms, the District of Ciceu, sustainability, dependency ratio, birth rate, death rate, emigration, immigration.*

1. INTRODUCTION

The demographic decline, obviously noted after 1990 in most of the developed or developing countries as Romania, is caused, at the level of each territorial unit, by a series of negative demographic phenomena, such as the decrease of birth rate, the increase of rural emigration and the massive emigration of adults, leading to a reduction of the ratio of the middle aged group, of the active population, of the fertile female population and of the children. In fact, these are the main causes directly contributing to the damaging of the age structure, of the social-professional structure, implicitly of the entire demographic mechanism, leading, therefore, to an imbalance between inbounds (birth rate and immigration) and outbounds (mortality and emigration) of the demographic system³.

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² “Ținut”, in Romanian, is equivalent of a regional taxon – microregion.

³ According to Vert C. population is to be studied “in a systematic vision” because at this level there is a continuous change in the number, structure and distribution of elements which, moreover, are interconnected. (Vert, C., 2001, *The geography of population, theory and methodology*, Edit. Mirton, Timisoara, pp. 16, 17)

However, the imbalance is caused by a lack of a counterweight between the demographic increase (demographic boom in the case of poor countries) and the biotic capacity of feeding a continuously increasing population. *These processes, with fundamentally negative evolutions, are seen as **demographic spasms**⁴, that constrain sustainable territorial development, drawing limits in its path, beyond which the demographic system becomes unable to support.* Of course, negative effects will be visible in the first instance at the level of the social development, but they will have a negative, long-term economic development, i.e. on those dimensions that ensure sustainable territorial development.

Without pretending to be exhaustive, the study aims to examine the phenomena that are in demographic spasm and the effects (conditionalities, consistencies) that they have on the sustainable development of the District of Ciceu, a rural micro-region where the population decline caused a reduction in workforce, thus stagnating in terms of human resource development. Also, this paper assesses the current state as well as the future possibilities of development of the District of Ciceu by means of human resources.

2. METHODOLOGICAL ISSUES

Sustainable development is the main objective of EU policy, and must be understood as “an indestructible aggregate of phenomena, processes and rules, unique in their spatial dynamics and interrelation”⁵, by which is aimed at economic and social affirmation of the territorial unit which it contains, removing disparities between countries, but also within the same country, in fact asserting territorial cohesion⁶.

Sustainable development aims to be a human development, achieved by the will of men able to produce, through the activities they carry out, the economic assertion of the region (state, etc.) they occupy, and its final result is welfare both individually and collectively. Thus, we find that natural and human resources are the main vectors of development in any territory, but the emergence of negative demographic phenomena endangers the optimum ratio population-resources and sustainable development can not be sustained in these conditions.

Demographic spasms, as limits of development in general, the sustainable one in particular, can be analyzed in terms of their component phenomena and their worrying evolution. Globally, there are two situations that cause demographic spasms. The first one is about overpopulation, as in the case of certain territories (South America, Africa, Asia) where population growth has become a problem because it was not linked to economic growth (underproduction as a result of the multiplication of the population). Secondly, there are territories with various resources (most of Europe, North America), but the population is below the one required to support sustainable development, as it

⁴ Cocean P., notes that certain phenomena are established as the true limits beyond which sustainability becomes questionable. (Cocean, P., 2010, *Regional Geography* - third edition restructured and added, Edit. Presa Universitară Clujeană, Cluj-Napoca, pag. 145)

⁵ Cocean, P. (2010), *op. cit.*, pag. 133.

⁶ In the documents SDEC (*Schéma de Développement de l'Espace Communautaire*) „[...]territorial cohesion is assigned a central role in the organization and management of community space. It becomes not only the third dimension, along with the economic and social one [...],but also a corollary of the development itself.” (Cocean, P. (coord.), 2009, *Mărginimea Sibiului. Planning and landscaping*, [...]). (Cocean, P. (ed.), 2009, Edit. Universitară Clujeană, Cluj-Napoca, pag. 7)

4. ANALYSIS OF DEMOGRAPHIC SPASMS IN THE DISTRICT OF CICEU

In the District of Ciceu, sustainable development is limited by demographic spasms which occurred as a result of population migration (both international and rural-urban migration), decrease of the natural balance and population aging, decrease of the economically active population (working in industry) and the resizing of the industrial activities of Dej City. Therefore, the demographic phenomena analyzed in this study are: *the numerical evolution of population, the general density and distribution of population, the population dynamic and the demographic structure of the population.*

3.2. Numerical evolution of the population

The numerical evolution of the population is an important indicator used to assess the quantitative trends of a population.

Analyzing the number of inhabitants in the 14 communes of the District of Ciceu at the censuses of the past 100 years, one finds that there were two trends, one of growth between 1890 to 1977 and a decrease since 1977, but decrease was higher after 1992. Evolutionary population trends were found by calculating *the absolute growth over a certain period* (fig. 2). Thus, we see that the District of Ciceu population decreased by more than 5500 inhabitants between 2000 and 2012. In 2012, the total population was 37308 people.

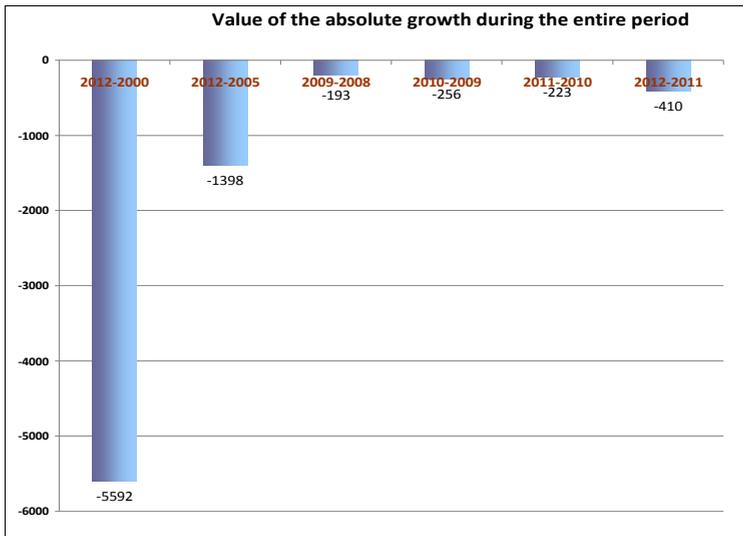


Fig. 2. The District of Ciceu. Value of the absolute growth during the entire period.

3.3. Population dynamics

The negative natural and migration balance are the main demographic characteristics of the population dynamics in the District of Ciceu.

The birth rate at the level of the area analyzed, is recorded in the relatively low trend, its values being, during the analyzed years, lower than the **mortality rate**. Analyzing birth rate and mortality rate at the level of administrative-territorial units, we notice certain significant differences. The lowest value of birth rate was recorded in the communes belonging, from the administrative point of view, to Bistrița-Năsăud County (for example, in Ciceu-Giurgești, in 1992, birth rate exceeded mortality rate, having the value of 15‰ and mortality was of 12‰, while in 2012, birth rate dropped to 6‰, and mortality rate increased to 25‰). Of the communes, Ileanda makes it self noticed, with a remarkable birth rate, higher, during the last analyzed year, than the mortality rate (fig. 3).

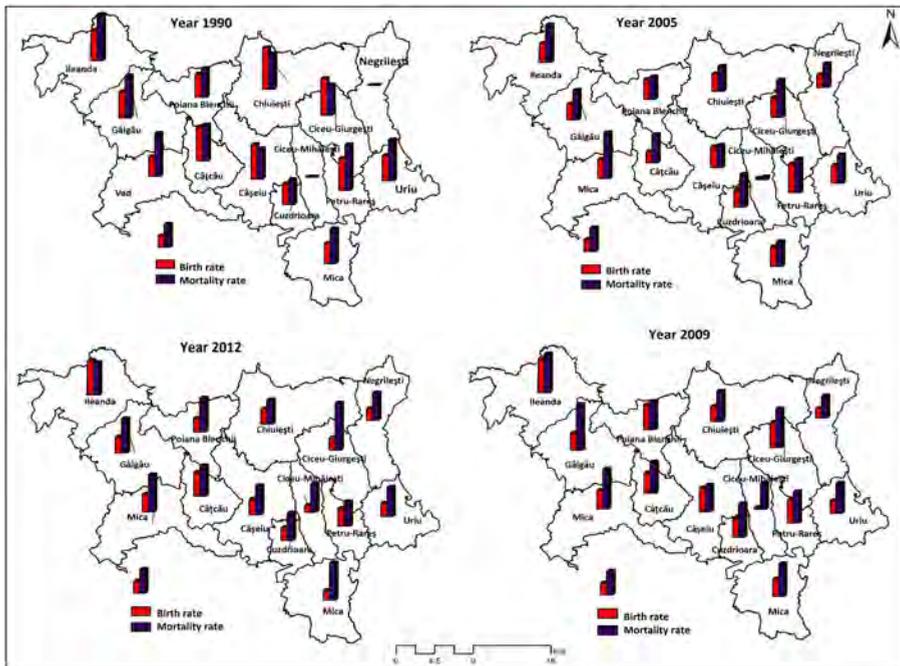


Fig. 3. Evolution of birth rate and mortality rate in The District of Ciceu (‰).

Natural demographic balance, the expression of the difference between the birth rate and the mortality rate has mostly negative values during the years analyzed, its values giving us a picture of the county population natural decrease.

This is one negative demographic feature of ex-communist countries, where economic and social transition has had an impact on the evolution of birth rate.

The fall of the communist political system influenced the decreasing of birth rate, because after 1990, every woman had the right to abortion, and if you look at the map of the evolution of birth rate and mortality (fig. 3), we see that the general trend is the decrease of the birth rate until 2012. This may be explained by the change in the mentality of the population, as the traditional family (specific to rural areas) is fading away.

Having many children is no longer a priority and most families have one or two children. The liberalization of the population movement led to increased migrant population, leading to a reduction of young population, and *of women of childbearing age*.

One must bear in mind that the female population of childbearing age, in the coming years, will come from generations born in a period (after 1990) when the birth rate remained low, so there will be a reduction of the fertile female population, automatically, the demographic aging process intensifies, one of the consequences being the increase of the mortality rate and further population decline, even of catastrophic dimensions.

Demographic spasms caused by **external migration** in conjunction with the **negative natural balance** hindered the development of the District of Ciceu due to their negative effects and, more specifically, due to the direct loss of the human resource and, more important, the effects in time of the deterioration of the population age structure. We have no data regarding the age of the population who emigrated from the analyzed area, but given that the value of the aging index of the population is very high, and knowing that labor migration in recent years has become the most important component of Romanian migration, we can say that the population who emigrated is mainly from the group of working age population (19-64 years). Because of this migration, but also the causes mentioned above, the birth rate stays low so in the future there will be a drastic reduction in the quantity of labor force when the current active population will fall into the category of aged population and its place will be taken by those born in this period of demographic decline.

Migration involves severe consequences at different levels: the economic, the social and the demographic one. In the District of Ciceu, migration reached its climax after 1989, in 1990, when the border barriers fell, but one notices (fig. 4) that the **rate of emigration** reached peak levels, higher than the net immigration. In 2004, when we can speak of national economic stability, the **immigration rate** exceeded the emigration one, situation which also partially occurred in 2007.

After 2007, the situation changed because Romania was already a member state of the European Union and the movement of Romanians was completely liberalized (in some European countries). This determined that another wave of massive loss of human resources through emigration, on the grounds of the economic crisis which was felt after 2008, but also the reshaping of industrial activity in Dej City, which ensured the jobs needed by the people of the surrounding areas for a long period, so the emigration rate of 2012 is comparable to 1990.

If we look at the values of migration rate at the commune level, it comes out that Vad commune lost the highest number of people in this way. In 1990, in Vad, the highest rate of emigration from the analyzed area was recorded, 183 emigrants out of 1000 inhabitants, and the rate of immigration on the same year was only 5 ‰. However, Vad commune is to be noticed in terms of reducing the number of inhabitants due to the natural balance, as the mortality rate remained at values above 25 ‰ between 1990-2012, while the birth rate had annual values under 8 ‰.

It should be noted that the immigrants include those who migrate to another place than home. In this regard, we point out the rural migration to urban centers, especially the developed ones. At the level of the province (land), their share in the total number of

DEMOGRAPHIC SPASMS – A LIMIT OF SUSTAINABLE TERRITORIAL DEVELOPMENT.
CASE STUDY: THE DISTRICT OF CICEU

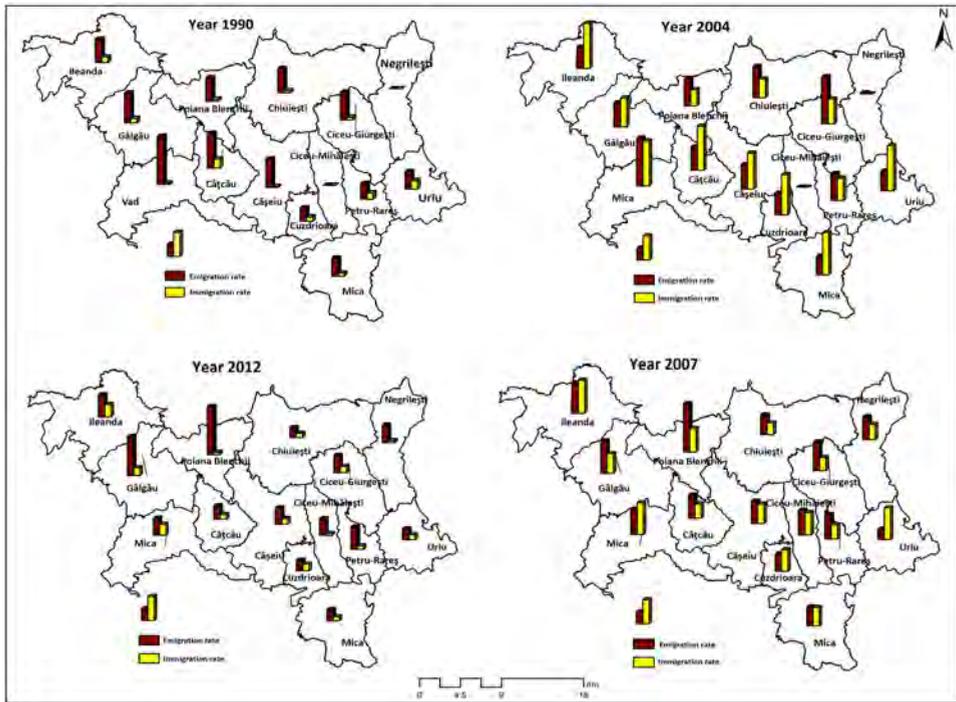


Fig. 4. The District of Ciceu. The evolution of emigration and immigration (%).

emigrants is not known, because there are no statistical data including domestic migration to other places in Romania. However, out of some discussions with representatives of the analyzed communes, it comes out that most of those who changed their residence moved to national urban centers, especially to the city of Cluj-Napoca. Regardless of the share of migration to another city in Romania or international migration, the total number of migrants remains important because it is obvious that those who are gone from one locality in the study area, changing residence or home, will be out for a long or permanent time, loss which results in fewer people of working age, in fact the population which these communities need for their economic, social and demographic development. In addition to this loss of human resources and the deterioration of the population age structure, there is another dimension of international migration, as dramatic as this one, acting especially at the social level. There are cases in the District of Ciceu where, from some families, parents are abroad and do not take their children with them, therefore grandparents, other relatives or friends take over their children' guardianship, which has negative repercussions. There are few cases of school abandonment, but this should be borne in mind, not to multiply such cases.

The loss of human resources results in slowing growth or even to decline in economic activity. In general, most people who migrate are young and their share is growing and therefore immigration affects the age groups with high rates of fertility,

thus reducing the potential for newborns. Due to this process and also due to increased longevity, the District of Ciceu is currently facing an accelerated process of **population aging**.

Another aspect of population decline, which has repercussions on the development of the District of Ciceu, is the deteriorating **age structure of the population**. Its effects in time are more important, as it leads to the aging of population. This demographic phenomenon is already known and has an impact in this micro-region, so the value of the demographic dependency ratio is very high. If we analyze the *population by age groups* (<19 years, 20-64 years, > 64 years), at the last three censuses (fig. 5), we notice that the elderly group increased by 6% during 1992-2011. The proportion itself is not very high, considering that 19 years have passed, but it should be noted that the share of 22.9% elderly population in the total population is a large one, which indicates that the population of the District of Ciceu is aged. It is more worrying that in 2011 the reduced number of young population was approximately equal to the number of elderly population, which supports the earlier claims that a decrease in working age population, an acceleration of the aging process of the population and an increase in the dependency ratio of elders will occur in the near future. Between 1992 and 2011 the group of adult population (19-64 years) decreased slightly (there were 4592 fewer people in 2011 compared to 1992).

The changes in population dynamics of the District of Ciceu have contributed greatly in a negative way, to the increase of the **dependency ratio** and **aging index**.

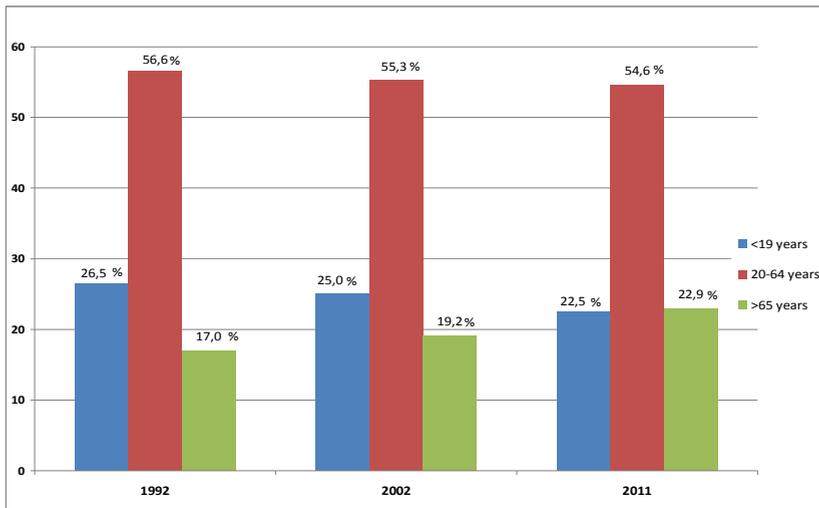


Fig. 5. The District of Ciceu. Evolution of population by age groups.

The *aging index* resulted by reporting the elder population (> 64 years) to the young one (0-19 years) indicates that the population of the District of Ciceu tends to grow older. Its value during the years analyzed was over 0.42 at the level of every commune. Therefore young population is less than one third of the total population. The

decline in active population and the aging of workforce is a major trend characterizing the demographic evolution of the District of Ciceu. Therefore, demographic dependency ratio has values indicating a high “pressure” of the population aged 0-19 years and 65 years and over on the population aged 20 - 64 years.

The demographic dependency ratio in the entire area studied had slightly higher values in 2011, when 83 people of inactive age corresponded to 100 people of working age (fig. 6).

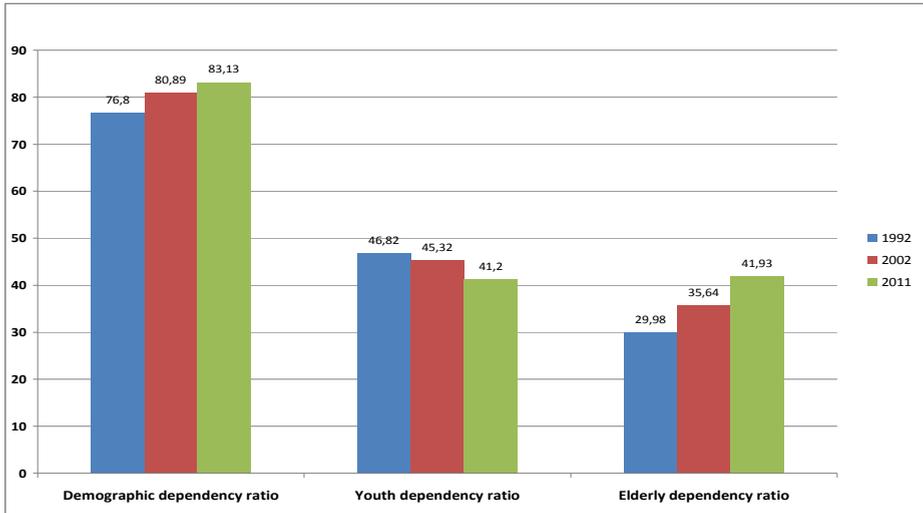


Fig. 6. The District of Ciceu. Evolution of the demographic dependency ratio (%).

Analyzing separately the categories that exert pressure on the working age population, we note that the elderly dependency ratio increased while the youth dependency ratio fell. Therefore, there will be less young population to enter the segment of the active population. The alarming increase in the elderly dependency ratio in the District of Ciceu, amid fluctuations in other categories of the population, has many social and economic implications, especially in terms of sustainability of pension systems. Reduction of the working age population may result in structural problems in the labor market.

Analyzing the population by gender, it came out that the share of the female population over 55 years is higher than the percentage of the male population of the same age, which causes a greater pressure on the pension system, knowing that the standard retirement age of the female population is lower than the one for the male population.

Under these conditions, of high demographic dependency ratio and deteriorating age structure of the population, the natural question is: what is the future of the working age population in the District of Ciceu? To find an answer to this question, we calculated the labor replacement rate, which renders the number of entries (population 15 to 19 years) in the population of working age per 100 outputs (population 60-64 years) of

the working age population. According to the result (fig. 7), the perspectives are highly questionable from this point of view. We note that in the communes affected by a deep process of population aging, the chances of the population exiting the active segment are minimal.

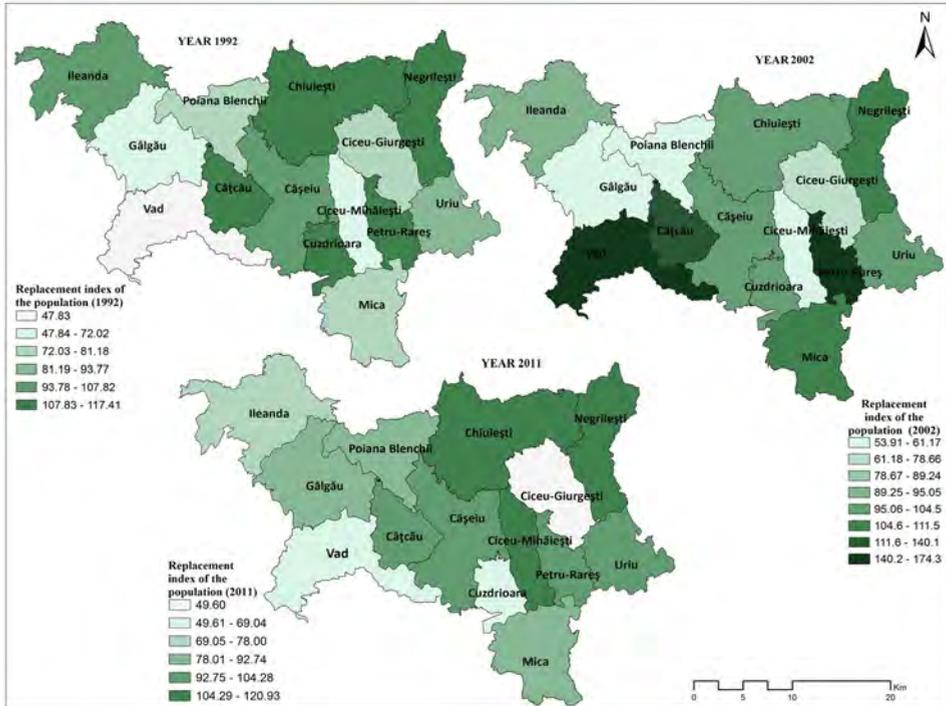


Fig. 7. The District of Ciceu. Evolution of the replacement index of the active age population (%).

Demographic spasms, have the worst implications in the process of sustainable development for any territorial entity and have an impact on the **social-economic structure of the population**. The economic structure of the population is given by the categories of the active and inactive one. In particular, the working population consists of people employed and those seeking employment (in the latter category we included the unemployed or those who are looking for their first job), while the inactive population includes all the persons not engaged in an economic-social activity and who are not looking for a job.

In the District of Ciceu, at the level of the professional structure of the population, demographic spasms occur due to numerous factors, including: the aging of the population, loss of labor through immigration, social-economic transition, reducing economic activity, especially the industrial one, leading to an increase of the number of unemployed, anticipated pensioners; also, it shows that many young people opt to continue their education after they turn 20 years of age without having a job.

The overall activity rate of the population, given the weight of the active population in the total population, was calculated at the last three censuses. It has experienced two opposite trends: a decline between 1992 and 2002, and an increase between 2002 and 2011. The overall activity rate decreased, which was felt, especially in the area bordering Dej City (fig. 8), where the scaling of industrial activity in the period immediately following the fall of communism, led to a rapid growth in the number of unemployed persons on the background of social-economic changes during the post-communist period and the inability of economic structures (services sector) to absorb the labor force from the industry.

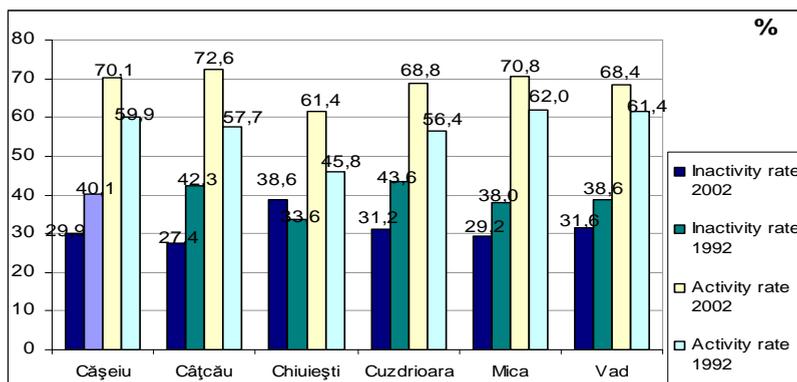


Fig. 8. Evolution of the activity and inactivity in the surrounding area of Dej City (%).

The overall inactivity rate had high values throughout the analyzed period (1992-2011), determining a very high economic dependency ratio. In 2002, in each commune, the share of inactive population in the total population exceeded 65%, reaching a maximum of 72.6% in Cățcău commune. A significant increase of the activity rate in the period 2002-2011 was recorded in the communes belonging to Sălaj County. Thus, in 2011, in these administrative-territorial units, the activity rate increased by over 15% compared to 2002, when the activity rate of the population was low. The highest values of the activity rate, between 2002 and 2011, were recorded in the communes which belong to Bistrița Năsăud County. In some cases the activity rate values were higher than the inactivity rate, as for example in Ciceu-Giurgești and Negriștei, where the rate of activity had higher values than the inactivity rate both in 2002 and in 2011.

Analyzing the inactive population categories between 1992-2011, we find that the share of the population supported by other persons or the state increased significantly. Thus, in 1992 their share was reduced, while in 2011 it increased significantly. The situation is worrying because this category includes, among other social cases, those depending on the welfare state, which means that although there are people considered of active age, they do not hold a job, amplifying the pressure on the state economy.

At the basis of the claim according to which the rate of active population of the District of Ciceu has decreased due to resizing industrial activity, sits the *professional structure of the active population*, according to which a high proportion of the active

population worked in the secondary sector in 1992 (fig. 9). Therefore, at the level of the entire studied area, there was a sharp drop in the employment in the secondary sector. In 1992, over 30% of the total population was active in this segment, while in 2011 only 9.1% of the population was active in this sector. The reduction of the working population in the secondary sector led, besides the growth of the inactive population, to a conversion of redundant labor from industry to the primary sector. Many of these people currently work in agriculture, but this is worrying for the economic development of the province, as the agriculture specific to Romanian rural areas is subsistence farming and most people working in agriculture actually work in their own household.

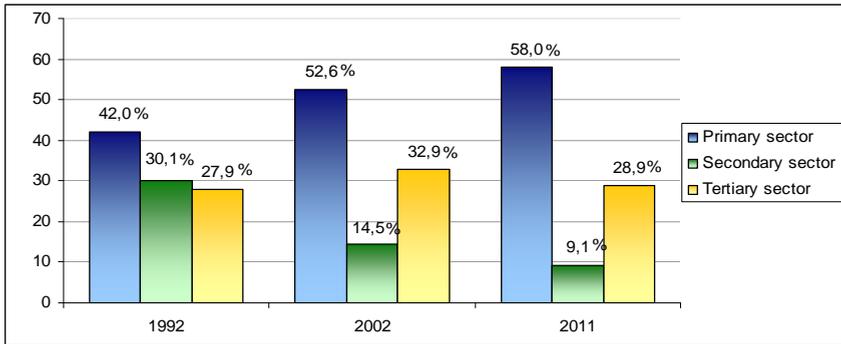


Fig. 9. Active population by economic sectors.

Analyzing the *unemployment rate of the population* in the District of Ciceu (fig. 10), it came out that it decreased between 1992 and 2011, but it should be noted that the decrease in the unemployment rate did not occur due to jobs available to the unemployed, but due to the short legal period of unemployment. Most of the unemployed joined the inactive segment, thereby increasing the economic dependency ratio.

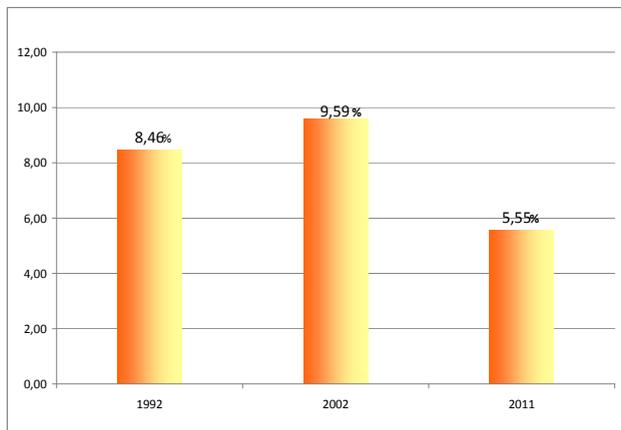


Fig. 10. Evolution of the unemployment rate in the District of Ciceu (%).

4. CONCLUSIONS AND PROPOSALS

Demographic spasms limiting sustainable development arise from the imbalance that occurs between inputs and outputs of the demographic system. In this sense, globally, demographic spasms occur either in the territories where the population boom is not related to the carrying capacity of the territory or in the territories where population decline compromises the production by drastically reducing the human resource. This latter situation characterizes Romania, respectively the District of Ciceu, micro-region whose capacity in terms of human resource development has been analyzed in this case study.

The current demographic situation of the District of Ciceu is the cumulative result of complex developments, birth rate (fertility), mortality rate and external migration after 1990. These negative fundamental developments deteriorated the age structure of the population, accelerating the aging process. It is worrying that due to an external migration higher than the natural growth and also mortality rates higher than birth rates, there has been a drastic reduction of labor active population, thus increasing the demographic and economic dependency ratio. This situation will worsen in the future, given the low percentage of young people who will enter age of employment in the coming years. The increase of the dependency ratio of elderly people deepens, on short and medium term, the effects of the economic crisis.

On the grounds of the lack of jobs, the population decline in the District of Ciceu after 1989 did not have, until now, dramatic economic effects, but the danger is imminent. With a population aging index exceeding the value 1 and a low economic activity rate (the active population is under 40% of the total population), the question is how viable is the District of Ciceu capacity of development, problem for which solutions must be found so as to stimulate the positive development of population and hence labor resources.

In terms of human resources, several strategic directions of development in the District of Ciceu could be:

- attracting investments and undertaking activities to capitalize intense and appropriate local labor, strictly correlated with its degree of skill;
- maintain the working population through the development of economic activities both in the secondary sector, of production, and the tertiary sector of services;
- helping people who left from the communes of the District of Ciceu to come back and start up businesses to capitalize the existing natural and human potential;
- starting projects to attract European structural funds for development;
- reduction of employment in agriculture by developing competitive agri-food economic sectors (processing of local agricultural products, marketing of traditional agro-pastoral products, creating organic farms whose products are required by the specific European markets).

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DEVELOPMENT POLICIES IN ALBA IULIA AREA OF INFLUENCE. AN INTEGRATED APPROACH

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OANA BLAGA¹, I. RUS¹

ABSTRACT. – Development Policies in Alba Iulia Area of Influence. An Integrated Approach. The paper represents an integrated and holarchical perspective on the spatial development policies and its component measures and projects related to the City of Alba Iulia, its area of influence and the all-encompassing County of Alba, Romania. The goal was to see how the development and management policies from all levels merge into a single strategic framework that might create a favourable basis for the sustainable growth of Alba Iulia and its area of influence. As this area surrounding the city is subjected to different hierarchical plans and programmes, some that are not properly correlated, it is extremely clear that this area and Areas of Influence in general need legislative stipulations made specifically for them and also a well-thought holarchical planning approach.

Keywords: development policies, strategic framework, Area of Influence, intercommunity development association, City of Alba Iulia.

1. INTRODUCTION

The idea behind this article came from a series of discussions held within our research group, in order to generate a geographical study that would present the matrix of the strategic development plan for the Area of Influence of Alba Iulia City. The fundamental objective of our paper is to analyse the policies, programmes and projects of those territorial planning documentations that have been created to solve some existing disfunctions in the study area. The integrated approach of territorial management policies is a must so that we could emphasize the existing opportunities and restrictions found in Alba Iulia area of influence in terms of balanced and sustainable development. The interpretation of the results of the mid-term application of the development strategies in an actual context (2020-2030 horizon) was also a priority of our study. The suitability of territorial administration from a strategic framework point of view means that the local authorities (County Council, the Regional Development Agency, mayoral offices, intercommunity associations, local action groups, non-governmental organizations) have to pull together in order to manage a dynamic, differentially developed

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territory, where the urban-rural influence vectors have a pulsatory behaviour in relation to the polarising centre of Alba Iulia. Another important objective of our study is the correlation between the fundamental premises and the real possibilities for their actual application in the field:

- are territorial management policies suitable tools for transforming the area of influence of Alba Iulia into a competitive area at regional level?
- can a strong interaction between public, private and local communities lead to certain, visible and quantifiable results in terms of growth / development / economic and social change of the study area?
- is Alba Iulia Area of Influence a correctly demarcated territorial cut, one that is prepared for an integrated development?
- do the territorial development scenarios offer a favourable basis in order to perfect the urban-rural relations within Alba Iulia area of influence?

2. STUDY AREA

In regards to the study area, it is located in the central-eastern part of Alba County, with a surface area of 2695.3 km² and a population of 243611 inhabitants, comprising 34 basic territorial-administrative units. On top of this territorial „tile”, there is an Area of Influence demarcated by the County Territorial Plan, furthermore there is the Alba Iulia Intercommunity Development Association, also known as “AIDA”, and four local actions groups (LAG): Munții Metaliferi-Trascău-Muntele Mare (MMTMM); Valea Ampoiului-Valea Mureșului (AM); Țara Secașelor Alba-Sibiu (Ț.S AB-SB), and Mureș-Târnave (MT).

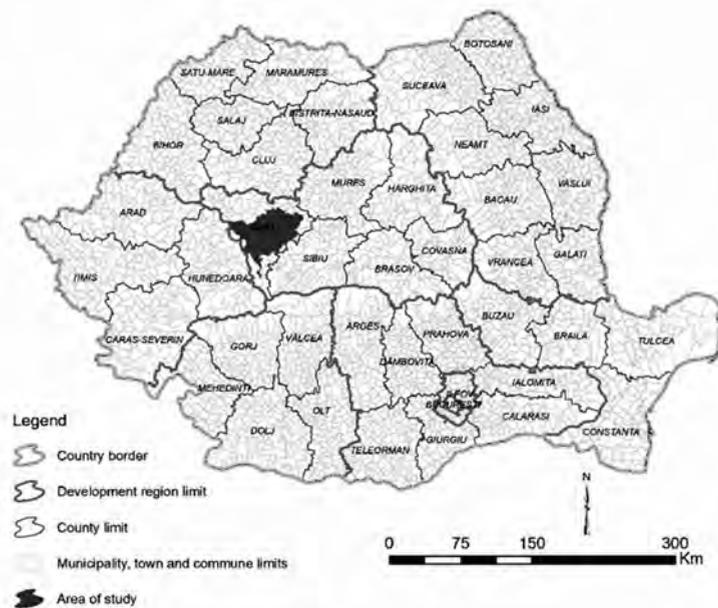


Fig. 1. Location of the study area within the national context.

Table 1.

**The affiliation of the basic administrative-territorial units
to different territorial „cuts”**

Nº	TAU Name	Surface (km ²)	Pop. (2014)	PATN	PATJ	IDA	MMTMM	AM	Ț.S AB-SB	MT
1	Aiud	138.1	26668							
2	Alba Iulia	102.4	73717							
3	Almașu Mare	89.3	1306							
4	Berghin	75.5	2088							
5	Blaj	98.8	21148							
6	Blandiana	74.8	976							
7	Bucerdea Grănoasă	41.7	2422							
8	Cergău	47.8	1668							
9	Ciugud	43.8	2955							
10	Crăciunelu de Jos	25.2	2136							
11	Cricău	50.6	2099							
12	Cut	27.4	1291							
13	Daia Română	41.3	3128							
14	Galda de Jos	101.2	4429							
15	Ighiu	129.5	6841							
16	Întregalde	82.8	672							
17	Lopadea Nouă	92.7	2778							
18	Meteș	143.5	2896							
19	Mihalț	65.1	3330							
20	Ohaba	40.1	713							
21	Pianu	122.6	3599							
22	Rădești	33	1349							
23	Roșia de Secaș	52.3	1619							
24	Săliștea	60	2330							
25	Sâncel	51.9	2718							
26	Sântimbru	44.8	3002							
27	Sebeș	113.8	32500							
28	Stremț	68.9	2514							
29	Șibot	44	2495							
30	Șona	105.6	4476							
31	Șpring	88	2637							
32	Teiuș	44	7541							
33	Vințu de Jos	88	5449							
34	Zlatna	266.8	8121							
	Total	2695.3	243611							

Legend: PATN (NTP) = National Territorial Plan; PATJ (CTP) = County Territorial Plan; AIDA (Alba Iulia IDA) = Alba Iulia Intercommunity Development Association; MMTMM = Munții Metaliferi-Trascău-Muntele Mare; AM = Valea Ampoiului-Valea Mureșului; Ț.S AB-SB = Țara Secașelor Alba-Sibiu; MT = Mureș-Târnave.

3. MATERIALS AND METHODS

In terms of methodology, a first step was to consult the existing planning documentations for the analysed territory. The suitable approach in such a context was their top-down interpretation, as we logically followed and gather in a single spot the holarchically arranged policies, starting at the national level (NTP) and going all the way to the local level (local development strategies, general urban plans). The following step was to define the key legislative concepts and consult different studies. According to the Ministry of Regional Development and Public Administration (MRDPA), **the regional development policy** is the ensemble of planned measures promoted by the central and local authorities in conjunction with different interested actors (public, private, volunteers) in order to promote a sustainable economic growth by efficiently capitalising regional and local potential, with the end goal of improving quality of life. The principles that form the basis for the creation and application of regional development policies are (according to MRDPA, 2015):

- decentralising decision making, from the government level to regional and local communities;
- partnership between all actors involved in regional development;
- planning – process of using resources (through programmes and projects) to achieve preestablished goals;
- co-financing – the financial contribution of diverse actors involved in regional development programmes and projects.

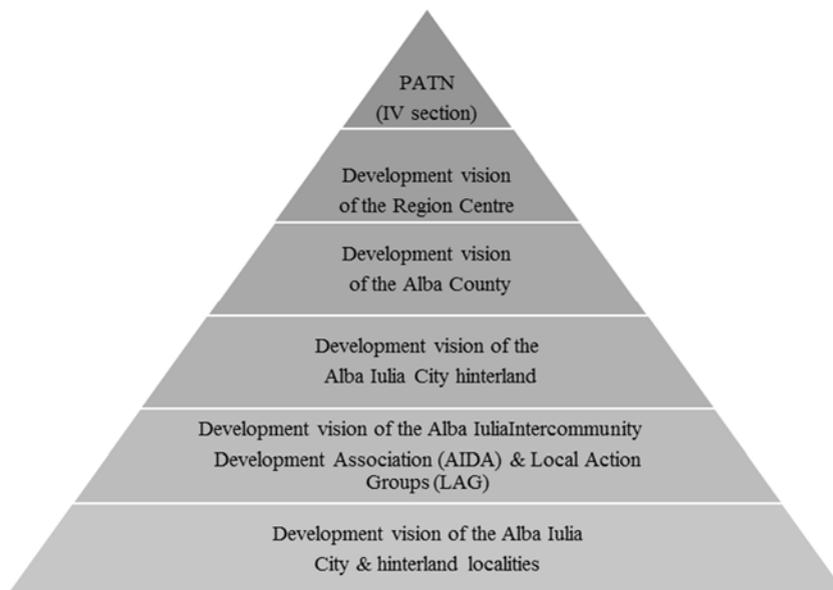


Fig. 2. Vision for development.

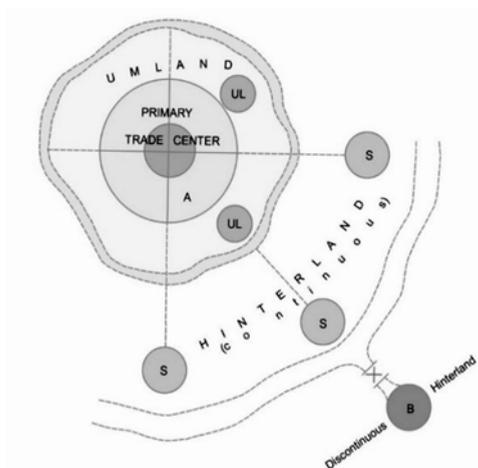


Fig. 3. Diagrammatic illustration regarding umland and hinterland characteristics (E. van Cleef, 1941). UL – urblets or suburbs, A – primary centre; B – other centre; S – satellites; X – the break areas between the continuous and discontinuous zone.

According to Law no. 351/2001 regarding the approval of the National Territorial Plan – Section 4 – The Settlement Network, the **area of influence** is defined as the territory and the settlements that surround an urban centre and which are directly influenced by the city's evolution and intercondition and cooperation relationships that arise in terms of economic activity, food provision, access to social and commercial services, utilities and rest, recreation and tourism infrastructure. The size of the area of influence is directly related to the size and functions of the polarising city.

The consolidation of the city's position in the territory and also the amplification of its functions lead to the formation of social-economic convergence areas, whose size is determined by population and the relevance of the cities' functions (V. Cucu, 2001). Another key concept, the hinterland describes a settlement's catchment area (or that of an establishment within the settlement): it is the area for which the settlement acts as a trading nexus (Derek Gregory et. al, 2009). Furthermore, the hinterland can be the area adjacent to a trade center (extending to and including its satellites) within which economic and some cultural activities are focused largely on the primary center (E. Van Cleef, 1941).

4. ESTABLISHING THE AREA OF INFLUENCE

The demarcation of Alba Iulia Area of Influence expresses the view of local authorities which is transposed in Alba Iulia Diagnosis and in the County Territorial Plan. The main criteria for setting such an area is the Reilly-Converse formula, applied according to the stipulations found the NTP, Section 4 - the Settlement Network, which states that the influence radius of a rank 2 city – county residence – must be between 60-80 km, which only partially corresponds to the actual situation, Alba Iulia having a polarising capacity below those values (roughly 50 km). Another issue comes from the existence of rather different views in regards to these limits. The Area of Influence mentioned in the CTP refers only to the periurban area, encompassing 15 administrative units from the city's vicinity, while Alba Iulia City Hall claims that the city's hinterland is larger, with 33 units. In the latter case, the functional subordination criteria of lower tier urban centers was largely employed, Alba Iulia having primary functions, whith the exception of economic powerhouse, which, at county level, is held by the City of Sebeș.

Reilly's Law of Retail Gravitation (Reilly, 1931) defines the relative ability and probability of two cities to attract customers and therefore trade from a third trade area or intermediate place for non specialty goods. In particular, this ability to attract trade from the intermediate place or trade area is in direct proportion to the populations of the two cities and in inverse proportion to the square of the distances from these two cities to the intermediate town. This relationship is expressed as follows (Steven J. Anderson et al., p. 2-3):

$$\left(\frac{Ba}{Bb}\right) = \left(\frac{Pa}{Pb}\right) \left(\frac{Db}{Da}\right)^2$$

where: Ba = the proportion of the trade from the intermediate city attracted by city a ; Bb = the proportion of the trade from the intermediate city attracted by city b ; Pa = the population of city a ; Pb = the population of city b ; Da = the distance from the intermediate town to city a ; Db = the distance from the intermediate town to city b .

Converse's revision of Reilly's Law (Converse, 1949), known as the Breaking-Point Model, extended Reilly's Law by defining the breaking-point of trade between two cities. A customer residing at the location of this trade breaking-point would be indifferent to trade area and have an equal or 50% probability of shopping at each of the two cities in question for non specialty goods. In particular, this ability to attract trade between the two cities or trade areas is in direct proportion to the square root of the populations of the two cities and in inverse proportion to the distance between these two cities. This relationship is expressed as follows (Steven J. Anderson et al., p. 2-3):

$$Da \rightarrow b = \frac{d}{1 + \sqrt{\frac{Pb}{Pa}}}$$

where: $D(a \rightarrow b)$ = the breaking-point from city a , measured in kilometers, to city b ; d = the distance between city a and city b . Travel time may be substituted for distance; Pb = population of city b ; Pa = population of city a .

We emphasize the idea that the role of theoretical models for determining areas of urban attraction becomes an efficient and pragmatic tool only when computer modeling is adjusted according to the actual geographic facts and situation. The augmentation of the area of influence determination procedure was based on two gravitational models (demographic and economic), which, methodologically, were developed by a collective of researchers (M. Ionescu-Heroiu et al., 2013) under the guidance of The World Bank, The Romanian Ministry of Regional Development and Public Administration, and The Romanian Ministry of European Funds. The gravitational models were developed based on a simple formula. Basically, for each settlement the Euclidian distance to every other settlement was calculated. The demographic gravitational model was attained by adding the population product from Alba Iulia and the population of the settlement that interacts x_i , divided by the square of the distance between them. The economic model was calculated in a similar fashion, substituting population with firm revenues (M. Ionescu-Heroiu et al., 2013). Starting from the above mentioned, the two gravitational models were applied, thus placing the City of Alba Iulia and the settlements found in its Area of Influence in interaction. The result was translated into two maps created by Alba Iulia City Hall. For the demographic gravitational attraction the applied formula was the following:

$$GA_{Dem} = \frac{PAb * Pxi}{(DAbxi)^2}$$

where: GA_{Dem} = demographic gravity attraction; PAb = population of Alba Iulia; Pxi = population of locality situated in hinterland, where i has values from 1 to 34 (total number of central places); $DAbxi$ = distance between Alba Iulia and locality situated in its hinterland.

The demographic interaction between the command center and the other central places emphasizes a high flow between Alba Iulia, Sebeș and Vințu de Jos Commune, while at the other end of the spectrum we find poor interactions between the county seat and communal centers like Cergău, Rădești, Ohaba, Sâncel, Șona, and Roșia de Secaș. This is due to the proximity effect exerted by the urban centers of Aiud and Blaj, both having an essential role in spatial polarisation by offering important functions for the population (commercial, medical, economic and educational attraction). The influence vectors show a true force line along Mureș River, with four urban centers (Aiud, Teiuș, Alba Iulia, Sebeș), stretching for 49 km. Almost all communal centers located north-west and south-east gravitate towards this axis. That is why we consider the formation of a conurbation comprised of Alba Iulia-Sebeș-Vințu de Jos as having favourable emergence conditions.

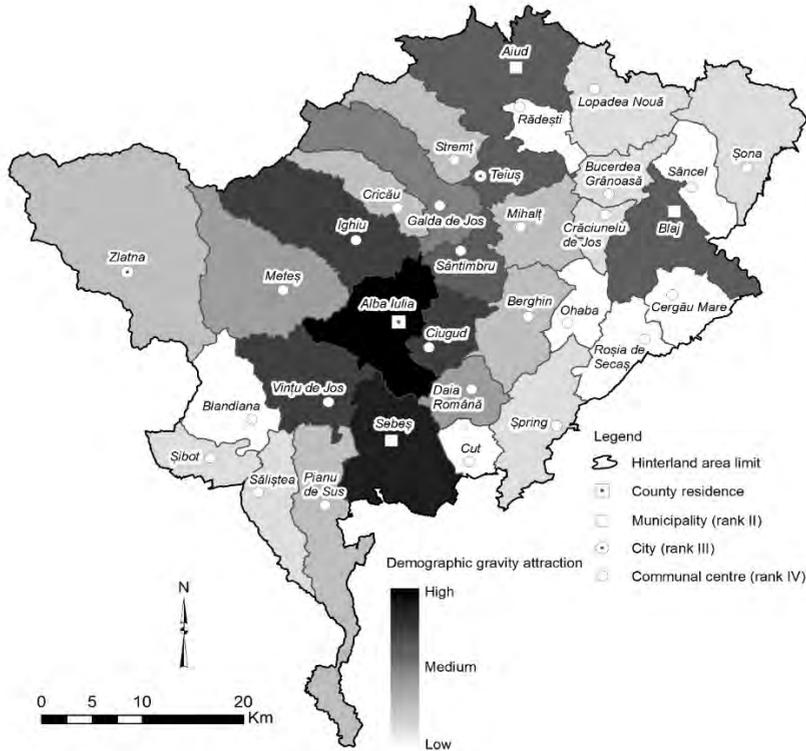


Fig. 4. The demographic gravitational model: Alba Iulia – Hinterland.

We applied the following formula for economic gravitational attraction:

$$GA_{Ec} = \frac{C_i Ab * C_i xi}{(D_{Ab} D_{xi})^2}$$

where: GA_{Ec} = economic gravity attraction; C_i = company revenue from Alba Iulia; C_{ixi} = company revenue from locality situated in hinterland; $D_{Ab} D_{xi}$ = distance between Alba Iulia and locality situated in its hinterland

The economic interaction has the same intensity between Alba Iulia, Sebeş and Întregalde Commune. However, it is the City of Sebeş that is characterised by a special and strong economic effervescence, with real chances of becoming the number one economic spot on the county map. Massive investments and the localisation of over 1300 enterprises make Sebeş the city with the lowest unemployment rate in the country (below 2%). Zlatna and Teiuş are the least economically developed urban centers, having a monofunctional profile and suffering from numerous industrial restructurings.

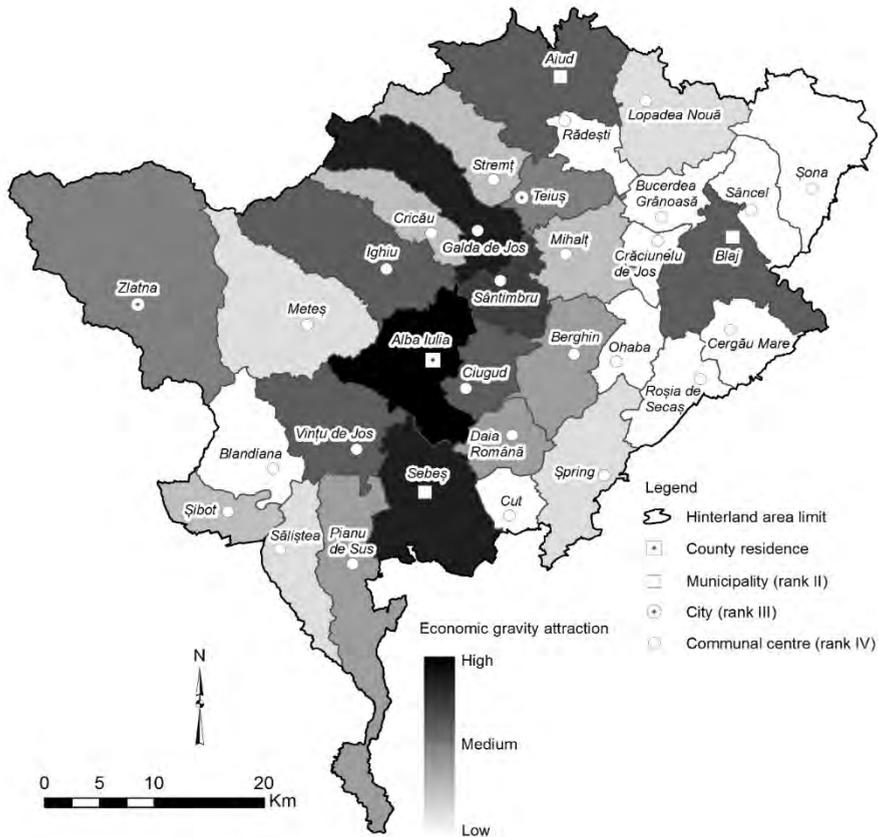


Fig. 5. Economic gravity attraction in Alba Iulia hinterland.

5. DEVELOPMENT VISION

5.1. Development vision according to NTP (Section I – the transport network)

According to the National Territorial Plan (Section I – the Transport Network), Alba Iulia will act as a transport node at county and regional levels. Thus, the city will become a rail and road node due to the A10 highway (under construction) and the presence of Teiuş and Vinţu de Jos nodes. One must also take into account that the same documentation mentions plans for a small airport. Likewise, the following development directions for the transport network are proposed:

- road transport networks: the A10 Zalău – Cluj Napoca – Turda – Alba Iulia – Sebeş Highway;
- rail networks: conventional rail lines with speeds up to 160 km/h on rehabilitated lines: Arad – Simeria – Vinţu de Jos – Alba Iulia – Coşlariu – Copşa Mică – Braşov – Ploieşti – Bucureşti – Feteşti – Medgidia – Constanţa;
- navigation on certain river sectors: on Mureş from the Hungarian border to Alba Iulia; river nodes on Mureş at Arad, Deva and Alba Iulia;
- air transportation: new airport near Alba Iulia (Aurel Vlaicu Airport);
- combined (intermodal) transport network: existing combined transport terminals which will be expanded and rehabilitated: Alba Iulia terminal.

5.2. Development vision at Central Region level (according to the Central Region Development Strategy 2014-2020)

The Central Region Development Region for 2014-2020 is part of the Central Region Development Plan 2014-2020 and also the main planning and programming document and regional level document. Being based on a detailed diagnosis, and also on a regional social-economic analysis and a SWOT (Strength-Weaknesses-Opportunities-Threats) framework, the strategy takes into consideration the major needs of the region and intends to capitalise on its true development potential. The Regional Strategy follows in its entirety the three priorities set by the Europe 2020 Strategy: intelligent growth, sustainable growth, growth favourable to inclusion. The Central Region Development Strategy defined its global objective as follows: *“balanced development by stimulating economic growth based on knowledge, environmental protection and sustainable capitalisation of natural resources as well as strengthening social cohesion”*. This framework document refers to six strategic development domains, each with its own priorities and specific measures:

- urban development, regional social and technical infrastructure development;
- increase in economic competitiveness, stimulating research and innovation;
- environmental protection, increase in energy efficiency, stimulating the usage of alternative energy sources;
- rural area development, stimulating agriculture and forestry;
- increase of regional tourist attractiveness, support for recreational and cultural activities;
- human resource development, improvement of social inclusion.

5.3. Development vision of Alba County 2014-2020 (according to the CTP)

Within the strategic framework of the County Territorial Plan (CTP), the declared general development goal is the creation of economic and social benefits/opportunities for local communities. The policies of this major objective are: revitalising and promoting cities; increasing the quality of life in urban and rural areas where public infrastructure is poor (see table 2). Likewise, the plan is to reconfigure territorial cooperation into the development of an economic corridor (Alba Iulia-Aiud-Blaj), based on existing urban-rural association forms: Alba Iulia Intercommunity Development Associations (AIDA), Sebeş Subregion, and Blaj Microregion. This corridor is determined by the need for an economic development consortium in the form of industrial and logistical parks, which will capitalize on the existence of transport infrastructure, available land and utilities. The strategic objectives involve: 1) balanced spatial development; 2) attaining sectorial objectives regarding transport infrastructure, utilities, education and healthcare, economic, environment, as well as public management; 3) materializing the specific objectives for urban and rural communities.

The sectorial objectives regarding the management aspects are linked to transport infrastructure, utilities, education and healthcare, economic, environment, as well as public management. The strategy is applied to an integrated network of measures employed at the urban-rural partnership level (according to CTP, 2008):

- for the transport network domain - the increase of the county's accessibility to national and European transport corridors, as well as the increase of mobility between the basic administrative-territorial units;
- territory endowment - the reduction of territorial disparities by improving utilities and basic services;
- economic competitiveness is intended to follow the spirit of economic promotion and growth;
- the preservation, rehabilitation and extension of the natural heritage;
- identifying capitalization, protection and promotion forms for the specificity of the county's cultural heritage, tangible and intangible.

The specific objectives have a series of measures for the development of urban and rural areas. For urban areas the measures are as follows:

- capitalizing the opportunities for developing research, urban infrastructure and technology;
- insuring fair access to city services for all citizens;
- keeping a balance between economic activities and the cultural and natural heritage.

The development objectives for rural administrative areas (communes) intend to increase economic competitiveness, community ability to cope and improving the quality of life through:

- promoting economic growth and insuring accessibility and mobility conditions;
- improving leadership for local communities;
- improving access to healthcare services;
- development of education services;
- improving basic utilities of rural areas;
- maintaining a balance between the economy and the natural environment.

Table 2.

Development priorities (according to the Alba County Development Strategy, 2014-2020 horizon)

No.	Basic TAU	Water supply	Hot water supply	Sewage and rainwater drainage	Wastewater treatment	Industrial wastewater treatment	Central heating through public services	Waste management	Waste management 2	Public transport: capacity and frequency	Public transport: transport lines	Pollution level	Local and county roads, including bridges and passageways	Green areas	Recreational areas	Social services	Healthcare services	Education services	Public building rehabilitation (safety, stability)	Public building rehabilitation (energy efficiency)	Rehabilitation of heritage buildings	Natural and man-made risks	Polluted industrial land	Citizen safety	Public service quality
URBAN																									
1	Alba Iulia																								
2	Aiud																								
3	Blaj																								
4	Sebes																								
5	Teius																								
6	Zlatna																								
	First priority (1-3 years)	75 %	12 %	88 %	100 %	50 %	50 %	63 %	25 %	25 %	25 %	100 %	38 %	25 %	50 %	100 %	50 %	63 %	38 %	50 %	38 %	38 %	75 %	100 %	
	Second priority (3-5 years)			12 %		13 %	12 %	38 %	12 %	25 %	25 %	12 %		38 %	63 %	50 %		25 %	25 %	50 %	25 %	12 %		25 %	
	Third priority (5-10 years)	25 %	38 %			12 %	25 %		25 %		25 %	63 %		24 %	12 %			25 %	12 %	12 %		38 %	50 %		
	Not the case		50 %			25 %	63 %	12 %		50 %	25 %										25 %	12 %	12 %		
RURAL																									
7	Almaşu Mare																								
8	Berghin																								
9	Blăndiana																								
10	Bucur-dea Grănoasă																								
11	Cergău																								
12	Ciugud																								
13	Crăciunelu de Jos																								
14	Cricău																								

No.	Basic TAU	Water supply	Hot water supply	Sewage and rainwater drainage	Wastewater treatment	Industrial wastewater treatment	Central heating through public services	Waste management	Waste management 2	Public transport: capacity and frequency	Public transport: transport lines	Pollution level	Local and county roads, including bridges and passageways	Green areas	Recreational areas	Social services	Healthcare services	Education services	Public building rehabilitation (safety, stability)	Public building rehabilitation (energy efficiency)	Rehabilitation of heritage buildings	Natural and man-made risks	Polluted industrial land	Citizen safety	Public service quality
15	Cut																								
16	Daia Română																								
17	Galda de Jos																								
18	Ighiu																								
19	Întregalde																								
20	Lopadea Nouă																								
21	Meteș																								
22	Mihalt																								
23	Ohaba																								
24	Pianu																								
25	Rădești																								
26	Roșia de Secaș																								
27	Săliște																								
28	Sâncel																								
29	Sântimbru																								
30	Șibot																								
31	Șona																								
32	Spring																								
33	Stremț																								
34	Vințu de Jos																								
	First priority (1-3 years)	76 %	14 %	66 %	72 %	20 %	4 %	68 %	36 %	30 %	14 %	16 %	90 %	42 %	50 %	52 %	64 %	60 %	40 %	26 %	28 %	14 %	8 %	70 %	72 %
	Second priority (3-5 years)	8 %	6 %	14 %	12 %	18 %	8 %	8 %	14 %	14 %	14 %	6 %	10 %	32 %	16 %	32 %	16 %	18 %	30 %	22 %	28 %	20 %	16 %	8 %	8 %
	Third priority (5-10 years)	2 %	34 %	10 %	8 %	24 %	34 %	2 %	10 %	20 %	24 %	36 %	12 %	14 %	2 %	6 %	8 %	14 %	30 %	20 %	36 %	34 %	4 %		
	Not the case	14 %	46 %	10 %	8 %	38 %	54 %	22 %	40 %	36 %	48 %	42 %	14 %	20 %	14 %	14 %	14 %	16 %	22 %	24 %	30 %	42 %	18 %	20 %	

5.4. Development policies for Alba Iulia area of influence

Currently, there is no legislative or political framework for the management of urban areas of influence. The only stipulations are found in some definitions from framework documents regarding metropolitan areas, that is NTP (Section 4 - The Settlement Network). That is why the following steps are needed to be taken:

- creating a conceptual horizon in regards to the terminology that designates the area of influence;
- creating a legislative and strategic framework for those urban centres that play an important role in spatial polarisation, based on their rank and attraction capacity;
- augmenting by law the urban-rural cooperation;
- creating an online geographic database that will present, in real times, influence vectors;
- preparing rigorous studies regarding the clear and correct determination of Areas of Influence, as they have a major role in identifying the most significant territorial relations (I. Ianoş, 1987).

5.5. Territorial management policies in Alba Iulia Intercommunity Development Association (AIDA)

AIDA encompasses the territory of 11 basic territorial-administrative units (Alba Iulia, Sebeş, Teiuş, Berghin, Ciugud, Cricău, Galda de Jos, Ighiu, Meteş, Sântimbru, Vinţu de Jos), covering an area of 937.1 km² and having a population of 125086 inhabitants. According to AIDA, the periurban development policy suggests the simultaneous and correct approach to every existing problem and interest found at the urban-rural relational level. By establishing AIDA, its creators intended to improve Alba Iulia influence in the territory and transforming it into a true regional pole. AIDA's sustainable development strategy is a planning tool directed towards implementation, having the following roles:

- describes the area's qualities and flaws, based on the analysis of the existing situation;
- defines realistic development objectives and creates a coherent vision in terms of the area's development potential and opportunities;
- coordinates technical and sectorial plan and policies and makes sure that the planned investments will help promote a balanced development of AIDA and its adjacent region;
- coordinates and concentrates from a spatial point of view the usage of funds by relevant actors from the public and private sectors;
- ensures the coordination between local entities and correlation at regional level, as well as the involvement of citizens and other partners that might substantially contribute to the qualitative modeling of the economic, social, cultural and ecologic future of every important area for AIDA and in each relevant domain.

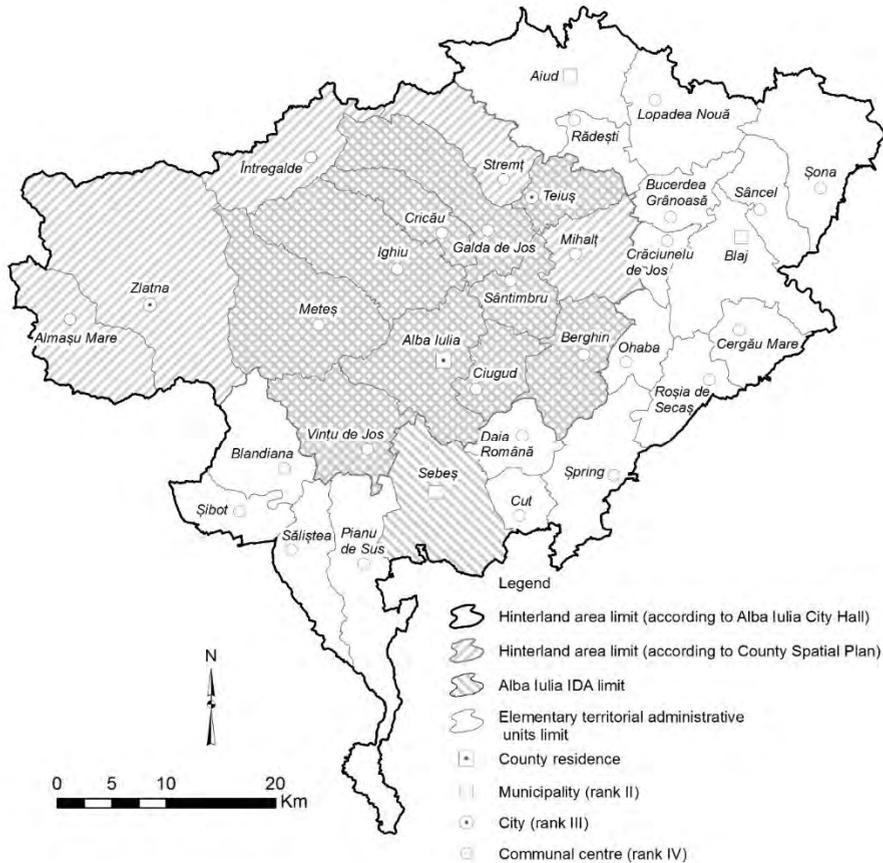


Fig. 6. Alba Iulia hinterland limits overlay.

Table 3.

Territorial management policies in Alba Iulia IDA

Objectives	Policies
Strategic Objective 1	
The development and consolidation of infrastructure and of the urban-rural partnership in configuring and establishing	Ensuring a multi-level government of the association
The Intercommunity Development Association of Alba Iulia as a competitive development pole at regional and national levels (key concept: the development, establishment and consolidation of territorial roles based on the association's potential).	The development of the AIDA policentric system
	The development of the Vințu de Jos – Sebeș - Alba Iulia – Sântimbru – Teiuș intermodal transport system

DEVELOPMENT POLICIES IN ALBA IULIA AREA OF INFLUENCE. AN INTEGRATED APPROACH

Objectives	Policies
<p>Strategic Objective 2</p> <p>The intercommunity development association improves the quality of life of every member community by providing access to quality services, to diversified living conditions for all members and by insuring a clean environment (key concept: attractiveness for joining the association).</p>	<p>Attracting and retaining young people in AIDA</p> <p>Development and diversification of habitation</p> <p>Insuring internal mobility</p> <p>Insuring access to water and sewage networks for IDA communities</p> <p>Insuring the use of sustainable energy</p> <p>Insuring access to heating systems for households</p> <p>Insuring access to waste management systems (according to the County Action Plan)</p> <p>Accessibility to information for the AIDA community</p> <p>Accessibility to education</p> <p>Access to proper healthcare services</p> <p>Access to social services</p> <p>Public safety and security for AIDA communities</p> <p>Access to culture and religious services</p> <p>Insuring sport and recreation services</p> <p>Insuring a good management in order to support the IDA development</p>
<p>Strategic Objective 3</p> <p>Sustainable economic development, competitiveness through private-academic / research-public partnership, in traditional and innovative fields (key concept: economic development structures in support of the association's competitiveness).</p>	<p>Planning a competitive economic development based on intersectorial partnership</p> <p>Supporting the development of existing economic activities in order to promote those high performing societies and domains, as well as supporting individuals with high potential</p> <p>Development of the SME (small-medium enterprises) sector</p> <p>Increase of SME productivity and competitive capacity</p> <p>Attracting foreign investment and improving access to external markets for SMEs</p> <p>Sustaining the development of trade and services</p> <p>Improving the professional capacity of people active in agriculture, silviculture and food industry</p> <p>Development of information and knowledge dispersal schemes regarding PAC support</p> <p>Updating agricultural exploitations by invigorating the work force and adapting it to European standards</p>

Objectives	Policies
	<p>Increasing the competitiveness of food-processing and forestry enterprises</p> <p>Administration of water resources and providing utilities at European standards</p> <p>Increasing the capacity of subsistence farms to penetrate the market</p> <p>Consolidating the relationship between production, processing and marketing</p> <p>Increasing the performance of farms through consultancy programmes</p> <p>Usage of agricultural lands found in mountain areas</p> <p>Usage of agricultural lands from disadvantaged areas</p> <p>Usage of agricultural methods compatible with environmental protection and improvement</p> <p>Insuring the long term biological balance of rural areas</p> <p>Creating and / or continuing infrastructure projects</p> <p>Creation and development of basic services</p> <p>Protecting the cultural heritage</p>
Strategic Objective 4	
<p>Ensuring a balanced and sustainable environment by preserving and capitalizing on the cultural and natural heritage (key concept: the sustainable management of the natural and cultural heritage in support of the association's attractiveness and competitiveness).</p>	<p>Extension / modernisation of water delivery systems / sewage systems</p> <p>Development of integrated waste management systems</p> <p>Contaminated site rehabilitation</p> <p>Infrastructure and management plan development for biodiversity and Natura 2000 network protection</p> <p>Flood protection</p> <p>Rehabilitation of urban heating systems</p> <p>Coordination in environmental data and information collection</p> <p>Management of development projects</p> <p>Institutional development for a better environment</p> <p>Creating and implementing management plans for natural protected areas and insuring a proper management framework for those institutions responsible for nature and landscape protection</p> <p>Industrial site rehabilitation</p> <p>Development/modernization of infrastructure necessary for a sustainable capitalization of those natural resources that have touristic value</p>

Objectives	Policies
	Creating an infrastructure for preventing the effects of floods and decreasing its destructive consequences
	Reducing pollution by rehabilitating heating systems and attaining the energy efficiency targets
	Restoring and capitalizing the historical and cultural heritage, as well as creating and updating the ancillary infrastructure
	Protecting and preserving the tangible cultural heritage
	Capitalizing the tangible cultural heritage
	Increasing the role of culture in local communities
	Promoting IDA cultural values at national and international levels

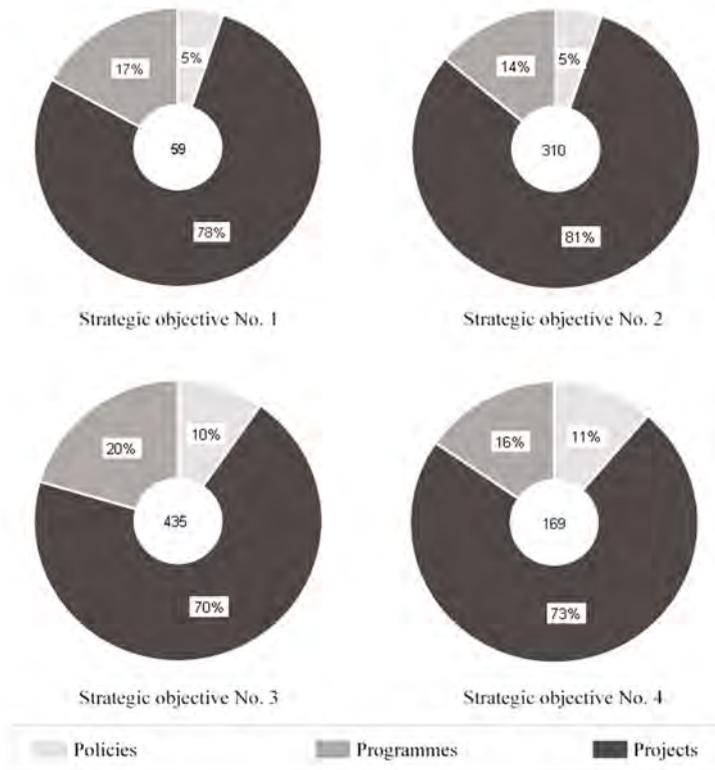


Fig. 7. The strategic framework tendencies.

Table 4.

Quantification of strategic objectives - Alba Iulia IDA

	Strategic objective no. 1	Strategic objective no. 2	Strategic objective no. 3	Strategic objective no. 4
Policies	3	16	42	19
Programmes	10	43	89	26
Projects	46	251	304	124
Total	59	310	435	169

5.6. Development vision at Local Action Group level

Local Action Groups are partnerships and such a partnership is all encompassing, including not only government organisations, but also non-governmental bodies, private companies, legal persons, etc., primarily from rural areas, that work in conjunction in a vast array of fields. Its objectives are for example the ecological reconstruction and the preservation of natural protected areas, but also community economic development, the promotion and preservation of traditional values, the physical and intellectual development of young people, and the creation of national and international partnerships.

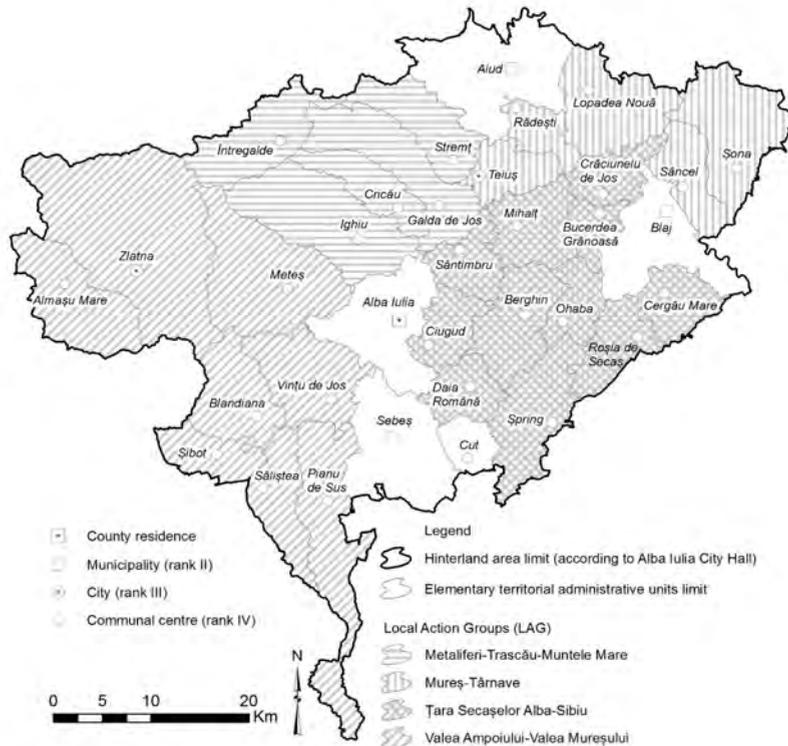


Fig. 8. Local Action Groups in Alba Iulia hinterland.

Table 5.

List of Local Action Group and their development measures

Nº	Local Action Group	Founded in	Development measures
1	Metaliferi-Trascău-Muntele Mare	2009	m1. Modernisation of agricultural exploitations
			m2. Rural cadastre
			m3. Improvement and development of infrastructure in regards to the adaptation of agriculture and forestry
			m4. Support for the creation and development of microenterprises
			m5. Encouraging touristic activities
			m6. Rehabilitation and development of villages, improving basic services for the rural economy and population and making most of the rural heritage
			m7. Creating multifunctional service centres for the entire community
			m8. Implementing cooperation projects
			m9. Running the Metaliferi-Trascău-Muntele Mare LAG
2	Mureş-Târnavă	2010	m1. Young farmers initiative
			m2. Modernisation of agricultural exploitations
			m3. SOS Nature
			m4. Village rehabilitation and territorial endowment
3	Țara Secașelor Alba-Sibiu	2011	m1. Human resource development and improving the quality of the workforce
			m2. Supporting entrepreneurship and improving the marketing of local products
			m3. Updating agricultural farms
			m4. Local products promotion
			m5. SOS Nature
			m6. Green areas and afforestation
			m7. Village renovation and the improvement of territorial infrastructure
			m8. Promotion of rural space values, of the material and immaterial heritage
			m9. Support for the creation of microenterprises that capitalise the local potential
4	Valea Ampoiului-Valea Mureșului	2011	m1. Improving and developing the infrastructure connected to agriculture and forestry
			m2. Implementing cooperation projects
			m3. Professional training, information and knowledge diffusion
			m4. Modernisation of agricultural exploitations
			m5. Increasing the added value of agricultural products

Nº	Local Action Group	Founded in	Development measures
			m6. Support for the creation and development of microenterprises m7. Rehabilitation and development of villages, improving basic services for the rural economy and population and making most of the rural heritage

5.7. Territorial development premises and tendencies of Alba Iulia and AIDA (mostly a geographical approach), according to AIDA framework document

The numerous advantages held by Alba Iulia are a solid basis for an increase in social, cultural and economic influence on the surrounding areas. Thus, the City of Alba Iulia represents an important implementation element of the different development policies at county and regional levels. The geographic location and its polyfunctional structure ensures that Alba Iulia has the necessary premises for the development of a strong interdependency relations with the adjacent areas, urban as well as rural.

In spatial development, one must foremost take into account the demand and offer relationship, this being the starting point for planning urban spatial development. A series of measures were created to attain said goal:

- the development of a connective infrastructure that will allow dynamic areas to increase their demographic and building mass; the role connective infrastructure is to link people and opportunities;
- the extension of Alba Iulia capacity to satisfy the needs of the Area of Influence;
- a good correlation between the city's economic base and the resources found nearby;
- encouraging economic density and urbanisation (efficient territorial development);
- increasing the gravitational attraction (demographic, economic etc.) of Alba Iulia will lead to the extension of its Area of Influence, contributing to indirect growth (increasing the degree of connectivity, competitiveness, policentricity etc.);
- the increase of demographic mass can be achieved by extending the public utility infrastructure (especially the increase of population in periurban or suburban, areas that are now ruralised);
- the cities innovation capacity depends on a strong connection between local authorities, businesses and researchers which can lead to sustainable solutions;
- investment in quality of life to ease the attraction of people to the area;
- encouraging urbanisation and facilitating the mobility of those who leave in the area, thus enabling the same quality of life;
- replacing the classical partnership (public-private) with new types of partnership;
- integration of marginalized communities; like many other Romanian cities, Alba Iulia has large marginalized communities that reside in the city centre (for instance Gypsies).

5.8. Development policies at Alba Iulia and its component settlements level

The spatial development objectives of Alba Iulia are (according to Alba Iulia General Urban Plan GUP from 2014):

- Alba Iulia as *The Symbol Capital of Romania* and centre of regional and county importance;
- the complex development the city's relations with its immediate Area of Influence;
- a coherent adaptation to the current configuration of the functional and image demands brought by the new types of dynamic activities;
- improving the quality of the urban framework and bringing it to European levels;
- protecting and capitalizing the built and natural heritage.

The first two strategic objectives for spatial development have an offensive character, intended to bring the territory/locality forward in the current regional competition, while the following three are more balanced, intended to reduce disfunctions and avoid creating new ones. These objectives are found in the General Urban Plan and the Local Planning Rulebook as clear stipulations:

- identification of new functions - amplitude, functional demands, spatial configuration and significant value, interrelations, urbanistic indicators;
- insuring favourable conditions for locating new institutions and public utilities;
- insuring the quality of living based on European parameters and insuring a social and technical infrastructure;
- maintaining property values for all inhabitants
- reduction / eliminating disfunctions;
- capitalizing the built heritage and protecting its values;
- landscape and environmental protection;
- emphasizing priorities for the General Urban Plan's period of validity;
- creating favourable premises for efficient management;
- extending the role of Alba Iulia as regional pole for the entire periurban area, by distributing activities according to local potential and by rehabilitating transport and communication networks.
- the development of Alba Iulia as a regional and national service, business, culture, communication, media and higher education center.

6. CONCLUSIONS AND RECOMMENDATIONS

Development policies have an important role to play in solving existing disfunctions in a dynamic, pulsating territory, such as urban Area of Influences. The proposal of the strategic framework must be adapted by the requirements arising from the existing territorial disfunctions. Without collaboration across institutions, the materialisation of all those solutions is almost impossible, leading to low resilience and an ever increasing economic and social fragility. The holarchic approach of the strategic framework related to the Area of Influence was a mandatory endeavour in order to emphasize top-down development strategies for all territorial cuts (from NTP to Alba Iulia GUP). Completing this extensive presentation regarding the strategic framework is an informative and operational support for the relevant institutions whose role is to insure a proper spatial governance. The creation of a legislative basis for urban Area of Influences is a must. These territorial structures are frequently included and / or analysed

from the legislative perspective of metropolitan areas. The question is how to proceed when we deal with the analysis of an Area of Influence of an urban center that acts as pivot point and has a low spatial polarisation? Alba Iulia area of influence comprises many territorial cuts that overlap spatially as well as institutionally.

ACKNOWLEDGEMENTS

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THE CHARACTERISTICS OF THE HABITAT COMPONENT OF MUREȘ DEFILE

G. B. TOFAN¹

ABSTRACT. – **The Characteristics of the Habitat Component of Mureș Defile.** The habitat component of Mureș Defile is almost entirely rural, consisting of 11 rural settlements grouped in three communes, and the village of Bistra Mureșului (Deda commune), and Văgani, part of Toplița Town, which is actually a rural settlement. This analysis is mainly concentrated on the three communes (Stânceni, Lunca Bradului and Răstolița), starting with the setting up of a settlement hierarchy for the localities that make up the regional microsystem of Mureș Defile, represented by two systems (Toplița and Reghin), which in turn have their own subsystems (Stânceni and Lunca Bradului for Toplița, and Răstolița and Deda for Reghin), which enabled the identification of specific typologies for this area. In terms of the numerical evolution and housing dynamics of the area, of the last decades, there is a slight increase in the number of houses, which was not caused by population growth, but by the population needs and the increase in comfort requirements, as well as by higher incomes, in some situations, due to the migration of a relatively small population segment abroad, for work.

Keywords: *buildings, settlements built-up areas, typologies, rental fund, households.*

1. INTRODUCTION

This study is a continuation of the study concerning the geodemographic characteristics (the evolution of the number of inhabitants, population distribution and population structure) of Mureș Defile, written by G. B. Tofan in 2014. The settlement network was strongly influenced by the elements of the natural framework (relief, hydrography, topoclimate, forested areas and swamps, etc.), human communities adapting their habitats according to the above mentioned elements, which led, in time, to a strong and permanent correlation between the settlement territorial organisation and its built-up area.

Similarly to the adjacent areas, this territory was and still has a civilisation influenced by the existence of forests, a fact reflected in the constructions and architecture of the area. The settlements' origins and their development are firmly based in the existing natural, historical and economic factors, the most prominent being social-economic, more exactly the existence of large tracts of forests, which led to the development of logging industries, also facilitated by Mureș River, which allowed the growth of the most intensive

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industrial rafting operations in Romania (L. Someșan, 1938). To this, one can add the hayfields and the pastures that favoured animal husbandry, which is a secondary activity for the people living in the area.

The archaeological sites are almost nonexistent across the defile. In Neagra village, a 9th century ceramic bowl was uncovered, presumably belonging to a population on the move, as this area was covered by large forests, but at the same time these areas could have harboured smaller groups, who later might have established the existing settlements.

The Roman road, not marked by ancient itineraries, followed Mureș Valley, and was identified as starting from Deda all the way to Scaun Peak (Scaunul Domnului).

The rurality of this microsystem is proven by its structure, comprising several villages acting as commune seats (three villages) and other smaller villages, hierarchically structured and characterised by relations of interdependence with one another.

Therefore, from East to West, one mentions *Stânceni Commune* with the villages of Ciobotani, Stânceni and Meștera, then *Lunca Bradului Commune* with the villages of Neagra, Lunca Bradului and Sălard, followed by *Răstolița* with Andreneasa, Răstolița, Iod, Borzia and Gălăoaia, then the village of Bistra Mureșului, part of *Deda*.

As for urban areas, beginning with 1956, Vâgani is part of Toplița Town, but it has a rural population from economic and social points of view.

Returning to the hierarchical structure of Toplița-Deda regional microsystem, one can observe that many current villages were hamlets belonging to different villages nearby, until 1956. For example, Ciobotani village, a hamlet that belonged to Toplița, was declared a village on 10th January 1956, belonging to Stânceni Commune, followed by Meștera and Neagra, former hamlets of Stânceni, separately registered and declared villages in 1956, the former being included in Stânceni Commune, while the latter to Lunca Bradului Commune.

On the same year (1956), Sălard was declared a village, part of Lunca Bradului (former hamlet of Lunca Bradului), Andreneasa was a hamlet of Lunca Bradului in 1910, while in 1956 it became a village, part of Răstolița Commune, Iod and Borzia, hamlets of Filea, Deda Commune (in 1910), both became villages of Răstolița in 1956; Gălăoaia, hamlet of Răstolița, was declared a village belonging to Răstolița in 1956. Răstolița and Bistra Mureșului received village status in 1956, the first one as part of Răstolița Commune and the second one included in Deda Commune.

From a hierarchical standpoint, we have two tiers of settlements, represented by commune seats (Stânceni, Lunca Bradului, Răstolița, and partially Deda) and villages proper (Ciobotani, Stânceni, Meștera, Neagra, Lunca Bradului, Sălard, Andreneasa, Răstolița, Iod, Borzia, Gălăoaia and Bistra Mureșului), plus Vâgani, part of Toplița, which, according to its typology, can be considered a level IV settlement. The entire settlement network has undeniable connections with the “outside”, East with Giurgeu inner mountain depression, and West with the Transylvanian Depression (V. Mara, Daniela Mara, 2004).

Due to this outward polarisation, in conjunction with a series of factors like *distance, habitat, economic and administrative aspects*, two systems were outlined, each with several subsystems, identified at regional level with county seats (Miercurea-Ciuc for Harghita County and Târgu-Mureș for Mureș County), followed by two zonal centres

(second tier). The first one is *Toplița*, which polarizes the eastern part of the defile, from Vâgani to Lunca Bradului, as these settlements are closer to this urban centre than to Reghin, even though Toplița is part of another county (Harghita). The second one is *Reghin* that polarizes the western part, including Răstolița and Deda subsystems, with a high percentage of active population working in the secondary and tertiary sectors of Reghin.

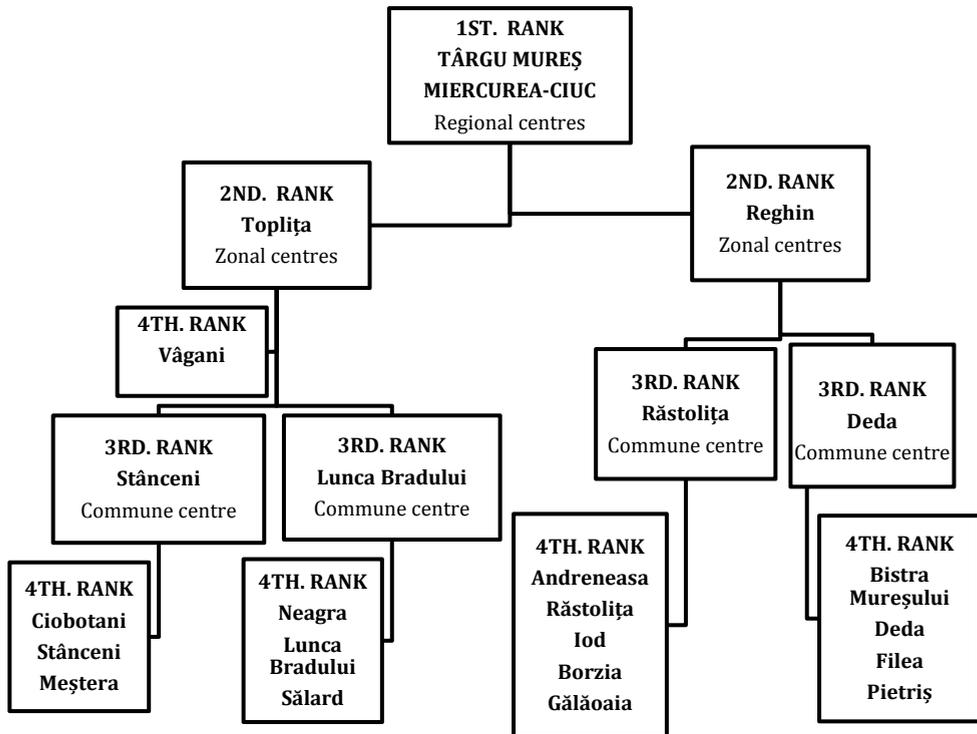


Fig. 1. The ranking of polarising centres for the population of Mureș Defile.

2. THE EVOLUTION OF THE ADMINISTRATIVE ORGANISATION

An important role in the establishment of the settlements' administrative limits was played by the physical-geographic factors (mainly the terrain configuration), but also by other factors, such as demography, politics, the economy, etc.

After the 1848 revolution, the Habsburgs introduced a military-administrative organization under the name of „*military districts*”, divided in circles run by circle commissars. In 1850, the settlements at hand belonged to *Gurghiu Circumscription*, *Pietriș Circle*, *Reteag Military District*, followed by the formation of civil administrative circles comprised of prefectures, for the entire Transilvania, divided in districts, which means that in 1900, Stânceni, Lunca Bradului, Răstolița belonged to *Mureș-Turda County*, *Reghin de Sus District*.

At the 1930 census, Mureş County (Târgu-Mureş as a seat) was an administrative unit, part of the Kingdom of Romania, composed of seven districts: *Band*, *Miercurea Nirajului*, *Mureş* (later divided into *Mureş de Sus* and *Mureş de Jos*), *Râciu*, *Teaca*, *Reghin*, (*Reghin de Sus*, including *Bistra Mureşului* and *Reghin de Jos*), *Gurghiu* and *Topliţa*, encompassing ten settlements: *Bilbor*, *Borsec*, *Corbu*, *Gălăuţaş*, *Sârmaş*, *Subcetate*, *Topliţa*, *Stânceni*, *Lunca Bradului* and *Răstoliţa*.

Another change became evident at the 1956 census, when the counties were changed into regions. The settlements under discussion were included in *the Hungarian Autonomous Region, Topliţa District*. The same year, the hamlet of Vâgani became a component of Topliţa. Beginning with the month of February 1968, due to the law adopted by the Grand National Assembly, the administrative-territorial division based on counties was reinstated (it is still in effect today). Vâgani became part of the actual town of Topliţa, Harghita County, while Stânceni, Lunca Bradului and Răstoliţa communes became part of Mureş County. In 1998, with the establishment of development regions (The Green Charter of Regional Development in Romania, 1998), this territory was integrated in the Centre Development Region – with the seat in Alba-Iulia.

3. RURAL SETTLEMENTS TYPOLOGY

There are three essential components in the establishment of structural typologies and models for rural settlements (population, built-up area and territory), as well as a series of geographical factors (terrain configuration, topoclimate, hydrography, vegetation, pedology etc), and social-economic ones (population dynamics and evolution, demographic structures, economic activities, administrative-territorial organization), that have different influences during the evolution of the territorial microsystem.

Therefore, rural settlements of the area can be defined and quantified, through a series of geographic indicators, such as: *population density within the built-up area*, *spatial distribution*, *built-up area shape, size and structure*, *residential area*, *architectural specificities of the elementary habitat (household)*.

For a better knowledge of settlement physiognomy and especially its structure, we use the indicator that expresses *population density within the built-up area*, in order to emphasize the level of population concentration within the built-up area, as well as building concentration.

After analysing the values of built-up area surfaces from the analysed territory, one can observe the fact that some have very large built-up areas, more than 400 ha, such as Stânceni (496.1 ha) and Lunca Bradului (455.3 ha), while Răstoliţa, with an administrative territory of 26598 ha, has a built up area of just 127 ha. In 2011, there were extremely different population densities within the built-up area: 16.1 inhabitants/ha in Răstoliţa, 4.3 inhabitants/ha in Lunca Bradului and 2.8 inhabitants/ha in Stânceni.

The spatial distribution of rural settlements was analysed by studying two main aspects: quantitative distribution and morphological distribution. The former can be calculated using several indicators: *settlement density*, *settlement areality coefficient*, *average distance between settlements*, *dispersion index*, *concentration index*, etc.

The administrative territory belonging to the rural settlements of Stânceni, Lunca Bradului and Răstoliţa basins cover 720.8 km² altogether.

The calculated average density for the entire rural administrative territory is 0.4 settlements/100 km², due to the presence of mountain areas, a value that is considerably lower than the national average (5.5 settlements/100 km²).

The highest density is registered in Stânceni (administrative surface of 124.56 km² and three settlements), with 2.4 settlements/100 km², followed by Răstolița (265.98 km² and five settlements), with 1.8 settlements/100 km² and Lunca Bradului (330.32 km² and three settlements), with 0.9 settlements/100 km².

The *areality coefficient* registers a value of 240.2 km²/settlement, considerably higher than the national average (18.1 km²/settlement), as the administrative surface of each commune is very large in comparison to the number of villages included. Thus we have the following situation: Lunca Bradului (110.1 km²/settlement), Răstolița (53.2 km²/settlement) and Stânceni (41.5 km²/settlement).

The *average distance between two settlements* for the area of Stânceni-Lunca Bradului-Răstolița, calculated based on the above mentioned coefficient, has a value of 18.6 km, higher than the national level (5.1 km). There are higher values for Lunca Bradului (12.6 km) and Răstolița (8.7 km).

In order to find the degree of people grouping in settlement built-up areas, one can apply *the dispersion index method*. Analysing the values of the dispersion index for administrative units gives us a view of a not so spectacular evolution, commune centres having a more considerable demographic potential than the encompassing villages.

There are values over the 1.0 threshold found in Răstolița, 1.3 in four villages, and Stânceni with 1.0 with two villages, while Lunca Bradului is below 1.0 (0.5 with two villages).

The pull exerted by the centre - commune seat for each administrative unit can be found using the indicator called *communal centres polarizing potential*, having a general value of eight inhabitants/settlement, the largest value being found in the commune with most villages (Răstolița, four inhabitants/settlement).

The basins that make up this alignment decrease in altitude from east to west, settlements built-up areas being found between 500-700 m (Stânceni, 680 m, Răstolița, 530 m and Lunca Bradului 524 m), as the largest built-up surfaces are found on meadows and terraces, belonging to Mureș and its main tributaries.

Most settlements have an *irregular shape*, which indicates a spontaneous land occupation, spreading progressively during different historic periods, along Mureș River and the main communication routes especially the main lines, with linear settlement cores (Ciobotani, Meștera, Neagra). There are built-up areas with a *simple linear texture* (Ciobotani, Meștera, Neagra, Andrenea) and *linear-tentacular*, along the valleys and the main road (Stânceni, Lunca Bradului, Răstolița and Bistra Mureșului).

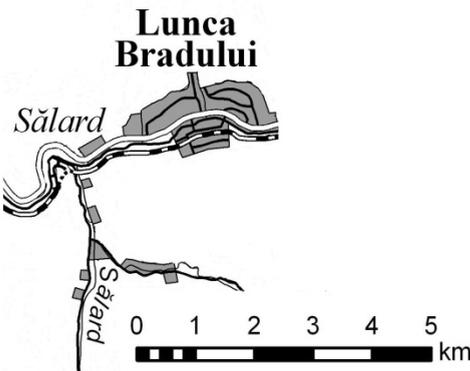


Fig. 2. Lunca Bradului-a commune with a linear-tentacular texture, following valleys and the main road.

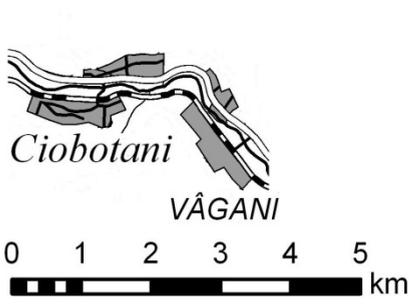


Fig. 3. Vâgani and Ciobotani-settlements displaying a simple linear texture, along the main road.

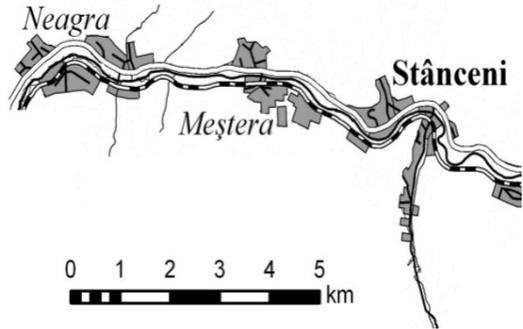


Fig. 4. Stânceni- a village with a linear-tentacular texture, developed along valleys and the main road; Meștera, Neagra – villages with a simple linear texture, along the main road.

In accordance to the terrain characteristics, most rural settlements along the defile have a *gathered-elongated shape*, with households on both sides of the main road (E 578) and Mureș River, as well as a *scattered-elongated one*, the built-up areas being positioned along secondary valleys (Gudea Valley, Sălard, Bistra).

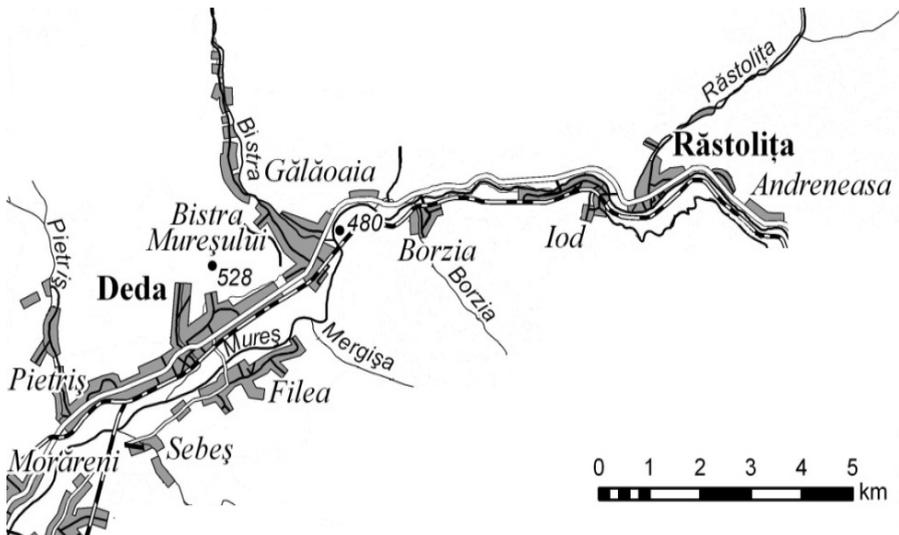


Fig. 5. Răstolița, Bistra Mureșului- villages with a linear-tentacular texture, developed along valleys and the main road.

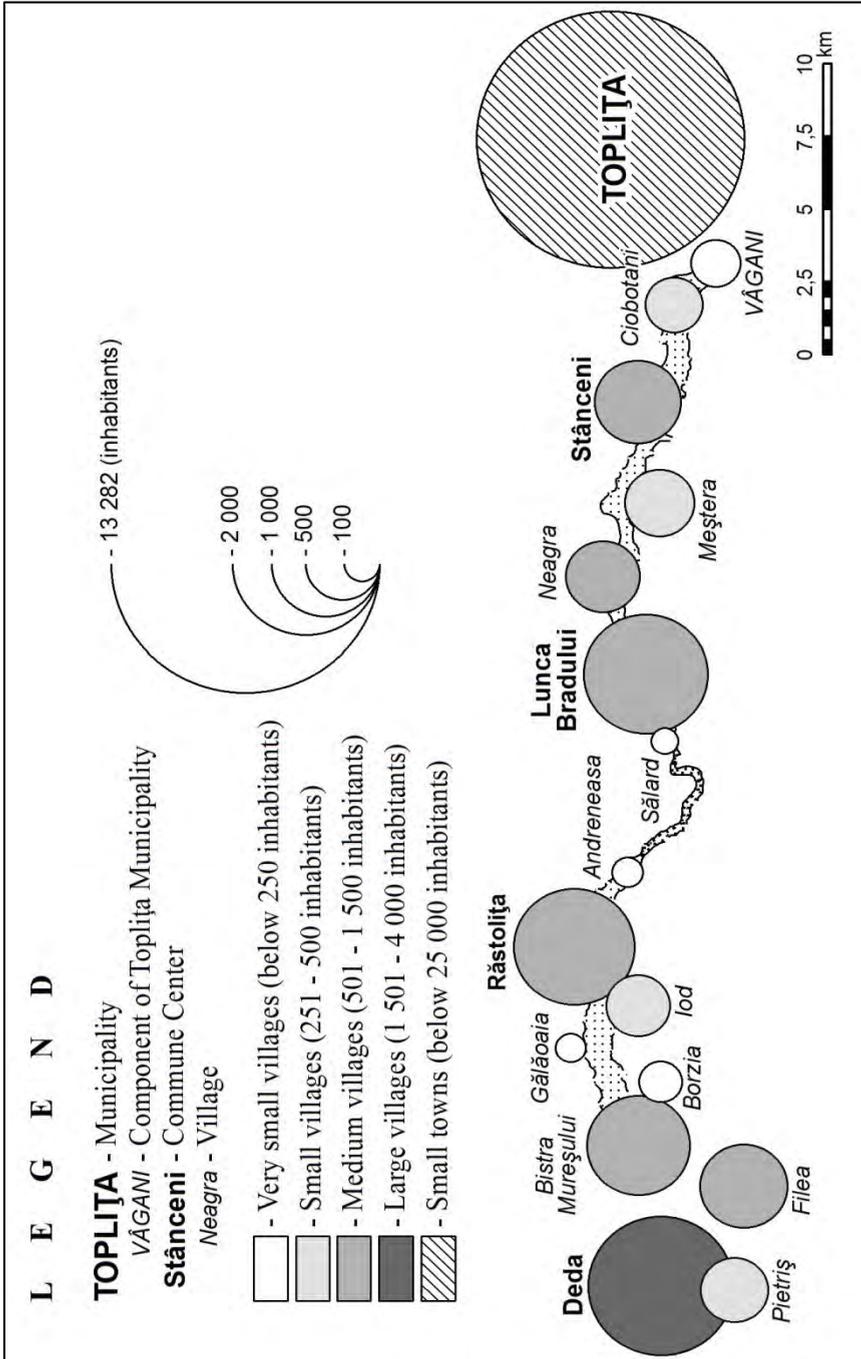


Fig. 6. The demographic size of the settlements of Mureș Defile, 2011.

According to the data from the 2011 census, in terms of *demographic size*, Stânceni, Lunca Bradului and Răstolița communes, together with Bistra Mureșului, that belongs to Deda, have 6455 inhabitants, and can be grouped into four categories: *very small rural settlements* (under 250 inhabitants), which includes four settlements: Sălard (66 inhabitants), Andreneasa (87 inhabitants), Gălăoia (81 inhabitants) and Borzia (169 inhabitants), concentrating 6.3% of the population; *small rural settlements* (251-500 inhabitants), such as Ciobotani (305 inhabitants), Meștera (443 inhabitants) and Iod (374 inhabitants), representing 17.3% of the defile population and *medium rural settlements* (501 - 1500 inhabitants) as the villages of Neagra (504 inhabitants), Stânceni (682 inhabitants), Bistra Mureșului (980 inhabitants), Răstolița (1342 inhabitants) and Lunca Bradului (1422 inhabitants), 76.4% of the total rural population of the defile.

In terms of *rural economic activities*, one can observe that all settlements have an *agricultural function*, mainly animal husbandry and logging, but taking into account a series of aspects (like predominant activities, land use), there are two functional types: *animal husbandry-logging settlements* (Ciobotani, Meștera, Neagra, Lunca Bradului, Sălard, Andreneasa, Iod, Borzia, Gălăoia) and *settlements with mixed agricultural-industrial functions* (Stânceni, Răstolița).

In terms of *habitation time* within the year, the rural settlements of the area fall under two categories: *temporary households* (tourism, forestry and hunting lodges, permanent or mobile sheepcotes, „odăi” - small houses, huts), situated far from commune centres, used by locals especially in summer, during mowing, and in autumn, when the herds return from the surrounding mountains, and more developed *permanent settlements*, such as hamlets and villages.

4. THE HABITATIONAL FUND

This component can be analysed through a series of indicators like: *total number of buildings according to their construction period, number of households, number of permanent and seasonal households, type of ownership, the endowment level, construction permits per type of buildings* etc.

Regarding the total number of buildings, according to their construction period, one might observe that constructions built before 1990 do not basically exist anymore (two buildings in Bistra Mureșului, three in Lunca Bradului and one in Răstolița). Between 1900 and 1944, due to the economic progress boosted by the development of logging and industrial rafting, and also by the communication infrastructure (railway and road network), there was a rapid population increase in the area, leading to the creation of large logging centres (Lunca Bradului, Stânceni, Răstolița, Bistra Mureșului).

Until 1990, there was a roughly uniform development in terms of constructions, but during 1992-2002 period, in Lunca Bradului, due to the existence of the Logging and Transport Enterprise, a boom was experienced, with 436 buildings.

At the 2011 census, in the three analysed communes, a total of 3 025 buildings were registered, as follows: Lunca Bradului (1 177 buildings), Răstolița (1 041 buildings) and Stânceni (807 buildings).

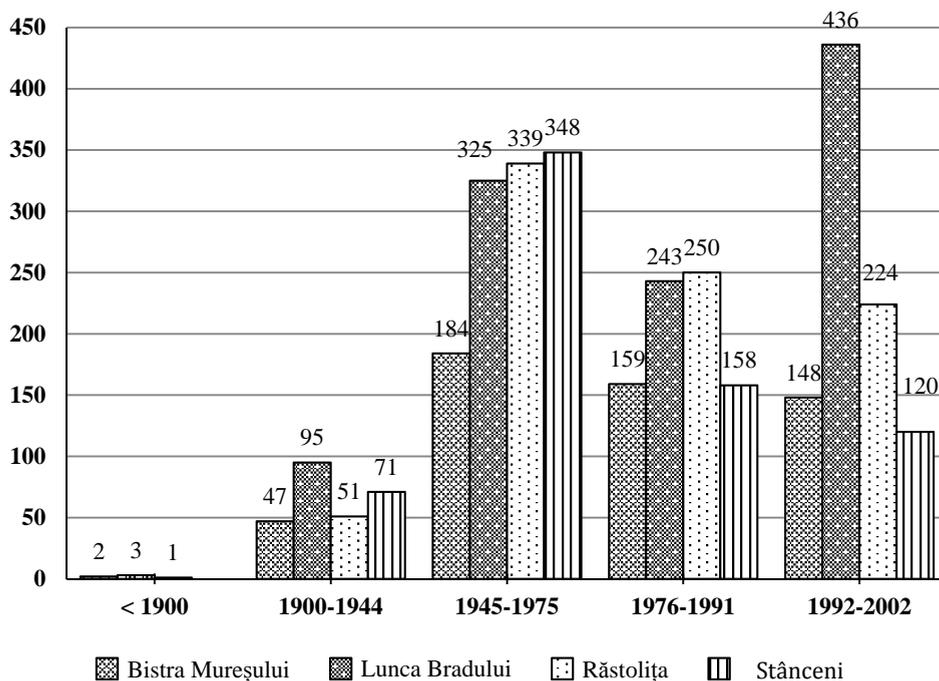


Fig. 7. The total number of buildings, according to construction period, in Mureș Defile.

Regarding the second aspect to be presented, *the number of households*, the statistical data from the last censuses show a slight increase by 0.3% in 2011 compared to 2002 (2038 households in 2002 and 2044 in 2011). However, there is a different situation at commune level, as the number of households dropped in Lunca Bradului from 770 in 2002 to 726 in 2011, while Răstolița witnessed an increase from 712 households in 2002 to 768 in 2011.

The agricultural surface/household, in 2011, has values between 6.5-8.1 ha/household, while the *arable surface/household* registers low values, due to a reduced extent of arable lands, only 0.06 ha/household in Răstolița, from a 50 ha arable surface, 0.1 ha/household in Lunca Bradului, from 80 ha and 0.2 ha/household in Stânceni, from 138 ha.

For the population of Toplița-DedaDefile, forests have always been an important source of income, in some periods being their only means of survival.

Houses and animal shelters are exclusively made of wood, their heating being provided by stoves using wood. In terms of *forest area/household*, the microregional average is 26.1 ha/household, while, at administrative level, the highest values can be found in Lunca Bradului commune (33.7 ha/household, with 24456 ha forest), followed by Răstolița (26.5 ha/household, with 20 364 ha forest) and Stânceni with just 15.5 ha/household, out of 8 568 ha).

In terms of *demographic size*, most households are composed of 2-3 members, the average, according to the 2011 census, being 2.6 people/household, a decrease compared to 2002 (3.0 people/household), at administrative level, slightly higher values being found only in Lunca Bradului (2.74 people/household). In terms of the *component spatial association pattern*, the defile is characterized by households with detached components, with one or two living quarters, the main building having its front in the street, while the smaller building, used mostly during summer, being found in the back. The buildings for agriculture and other destinations are also in the back, and comprise a large building, with a cattle and sheep barn, pig sties and bird enclosures and spaces for hay. Courtyards are usually large, the nonfunctional spaces taking, in most cases, almost half the surface of the courtyard, spaces of recreation being uncharacteristic.

Living quarters, the essential component of settlement built-up areas from a functional as well as physiognomic point of view, built mainly from wood and only later from brick and cellular concrete, increased from 2591 in 1992 to 3455 in 2011, the highest growth rate being registered in Lunca Bradului commune (1130 existing quarters at the end of 1992 and 1459 in 2011). In 2002, out of total of 3 272 living quarters, with 7538 rooms (127473 m²), 2018 were permanent, with 4458 rooms (75700 m²) and 1254 were seasonal, with 3080 rooms (51 773 m²).

In 2011, out of total of 3 455 living quarters registered in the three communes, there was an increase in the number of privately owned houses from 91.6% in 2002 to 94.4% in 2011, while group private properties decreased from 4.0% in 2002 to 3.6% in 2011, a similar process found in the case of state owned properties - from 3.8% to 1.8%, and properties of religious entities from 0.6% in 2002 to 0.08% in 2011. There were also two living quarters that were cooperatively owned (one) and associatively owned (one), in Răstolița, in 2011.

When it comes to the *endowment level of conventional households with installations and outbuildings*, following the natural tendency of household increase, the last decade witnessed an ascending trend of houses with superior endowments, such as: 58.0% have running water and sewage system, either public or private, 51.5% have bathrooms, 98.1% have electricity, while the number of houses with their own heating systems increased (from 1.3% in 2002 to 8.6% in 2011) and more than 80% have a kitchen, either inside or outside the house.

Another two important indicators for the analysis of Mureș Defile's housing infrastructure (in 2011) are the *livable surface area/household*, small living quarters being the ones that predominate, with values between 38.3 and 41.0 m²/household, and *livable surface area/inhabitant*, between 22.2 and 30.0 m²/household.

An increase was observed in the number of construction permits, but there are many constructions that have been erected illegally, without any permit, the situation in 2011, at administrative level, being the following: 18 permits were issued for residential buildings, meaning 855 m² of usable surface in Stânceni and 980 m² usable surface in Răstolița. Three permits were issued for Lunca Bradului, with a usable surface of 286 m², and one permit for other types of buildings in Lunca Bradului (127 m²) and one in Răstolița (925 m²).

THE CHARACTERISTICS OF THE HABITAT COMPONENT OF MUREȘ DEFILE

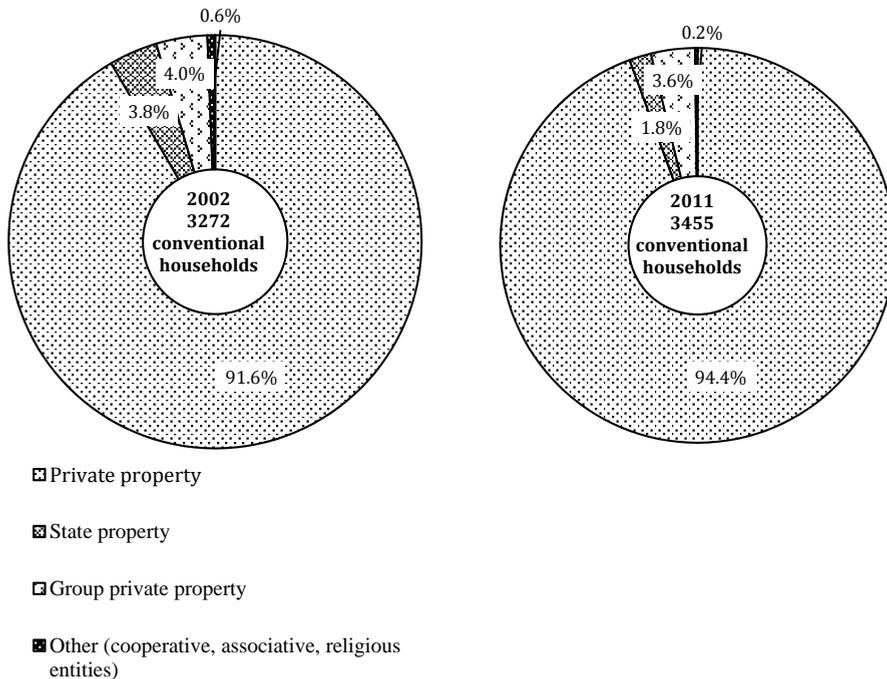


Fig. 8. Conventional housing by type of property, in 2002 and 2011, in Mureș Defile.

5. CONCLUSIONS

By quantifying a set of synthetic indicators, we were able to present the characteristics of Mureș Defile habitat, from three communes (Stânceni, Lunca Bradului and Răstolița), emphasizing the following aspects: population density within the built-up area varies considerably, due to large built-up areas, over 400 ha, in Stânceni and Lunca Bradului; settlement density for the entire administrative area being 0.4 settlements / 100 km², with a 240.0 km²/settlement areality coefficient, caused by the large administrative area of each commune compared to the number of villages; the average distance between two settlements being 18.6 km, with an average dispersion index of 1.0-1.3 and a polarizing potential of 8 inhabitants/settlement. In terms of built-up area shape, there are irregular, linear shapes being found in Ciobotani, Meștera, Neagra, Andreneasa villages, while textures can either be simple linear or linear-tentacular ones. From a demographic standpoint, there are no large rural settlements, over 70% of the total rural population being concentrated in average sized settlements, with a population between 501- 1500 inhabitants (Neagra, Stânceni, Bistra Mureșului, Răstolița and Lunca Bradului), that, functionally, fit in the category of animal husbandry-logging settlements and mixed agricultural-industrial settlements. In terms of housing, there is a general ascending trend due to an increased demand for housing and comfort.

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DIFFICULTIES OF THE TOURISM DEVELOPMENT IN THE MIDDLE TISZA (TISA) REGION, HUNGARY

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ABSTRACT. – Difficulties of the Tourism Development in the Middle Tisza (Tisa) Region, Hungary. In this paper the water-based tourism characteristics of Eastern Hungary are studied, mainly concerning the tourism development problems (deriving mainly from the administrative borders) of Lake Tisza in the Middle Tisza (Tisa) region. The fragmentation into planning-statistical and tourism regions, counties, townships, and the recovery of the geographical area demanding special development are not smooth. The development potential of the tourism characteristics of Lake Tisza is now unexploited; the low price-quality ratio makes the region attractive in terms of tourism. The area is an internal periphery on the map of Hungary. Its peripheral location was also disadvantageous concerning the EU tender allocation since it could not make the best of those possibilities the borderline settlements could (e. g. HURO tenders). The tourism statistics of the region were improved due to the available developments supported by the European Union between 2007 and 2013. However, it remains the last region among the tourism regions of Hungary.

In this paper suggestions for eliminating the difficulties are offered to facilitate the catching-up of the Lake Tisza region, but this is detained by social problems such as the high percentage of Romany people or migration.

Keywords: *tourism, development, appraisal problem, EU support, Lake Tisza (Tisa), Hungary*

1. INTRODUCTION

There are two factors that seem essential in the economic stimulation for the states of the European Union (especially for those waiting for economic adjustment). The first one is the increased presence, the independent production, and the multiplier effects of the tourism in the national economy categories of the countries, these factors increase the value of GDP. Based on the estimations, 10% of the GDP derive from the tourism. Concerning the production and the income generation, the tourism multipliers are higher than the social multipliers; therefore tourism should be highlighted in every national economic strategy where the main purpose is the production and the increase of income. The production and income effects of tourism are significantly high comparing to other export industrial activities (Economic Research Co. -Internet 1). The other factor

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is ensured by the European Union since there is a development and support system for its member states that significantly facilitates the catching-up of the different regions. This mainly depends on the decision-maker organisations and development policy of the countries.

It is typical that the countries are divided into smaller geographical regions in the inner areas (counties, regions, divisions). Several researchers have studied territorial demarcation. Examining the economic spaces Dicken (2003) created three levels: regional/local, national and supranational. Based on social activities, Nemes Nagy (1998) created four levels: micro, local, regional and macro. The typical organisation characteristics of the territorial units were highlighted previously by Korompai (1995). He described local, regional, national and international levels. The organisation is either economic, competitive or other, the processes in it and the effects of the society represent the territorial units. Studies show that each territorial unit derives from three main social characteristics (independently of the number of levels): ideological (cultural, linguistic identity); political-legal; economic.

In order to reach the EU support, countries should create territorial units that are suitable for the harmonization of the different divisions. The territorial units in the European Union i. e. NUTS (Nomenclature of Territorial Units for Statistics) levels were created based on political-legal characteristics. The harmonization of the former territorial units with the NUTS levels depended on the approach of the countries. In Hungary the levels are: NUTS I. - country, NUTS II. - region, NUTS III. - county, NUTS IV. - subregion (townships from 2013), NUTS V. - settlement. The borders of regions are set to the borders of the former counties. They exist from the middle of the 1990s since Hungary endeavoured to prepare for the accession to the EU. In Hungary, after the creation of the planning-statistical units, the tourism regions were also created based on these units.

In this paper development problems deriving from the planning-statistical and tourism demarcation are presented studying a chosen tourism destination, Lake Tisza (Tisa), as an example. It is important to highlight how the decision-making mechanism can detain the development of a region. Examining the actual problems solutions are offered how the existing economic-social development processes can be modified favourably.

2. MATERIALS AND METHODS

The most significant tourist attractions of Hungary are water-based due to the rich surface and underground water resources. In Eastern Hungary surface water resources consist of the River Tisza (Tisa), its subsidiaries and the related irrigation canals and lakes. Concerning underground water resources Hungary is the richest country in Europe. Thermal waters with temperatures above 30°C can be found in 80% of the country (Alföldi, 2011). The thermal water resources provide the basis for medical and health tourism supply. Besides the Great Hungarian Plain (Debrecen, Hajdúszoboszló, Gyopárosfürdő, Berekfürdő, Gyula) there are spas in the Buda Mountains and the Transdanubian Hills e. g. Hévíz, Zalakaros, Bükfürdő. Many settlements have spas; for example Thermal-Health Industrial Cluster Association has 33 registered spa members in the Northern Great Hungarian Plain.

Surface and underground waters can also indirectly affect tourism. Thus, not only the fishing and sport tourism or the waterside recreation, and the medical and health tourism related to the thermal water resources are offered.

River Tisza (Tisa) is the largest river in Eastern Hungary; it is formed by the junction of headwaters White Tisza (Tisa) and Black Tisza (Tisa). The length of the river is 1260 km (Alföldi, 2011). The river has 3 main reaches: from the source to the estuary of the River Szamos (Someş) it is called Upper Tisza (Tisa), from this to the estuary of the River Maros (Mureş) it is the Middle Tisza (Tisa), and the last one is the Lower Tisza (Tisa) that ends at the junction with the River Danube. The whole reach of the Middle Tisza (Tisa) is in Hungary and it can also be divided into 3 different reaches (the naming is the same as mentioned above). The Upper Tisza (Tisa) is situated between the northern Hungarian border and Tokaj, the Middle Tisza (Tisa) is between Tokaj and Tiszaug, and the Lower Tisza (Tisa) reach can be found between Tiszaug and the southern border of the country. The Middle Tisza (Tisa) region includes the middle part of the Hungarian reach of the River Tisza (Tisa). According to the Hungarian landscape classification, it is a meso-region. It belongs to the macroregion of the Great Hungarian Plain, includes 8 microregions within 3 microregion groups (Middle Tisza floodplain, Nagykunság and Hortobágy, see Fig. 2). In this paper the Lake Tisza tourism region situated in the Middle Tisza (Tisa) region is studied, focusing on the tourism of the lakeside settlements (Fig. 3).



Fig. 1. The Hungarian reach of the Middle Tisza (Tisa) region.

Source: Own editing

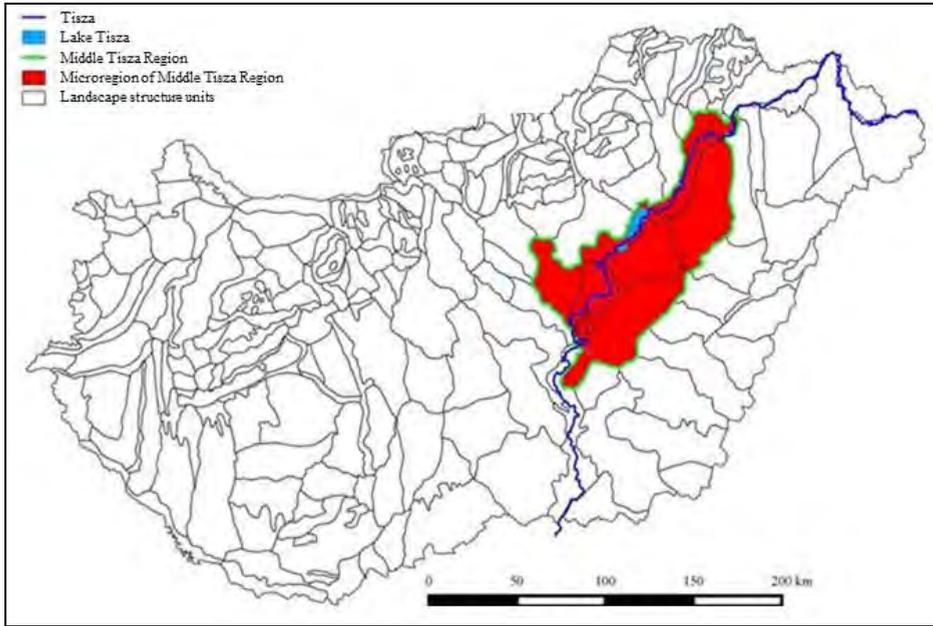


Fig. 2. The landscape geographic representation of the Middle Tisza (Tisa) region.
Source: Own editing

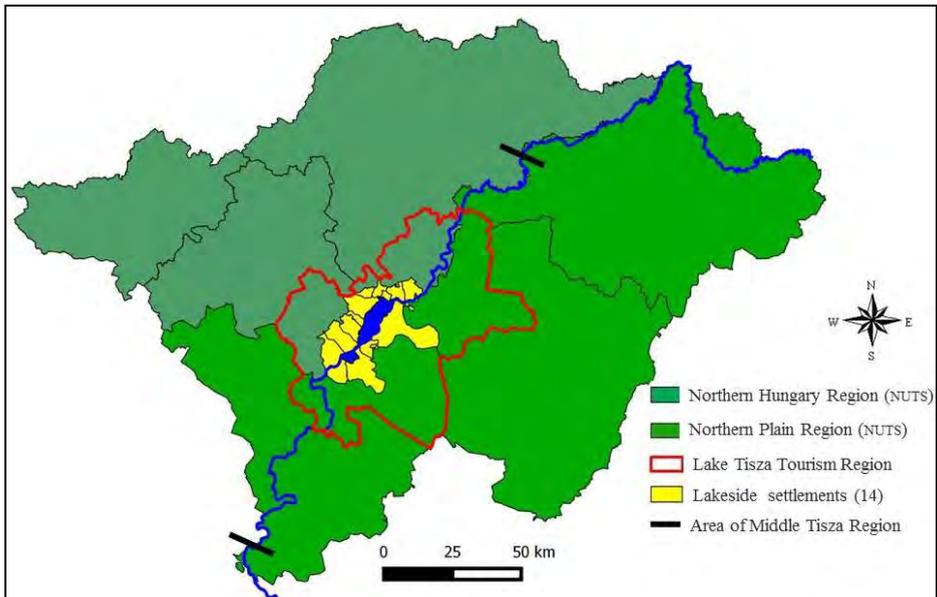


Fig. 3. The studied area.
Source: Own editing

During the secondary study, international and national special literature was examined specifically of the topic. Libraries, journal collections and internet databases were studied such as the data of Hungarian Central Statistical Office (KSH), National Region Development and Spatial Planning Information System (TeIR), National Development Agency (NFÜ), European Travel Commission (TourMIS). 3 databases were prepared using the collected data. The first one comprises of statistical data (KSH, TeIR), the second is about the parameters of the development tenders that are available through the National Development Agency, and the last database includes the primer data deriving from the independent study.

A field study of the settlements and the geographic characteristics of the Middle Tisza (Tisa) region was performed in order to self-experience the characteristics of the area.

3. RESULTS AND DISCUSSION

3.1. The physical geography of the Middle Tisza (Tisa) region

In the Pleistocene the surface of the region was formed by the rivers of the North Hungarian Mountains then the River Tisza (Tisa). Among the natural and artificial oxbow lakes (Szartos oxbow lake, Dead Tisza (Tisa) near Csapó, Dead Tisza (Tisa) near Füred) there were soft-wood parks, gallery forests, but orchards and ploughlands could also be found. The floods of the River Tisza (Tisa) always prevented the intense economic usage of the active floodplain, thus the area was considerably rich of species, which makes it outstanding among the similar habitats of the Middle Tisza (Tisa) region. Here the unique, water-affected ecological systems of the Tisza (Tisa) valley remained in the largest diversity.

From the 19th century flood control and river regulations started in the landscape formed by the rivers (in favour of agricultural usage). There were oxbow lakes, abandoned river beds and brooks in the alternating width of the active floodplain between the dams, and between the Little Tisza (Tisa) and the River Tisza (Tisa) in the first half of the 20th century. A recent significant change was the construction of the barrage near Kisköre started in 1967, but finished only in 1973 since the damming of the water occurred in different times due to the dam built as part of the works. Regarding the construction of the dam, several determinant aspects were considered such as ensuring the sufficient water quantity for the watering of the drought areas in the Middle Tisza (Tisa) region, the flood regulations, the improvement of the navigability of the River Tisza (Tisa) as well as the development of energy production and tourism.

Lake Tiszais the second largest and also the youngest lake in Hungary. The first step of the formation of the planned open water surface was the exploitation of the forests. However, this work could not have been finished in time; therefore the transportation of the fallen trunks was not handled (Gál et al., 2006). The single remained hardwood park is the Tiszaád forest. The damming of the reservoir was originally planned at 850 cm water level, but only the second damming schedule was realized, thus the maximum of 725+5 cm water level (Fejes, 2011) was determined to satisfy the water demand and the maintaining of the water basis and water reserve since 1978. Due to the cancellation of the third damming schedule most of the higher areas (23 km², mostly point bars) remained dry and appear as islands and peninsulas.

Lake Tisza actually would not have inner flow in the area between the River Tisza (Tisa) and Little Tisza (Tisa); this can result in sedimentation. To avoid this, 12 flushing channels were constructed by cutting the point bars to ensure the water exchange between the rivers and the basins, and also between the oxbow lakes. The water depth is various in the different areas. In the nearly flat areas, formerly used as ploughlands and orchards, the water depth is only 0.8 m, but the depth of natural rivers, oxbow lakes and flushing channels are between 2.0 m and 5.0 m. The deepest point can be 20 m in the main bed of the River Tisza (Tisa) (Fejes, 2011).

As the result of the temporal and spatial diversity there are different living-spaces and landscapes. Mosaicity increases the attraction of the landscape, and the various living-spaces facilitate different tourism utilization: the edge effect at the boundary of ecological patches and mosaicity represent landscape attraction; recreation demands such as bathing, water sports (canoe, jet-ski); due to the different water bodies the possibilities of fishing activities are also various. Besides, the significance of Lake Tisza in ecotourism is considerable as the paradise of the ornithologists. The bird reserve area can be found in the Tisza (Tisa)valk bay, in the northern part of Lake Tisza (Tisa). It is protected from 1979 due to the Ramsar Convention. In 1993 it became a national park area since it was attached to the Hortobágy National Park.

3.2. The tourism of the Middle Tisza (Tisa) region

There was an intense economic development in the life of the settlements near the Middle Tisza in the second half of the 19th century when the productive agriculture was started in the floodplains after the river regulations. However, it did not mean quick catching-up after all. The main roads and railway lines avoided the Middle Tisza region and the area of Lake Tisza inside. Its development was also impeded by the county arrangements of the 1950s since its area was situated within the borders of 4 counties. The industrialization wave of the 1960s also avoided the area; the available raw material, the energy sources and the infrastructure necessary for the transportation were lacking. Thus, the studied area remained an underprivileged and disadvantaged so-called inner periphery of the Great Hungarian Plain. The situation became worse after the regime change when the settlements were in recession due to the reduced market of the productive agriculture (Radics, 2008). The emigration tendency of the inhabitants was more and more increasing in terms of both the national and international migration. The primary reason of the emigrations was the social and economic differences in the country, and this is also typical of nowadays i. e. there is higher unemployment in the eastern and the north-eastern part of Hungary than in the capital and the western regions. (Süli-Zakar and Csüllög, 2000; Baranyi, 2004; Internet 2). The emigration intensity was also increased by the high percentage of Romany people. The simultaneous occurrence of the existing problems made the increased exploitation of the tourism potential of Lake Tisza necessary, thus the settlements can slightly decrease the economic lag.

The recreation possibilities of the area were very inconsiderable before the formation of the Lake Tisza. Recreation infrastructure was available mostly in Tiszafüred (KIB, 1979). Some suitable places were used for bathing (Dead Tisza near Tiszafüred), others were used for fishing. They are frequented places in terms of passive recreation, and also the most popular recreational tourism areas in the catchment area of the River

Tisza (Tisa), nowadays (Michalkó, 2003). At the end of the 1970s, the newly flooded area (127 km²) and the considerable fish production attracted both native and foreign guests. In 1976 the number of the sold fishing tickets hardly reached 1000 pieces, but exceeded to 30000 by 1984 (VÁTI, 1985). According to the estimations, nowadays 40% of the guests in the region (i. e. 40000 people) visit Lake Tisza for fishing.

The tourism importance of Lake Tisza and the restructuring of the settlements into the tourism sector have already occurred in the 1980s. However, the implementation of the tourism infra- and suprastructure of the lakeside settlements started very slowly since the area was waiting for the third flooding (according to the former plans). In 1987 only Tiszafüred had the status of town (Radics, 2008), and the Touring Hotel was also built in this year. In Abádszalók, the mill became a hotel, and the Erzsébet-garden became a park. The construction of the recreation zone of Tiszanána (Dinnyéshát) was also among the tourism developments of the 1980s. Free beach and juvenile camping were created in Kisköre. Poroszló functioned as a fishing basis at that time. Kayak-canoe, boat, paddle boat rental stores and ports were established one after the other in Kisköre, Tiszafüred and Abádszalók. Due to the rough ground (wood trunks) most of the lakeside beaches were dangerous and life threatening (Füreder and Remenyik, 2008). Beaches were created in the 1990s in Tiszafüred, Kisköre, Poroszló, Sarud, Tiszaderzs and Tiszanána.

After the regime change, the abandoned local governments saw the flooded reservoir as the only chance that included the possibility of the tourism development.

3.3. Regional demarcations in Hungary

The demarcation of the regional administrative units in Hungary can be found in the act XXI of 1996. Its purpose was a comprehensive regional development innovation that emphasizes the regional policy of the European Union to prepare Hungary for the accession to the EU. The preparation of a development document, the strategic purposes of that are included in the operational programmes, was one of the basic conditions of the accession to the EU (Pénzes and Molnár, 2007). The content of the prepared document (National Development Plan) must have been harmonized with the formerly created NUTS levels (Kozma, 2003). In Hungary, seven statistical regions comprise the NUTS II level, their development purposes are summarized in seven operational programmes. The former county borders were preserved by the creation of seven planning statistical regions (Fig. 4).

Then 28/1998. (V.13.) IKIM-decree, and the 1007/1998. (I. 23.) government regulation ensured the legal background for the establishment of 8 and then 9 tourism regions, due to the modification of 4/2000. (II.2) decree of the Ministry of Economy. The demarcation of the jurisdiction area of the tourism regions seems to adapt to the significant recreation zones and considers the county borders as well. They are similar to the planning-statistical regions in their structure (Tóth, 2005), their nominations practically conform to the names of the planning-statistical regions (Northern Hungary, Northern Great Plain, Southern Great Plain, Central Transdanubia, Western Transdanubia, Southern Transdanubia). The significant recreation zones are the exceptions: Lake Balaton, Lake Tisza and Budapest-Central Hungary.



Fig. 4. Planning-statistical regions in Hungary.
Source: Own editing

According to Behringer and Kiss (2001) the tourism regions can be identified by their tourism supply. In our opinion a foreign tourist can not distinguish between the Northern and the Southern Great Hungarian Plain. According to other experts a tourism region can be more successful regarding marketing communication if their geographic name is also known internationally (Michalkó, 2002; Tóth, 2005). For example among the tourism regions described on the website of France Tourism Development Agency (Atout France) we can find regions such as Provence-Alpes-Côte d'Azur or the French Riviera; they are clearly harmonized with the physical geographic characteristics in their names (Internet 3). There are examples for the adaptation of the geographic names in marketing-communication in the Hungarian tourism as well. Instead of 9 there are five regions (due to their integration) that seem to be adapted to the physical geographic characteristics. The created "marketing regions" are the following: Transdanubia, Lake Balaton, Budapest-Central Transdanubia, Northern Hungary, and Great Hungarian Plain. "Great Hungarian Plain and Lake Tisza" naming can also be found (Aubert, 2011). In our opinion such integration of the tourism regions is not beneficial. The geographical characteristics of the "Great Hungarian Plain" (or the "Great Hungarian Plain and the Lake Tisza ") cover the macroregion of the plain, but the dune field of Bugac significantly differs from the aquatic attractions of Lake Tisza. In the international marketing communication of the Hungarian National Tourist Office the above-mentioned five regions are applied, but the used nominations are different and more informative regarding the tourism supply: Budapest and its surroundings, Lake Balaton, Pannonia, the Pusta and Lake Tisza, Eger-Tokaj Wine Region.

The area is also divided by landscape geographical divisions therefore the area can be characterized by newer structures.

3.3.1. Problems with the regional demarcations

The problems of the demarcations of the planning-statistical and the tourism regions appear in several ways:

- The concerns of the regional demarcation have already arisen with the dividing of the country into counties. These borders were the basis of determining the planning-statistical regions. During the designation of the borders neither the landscape geographical characteristics nor the nature conservation areas determined by the law were taken into consideration. Thus, the tourism regions are mostly adapted to the administrative borders. Sometimes the tasks for completion, the purposes and the necessary developments affect more counties, planning-statistical and tourism regions. The bird reserve in Tiszavalk basin (the area of Tiszafüred Biosphere Reserve) belonging to the Hortobágy National Park is an excellent example. As a Ramsar protected area the criteria of the international regulation are valid for it. In the northern part of the Tiszavalk basin there are the borderlines of Heves County and Borsod-Abaúj-Zemplén County. In the eastern part there are the borderlines of Heves County and Jász-Nagykun-Szolnok County. Accordingly it is situated at the junction of two planning-statistical regions, but regarding tourism the whole area of the reserve belongs to the Lake Tisza Tourism Region, and its managing is the competence of the Hortobágy National Park. The newest administrative restructuring that resulted in the re-formation of the townships, can be found on the 218/2012. (VIII.13.) decree. The lakeside settlements of Lake Tisza belong to eight townships. In my opinion, claiming the will of the decision-makers is quite complicated in such an administratively divided area.

- Demarcation problems are also significant regarding the formation of the development-support system. Territorial plans are necessary to reach the EU support. During the foundation of the National Development Plan (2004-2006) the physical geographical characteristics of the regions were not really concerned, the decision-makers adopted a general development guideline that can be applied both on the plains and the upland areas. The tender system was created more specifically in the New Hungary Development Plan (2007-2013) emphasizing the territorial differences.

- The cooperation of the national territorial and tourism development organisations is only partially ensured. That also causes difficulties during the determination of the development purposes. This is also confirmed by the documents of the National Tourism Development Strategy and the Tourism Development Strategy prepared in 2004, then in 2011 (NTS 2004, TS 2011, TÓTH 2005).

- The differences between the planning-statistical and tourism region borders also cause problems in the creation and the use of the databases. Hungary's best-known database supplier is the Hungarian Central Statistical Office. Regarding some development index (GDP) they collect data only at the level of counties and planning-statistical regions. Many experts were concerned by the solution i. e. the dividing of the GDP value based on the data related to the development (for example taxable income). However, only estimated GDP is resulted by the procedure (Kiss 2003; Lócsei and Nemes Nagy, 2003; Tóth, 2005).

- The presentation of the regional statistical data used in the statements must be taken into consideration. It is important that the ranging of the studied region (for example by the tourist tax) must be clearly identifiable in the document to be presented. Tourist tax

is significant since, as a local tax, it increases the direct income of the local governments. The assessment and the rate of the tax are determined by the local governments: for example in Szolnok 200 Ft, but in Hajdúszoboszló 410-450 Ft were paid per nights in 2012 (Internet 4.). Comparing planning-statistical regions, for example the two most frequented settlements of Lake Tisza: the tourist tax of Tiszafüred appears in the database of Northern Great Hungarian Plain, but that of Poroszló appears in the database of Northern Hungary. However, studying tourism regions both settlements belong to the Lake Tisza Tourism Region. In our opinion the significance of tourist tax is more considerable if the settlement returns it into the tourism developments (it is also described in the bill related to tourism). The settlement of the Lake Tisza Region, Berekfüdő will strengthen the best-known supply of the Northern Great Hungarian Plain: medical and health tourism. It will not appear with its new developments in the marketing of the lake.

Regional demarcation and the related administration system are less advantageous for the tourism sector. The local population and the economic actors firstly detect the deficiencies since in the everyday life they use the tourism infra- and suprastructure of the settlement, or they are strongly related to them (tourism enterprises).

3.3.2. Some options for the solution of the regional demarcation

In the long run the above-mentioned problems can not result in the linear improvement of the territorial and tourism development. In our opinion the EU support should be only one part of the developments. Moreover, initiatives and options that can generate development from a different approach are essential, such as:

- Tourism Destination Management aims to evaluate and represent the local demands to the decision-makers. Their formation is related to the geographical, social and historical roots, contrary to the borders of the regions. The tourism supply of the settlements and areas associated in the destination managements are very similar, thus their purposes and tasks are common. Destination managements can be an alternate solution for the problems related to the regional demarcation.

- Non-governmental organizations, that represent the area in an informal way, are necessary. The significance of the non-governmental organizations is minimal in the Lake Tisza region yet (Lake Tisza Development Ltd., 2014). The Balaton Tourism Region also has similar demarcation problems. However, the foundation of non-governmental organisations is in progress. For example Balaton Non-governmental Organisations Association was founded in 2001, or Balaton Wine Region was founded in 2003 and is physical geographically originated and does not adopt the administrative structure (Internet 5).

- The use of the new region development policies can also offer a solution. They aim at the development directions based on the inner synergy of the areas. They adapt to the principle of location-based approach and subsidiarity described in the European Union Territorial Agenda 2020 document (Lake Tisza Development Ltd., 2014). There are two basic directions for the creation of developments:

- Integrated Territorial Investment (ITI): it covers sub-regional areas and the selection is performed by the upper management. This can be carried out with the union of several operative programmes and the preparation of an integrated strategy. The area can get a source of billions.

- Community-Led Local Development (CLLD): communities organized in the society, the community managing is performed by the Local Action Group (LAG). During the implementation the decision-making is communal involving the business and the civilian sector. Its disadvantage is that less support source is available comparing to the ITI.

4. CONCLUSIONS

Summarizing the study we would like to repeatedly emphasize the national economic significance of the tourism nowadays. Tourism in Hungary represents an opportunity to develop especially such areas like Lake Tisza that are economically lagging inner periphery areas with excellent tourism potential.

The physical geographical characteristics and the tourism development of the destination were studied, while the demarcation problems of the area were also discussed. Territorial fragmentation affects the maximum availability of the development-tender system, the cooperation within the territorial and tourism development institution system; the precise preparation of the statistical databases comparing the areas.

In this paper we tried to list development-oriented organizations (without being exhaustive) that are organized in the society and can be suitable for solving the tourism development related problems of the Lake Tisza Region.

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SKI AREAS AND SLOPES IN ROMANIA. REVIEWING CURRENT STATE OF WINTER SPORTS TOURISM UNFOLDING POSSIBILITIES WITHIN CARPATHIAN MOUNTAINS

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ABSTRACT. – **Ski Areas and Slopes in Romania. Reviewing Current State of Winter Sports Tourism Unfolding Possibilities within Carpathian Mountains.** This study is reviewing nowadays Romania's tourism supply (2015) – laying special emphasis on the North-West Development Region's situation – in terms of winter sports potential (resources) and material and technical base (specific infrastructure). It calls into question a highly discussed topic within the domain of interest of Tourism Geography, whose recursiveness could be justified by continuous changes that influence the quantitative and qualitative configuration of ski areas, ski tracks and related equipment².

The existence of favourable natural support in terms of relief and climate is an indispensable prerequisite to the development of winter sports tourism within any area. From this point of view, the presence of the Carpathians is a major advantage for Romania, the more so as the proportion of the mountain sector represents 30 percent of the national area (238,391 square kilometres). By occupying different amounts of the territory belonging to 6 development regions and 19 counties, heterogeneous tourism potential values have emerged, causing unequal exploitation opportunities within the mountain area. The purpose of this paper is to provide a general framework of Romanian ski slopes, areas and corresponding facilities for assessing their current state, from regional perspective, with emphasis on North-West's situation. On this line, the main objectives, starting from identifying and inventorising to classifying regions and ski tracks based on hierarchical categories, also deal with ranking slopes according to surface, length, width, elevation of departure point, difference in elevation, difficulty ratings, capacities of slopes and cable transportation means. In order to achieve these goals, quantitative research methods and techniques mostly referred to observation, analysis, synthesis and comparison of statistical data, well-synthesized within tables, graphical and cartographical representations. Aiming to highlight Romania's specificity concerning mountain tourism and winter sports unfolding possibilities, with an almost century-old tradition, came out that the best numerical and typological tourism supply representation belongs to the Central Region whereas for the North-West Development Region, Maramureș and Cluj counties impose themselves through the potential of their largest ski areas and resorts: Cavnic and Muntele Băișorii.

Keywords: *tourism potential, mountain tourism, ski domain, ski run, hierarchical categories, facilities.*

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² See the references (articles, doctoral theses, books).

1. INTRODUCTION

The Carpathian Mountains extend over 1500 km (Ghinea, 2002) across seven countries situated in Central and Eastern Europe, including Romania. Their total surface area is about 170,000 square kilometres (Ghinea, 2002), of which 66,303 square kilometres cover nearly a third of the territory of Romania (Surd, 2008).

Given the large extension of the mountain range it was just a matter of time before tourist activities started to unfold and develop. Thus, in the second half of the nineteenth century, the first recreation and mountain resorts began to take shape in the Romanian Carpathians; more precisely, in Bucegi Mountains turning Sinaia into the very first modern mountain climatic resort in the country and also the first resort town in Romania, in 1885 (Ciangă and Dezsi, 2007). Ever since, mountain tourism has continued to grow, both during the inter-war period, when the first ski chair lift was introduced in Semenic Mountains, in 1942 and afterwards, starting with the 1970's when new resorts emerged and higher investments were made in the specific infrastructure, especially in accommodation and cable transportation (Ciangă and Axente, 1996). The latter brought into requisition the chair lifts and ski lifts, seconded by eight cable cars that were implemented until the early 80's to ensure the fast access to the ski areas and related slopes (Ciangă and Axente, 1996).

Although the following years after the Romanian Revolution of 1989 were characterised by stagnation, nowadays, people have realised that having access to the mountain area in order to exploit its tourism potential or, even more, hosting ski resorts, is a major advantage for the regional and local economies that often refer to tourism as a source of income. All the more so as a resort represents much more than the ski area; is also about its facilities, accommodation and catering, supplementary services and even environmental protection (Ilieș, 2007). Hence, the more diversified the tourism potential and infrastructure is, the more attractive the tourist supply becomes, reason for which, winter sports tourism packages have always enjoyed certain popularity amongst tourists.

Taking all this into consideration, the need of being aware of the possibilities of practicing winter sports, is generally valid for both entrepreneurs and tourists willing to take advantage of mountain tourism. For this reason, the interest in publications which bring into prominence the status of ski domains is quite high and determines the tourism product's consumption, causing not only the increment of tourists' number, but also the economic growth in the area.

Under these circumstances, this paper aims to present a review of Romania's mountain tourism potential current state in terms of ski areas and runs, from general aspects to specific features, illustrated from a territorial-administrative point of view, focused on development regions and counties with winter sports tourism unfolding possibilities.

2. MATERIALS AND METHODS

One of the most important parts of this research concerned data collection and database constitution whose main source of information coincided with a recommendatory tourist website (www.romaniaturistica.ro), extremely reliable due to its daily updating and inventory maintenance. Data gathering and measuring continued with using other quantitative methods and techniques, such as statistical and cartographical ones, to illustrate through tabular and graphical representations the results obtained by observation and synthetic methods, which were finally submitted to comparison and analysis.

Due to the large amount of data that revealed characteristics usually associated with ski slopes, a series of objectives were clearly settled, at national and regional levels, with emphasis on the North-West Region's counties, aiming to:

- identify ski areas and slopes' total number and distribution;
- classify regions and counties in Romania based on winter sports tourism potential;
- indicate highest rated ski slopes and rank ski tracks according to surface, length, width, elevation of departure point, difference in elevation, difficulty ratings and capacities of ski tracks and cable transportation means;
- determine cable transportation means' number, type, distribution and capacity;
- calculate ski slopes' total surface, length, capacity and cable transport capacity;
- calculate average for surface, width, elevation of departure point, difference in elevation and capacities of ski tracks and cable facilities;
- highlight the number of ski slopes equipped with snow cannons and night lighting installations, along with their certification status;
- rank from highest to lowest top 10 ski areas in Romania.

It is worth mentioning that all classification categories that were used, except the difficulty ratings of ski slopes (whose values are standard ones, established by law), were framed by the authors according to Romania's tourism supply in terms of morphological features of the Carpathians (elevation, slope, fragmentation etc.) and tourist facilities' (cable transport system and transportation means) quantitative and typological dimension.

3. RESULTS AND DISCUSSIONS

3. 1. Number and distribution of ski areas and ski slopes

From a territorial-administrative perspective, Romania is divided into 41 counties (and the municipality of Bucharest), all grouped into 8 development regions (fig. 1). As it was stated before, approximately 30 percent of Romania's total surface is occupied by the Carpathians, which partially cover 7 regions and 27 counties.

However, one can notice in the above map (fig. 1), that although all three major groups of the Carpathians pride themselves with famous mountain tourist resorts such as Sinaia, Bușteni, Predeal, Azuga, Poiana Brașov, Păltiniș, Băișoara, Cavnic, Borșa etc (Cocean, 2010), not all counties which incorporate mountain sectors benefit from the possibilities for practicing winter sports. This leaves Romania with 6 development regions and 19 counties where this tourism form is supported by at least one ski area, composed of a variable number of ski slopes (Fig. 2), from 1 (i.e. Argeș and Bacău), to more than 25 (i.e. Harghita and Prahova).

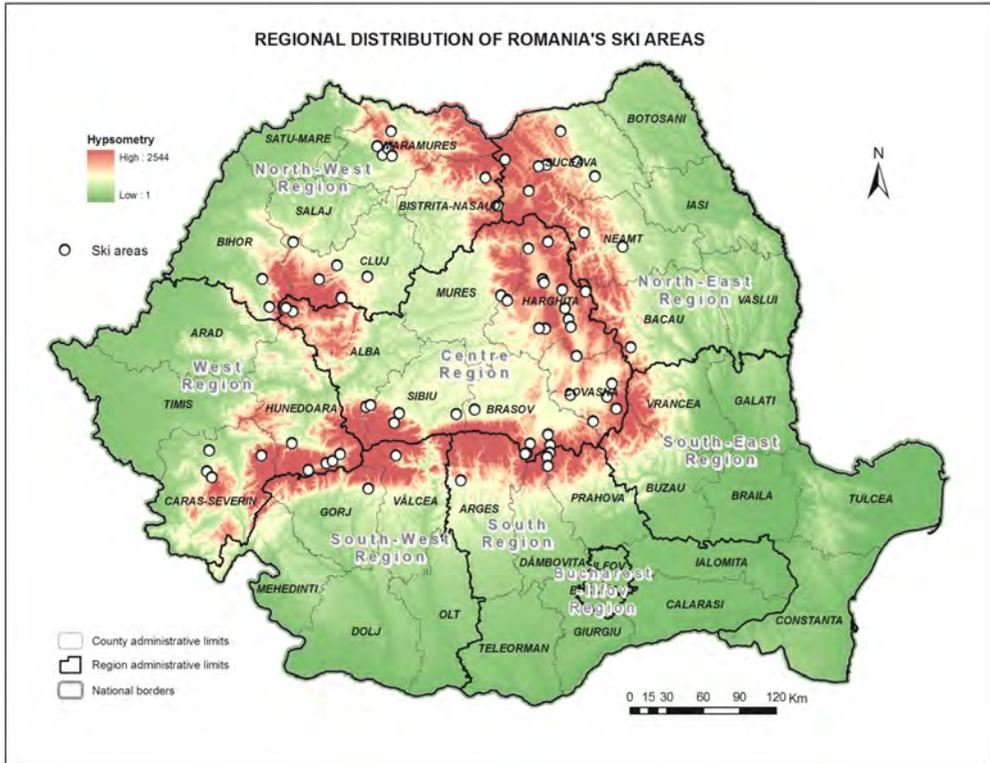


Fig. 1. Distribution of ski areas within Romania’s development regions and counties.

In 2001, Romania had 73 ski slopes, all located within the territory of 16 counties (Dinu and Pețan, 2003). Since then, not only the counties’ number has increased by three – putting Argeș, Bacău and Vâlcea on the map of winter tourism – but the number of ski tracks, as well, which has doubled until 2010, reaching 163 ski tracks (Gingulescu, 2010) and tripled by 2015.

According to the latest statistical values, at present time (2015) Romania has 227 ski slopes grouped into 71 ski areas, located within the territory of 19 counties (fig. 2). The Central Region has the best-developed potential in terms of winter sports unfolding possibilities due to its 88 ski slopes, concentrated into 32 ski areas (fig. 3). Not to mention the fact that this region is the only one which embeds mountain areas belonging to all three Romanian Carpathian divisions (Eastern, Southern and Western) and all its component counties (Alba, Brașov, Covasna, Harghita, Mureș, Sibiu) host at least one ski area. By contrast, the South-West Region integrates the smallest number of ski slopes and areas, situated in 2 of its 5 counties: Voineasa Ski Area in Vâlcea County and Râncea Ski Area in Gorj County.

Based on the ski slopes' number, the tourist potential of Romania's regions and counties could be summarised in five hierarchical categories, ranked from null to extremely high. As shown below (Tabel 1), nearly all development regions have a representative county within the latter category, except for South-West. On the other hand, the Central one prides itself on being the only region with 2 counties inside the best rated category, namely Harghita and Braşov, although the former does not have such well-developed ski areas. Whereas in Harghita the largest number of ski slopes integrated within a ski area is lower than 7, in Prahova County (South Region), this number reaches 16 ski slopes, making Sinaia the greatest ski area in the Romanian Carpathians; closely followed by Straja Ski Area (12 ski tracks), located in Hunedoara County (West Region), and Şureanu Ski Area (10 ski slopes), situated in Alba County (Centre Region). The fourth place is being shared by two ski areas: Poiana Braşov (Braşov County, Centre Region) and Cavnic (Maramureş County, North-West Region) with 9 ski slopes apiece.

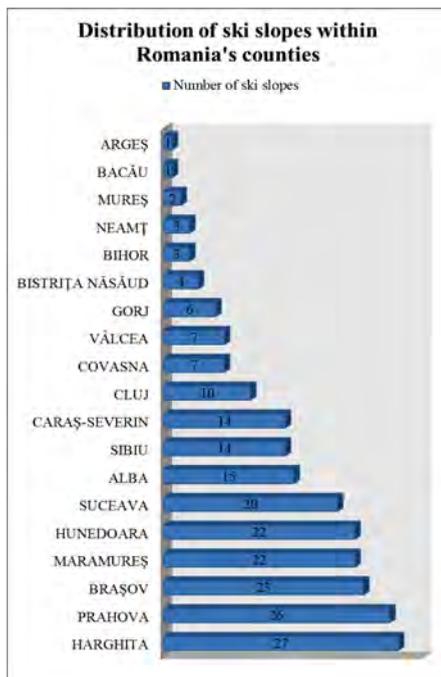


Fig. 2. Ski slopes' distribution within Romanian counties.
 Source: <http://www.romaniaturistica.ro>.
 Last accessed: 18 January 2015.

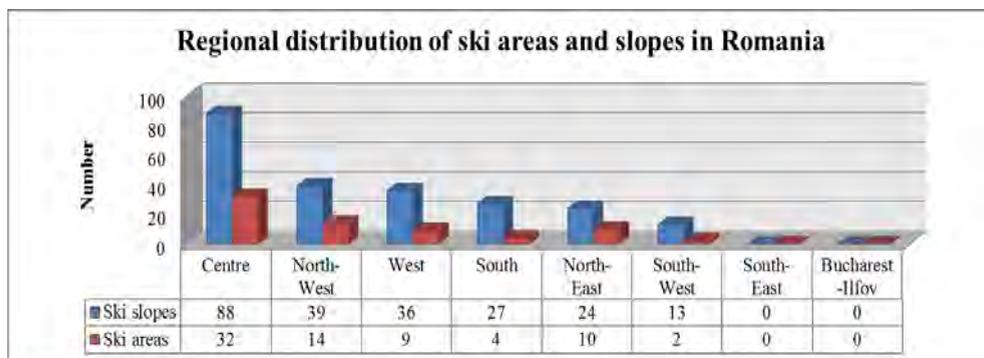


Fig. 3. Ski slopes' distribution within Romania's regions.
 Source of statistical data: <http://www.romaniaturistica.ro>.
 Last accessed 18 January 2015.

Table 1.

Categories of tourism potential based on ski slopes' number and distribution

Tourism potential categories	Regional number of ski slopes	Romania's development regions	Counties' number of ski slopes	Romania's counties	North-West Region's counties
Extremely high	<i>more than 50</i>	Centre	<i>more than 20</i>	HR, PH, BV, MM, HD, SV	Maramureș (MM)
High	<i>36 to 50</i>	North-West, West	<i>10 to 19</i>	AB, SB, CS, CJ	Cluj (CJ)
Medium	<i>21 to 35</i>	South, North-East	<i>4 to 9</i>	CV, VL, GJ, BN	Bistrița Năsăud (BN)
Low	<i>1 to 20</i>	South-West	<i>1 to 3</i>	BH, NT, MS, BC, AG	Bihor (BH)
Null	<i>0</i>	South-East, Bucharest-Ilfov	<i>0</i>	SJ, SM, BT, IS, VS, AR, TM, DJ, MH, OT, CL, DB, GR, IL, TR, BR, BZ, CT, GL, TL, VN, IF	Sălaj (SJ), Satu Mare (SM)

Source: <http://www.romaniaturistica.ro>. Last accessed: 18 January 2015.

3. 2. Surface of ski slopes

As the number of ski slopes tripled over the past 15 years, the total surface of Romanian ski area has increased and the 374 ha that Romania held in 2001 (Glăvan, 2000; Dinu and Pețan, 2003), turned into 893.18 ha of ski areas up to the present time (2015).

As shown below (table 2), more than 330 ha belong to the Central Region, which hosts the largest ski slope in the country, Curba de Nivel-Pilon 2, located within Bâlea Lac Ski Area, in Sibiu County. Although the highest rated ski slopes of each Romanian region have more than 10 ha (except for North-West), the best representation pertains to the small-sized ski slopes category, both at national and regional level, except for South, where the predominant category coincides with medium-sized ski slopes. Thus, while 60 percent of the 227 Romanian ski tracks have less than 4 ha (3.93 ha national surface average), the 16 ski slopes which form Sinaia (South Region), the greatest ski area in Romania, gather 76.3 ha.

What also emerges from the table is that Centre and North-East regions are the only ones having extremely large-sized ski slopes, in Bâlea Lac Ski Area (Sibiu County) and in Câmpulung Moldovenesc Ski Area (Suceava County), even if the latter region lacks both large and extremely-small sized runs, as in the case of West Region, which does not have slopes whose surface is less than 1 ha.

Regarding North-West region's situation, it is worth mentioning that all four counties which provide favourable conditions for winter sports have small-sized ski slopes. However, Maramureș distinguishes itself as the highest rated county in terms of total surface of ski areas (88.76 ha), largest ski area (Cavnic: 36.6 ha), greatest ski slope (Șuior: 9 ha) and best representation of the hierarchical categories (4 types). Although the total surface of the ski areas in Cluj County is less than Cavnic's overall surface, gathering 30.59 ha, the difference between the biggest ski slope in Cluj, Băișoara (Pârtia Mare) and Șuior is lower than 2 ha.

Table 2.

Highest rated ski slopes and regional hierarchies based on surface

Surface categories	Centre	North-West	West	South	North-East	South-West	ROMANIA (number of ski tracks)
Highest rated ski slope (ski area, county)	21 ha: Curba de Nivel-Pilon 2 (Bălea Lac, SB)	9 ha: Şuior 1 (Şuior, MM)	12,8 ha: Telegondola (Straja, HD)	10,7 ha: Nouă (Sinaia, PH)	15 ha: Rarău 1 (Câmpulung Moldovenesc, SV)	11 ha: Transalpina 1 (Voineasa, VL)	21 ha: Curba de Nivel-Pilon 2 (Bălea Lac, SB)
Extremely large-sized (15-22 ha)	2	-	-	-	1	-	3
Large-sized (8-14.99 ha)	6	4	9	3	-	1	23
Medium-sized (4-7.99 ha)	20	7	6	13	5	2	53
Small-sized (1-3.99 ha)	55	24	21	9	18	8	135
Extremely small-sized (less than 1 ha)	5	4	-	2	-	2	13
Total surface (ha)	334.6 ha	140.5 ha	170.9 ha	125.4 ha	81.58 ha	40.2 ha	893. 18 ha

Source: <http://www.romaniaturistica.ro>. Last accessed: 18 January 2015.

3. 3. Length of ski slopes

Other important morphometric parametre which has also changed a lot over the last years, is the length of ski slopes and what in 2001 started as 91 km of ski tracks (Glăvan, 2000; Dinu and Peşan 2003), nowadays has multiplied nearly three times, making Romania the possessor of 246.9 km of ski slopes in terms of length.

Irrespective of the displayed values, it can be noticed that the previous table and the one below are quite resembling in some aspects, starting from the highest rated region (Centre) and ski slope (Curba de Nivel-Pilon 2) to the hierarchical order in which the second place goes to West Region, followed by North-West and so on (table 3). Concerning the most widely spread category of ski tracks, both national and regional put themselves on the map with short ski slopes whose length range from 500 to 1,000 m. In spite of this, Centre and West regions host 6 of the longest ski tracks in the country: Curba de Nivel-Pilon 2 (14,000 m), Pilonul 2-Bălea Cascadă (13,000 m), Măloasa (12,000 m), Drumul Roşu (5,530 m), Straja (8,100 m), Semenik (5,800 m). While these two regions are the only ones sharing the extremely and the very long ski slopes ranking categories, South and North-East just lack ski tracks which have less than 150 m.

As regards the North-West current state, Maramureş remains the favourite county, with the highest total length (19.01 km), longest ski track (Albastră: 2,250 m, Cavnic Ski Area) and best typological representation according to length classification; whereas Cluj County totalizes 8.17 km from its 10 ski tracks, of what the longest, Buscat 1, from Muntele Băişorii Ski Area, has 1.300 m in length.

Table 3.

Highest rated ski slopes and regional hierarchies based on length

Length categories	Centre	North-West	West	South	North-East	South-West	ROMANIA (number of ski tracks)
Highest rated ski slope (ski area, county)	14.000 m: Curba de Nivel-Pilon 2 (Bălea Lac, SB)	2.250 m: Albastră (Cavnic, MM)	12.000 m: Măloasa (Muntele Mic, CS)	2.153 m: Nouă (Sinaia, PH)	3.000 m: Rarău 1 (Câmpulung Moldovenesc, SV)	2.257 m: Transalpina 1 (Voineasa, VL)	14.000 m: Curba de Nivel-Pilon 2 (Bălea Lac, SB)
Extremely long (10,000-15,000 m)	2	-	1	-	-	-	3
Very long (5,000-9,999 m)	1	-	2	-	-	-	3
Long (2,000-4,999 m)	6	3	2	2	3	1	17
Medium length (1,000-1,999 m)	17	10	8	7	4	1	47
Short (500-999 m)	37	16	12	11	11	7	94
Very short (150-499 m)	24	9	10	7	6	3	59
Extremely short (less than 150 m)	1	1	1	-	-	1	4
Total length (km)	102.2 km	33.1 km	53.7 km	25.1 km	23.1 km	9.5 km	246.9 km

Source: <http://www.romaniaturistica.ro>. Last accessed: 18 January 2015.

3. 4. Width of ski slopes

With a national average width of 47.1 m, 58 percent of ski slopes in Romania are low ranked. This predominant category also stands for the development regions, except for South, where most ski tracks have a medium width, ranging from 50 to 100 m (Table 4). Moreover along with South-West, the South region lacks ski tracks whose width exceeds 100 m, in contradistinction to Centre Region where the highest width reaches 150 m, in more than one ski slope: Cocoș-Pârâul Rece (Brașov), Ciumani (Harghita), Curba de Nivel-Pilon 2 and Pilonul 2-Bălea Cascadă (Sibiu).

On the subject of North-West situation, Cluj County excels at both best typological representation of ski slopes and widest run in the region, Băișoara Specială (100 m) in Muntele Băișorii Ski Area; whereas in Maramureș, although there are no high-width representatives, the widest ski slope is only 10 metres less than the one in Cluj and is located within Cavnic Ski Area (Roata 1 Ski Slope: 90 m).

Table 4.

Highest rated ski slopes and regional hierarchies based on width

Width categories	Centre	North-West	West	South	North-East	South-West	ROMANIA (number of ski tracks)
Highest rated ski slope (ski area, county)	150 m: Cocoș-Pârâul Rece (Predeal, BV), Ciumani (Ciumani, HR), Curba de Nivel-Pilon 2 și Pilonul 2-Bâlea Cascadă (Bâlea Lac, SB)	100 m: Băișoara Specială (Muntele Băișorii, CJ)	100 m: Slalom Uriăș (Mutu) (Straja, HD)	80 m: Valea Dorului Subtelescaun 1 și (Sinaia, PH)	100 m: Runc 1 (Câmpulung Moldovenesc, SV)	60 m: Păpușa-Râncă 1 (Râncă, GJ)	150 m: Cocoș-Pârâul Rece (Predeal, BV), Ciumani (Ciumani, HR), Curba de Nivel-Pilon 2 și Pilonul 2-Bâlea Cascadă (Bâlea Lac, SB)
High width (more than 99 m)	7	1	1	-	1	-	10
Medium width (50-99 m)	38	8	13	17	7	3	86
Low width (less than 50 m)	43	30	22	10	16	10	131

Source: <http://www.romaniaturistica.ro>. Last accessed: 18 January 2015.

3. 5. Elevation of departure point of ski slopes

The Carpathians are considered medium-elevation mountains whose highest peak, Moldoveanu (2,544 m), is part of the 13 Romanian peaks, reaching more than 2,500 m, all located in the Southern Carpathians. Therefore, not surprisingly, the highest departure points for the 25 ski slopes of the high-elevation category belong to the Centre, South and South-West development regions (table 5) whose territories are occupied by the Southern Carpathian Mountains.

Although the highest departure point for a ski run in Romania is situated at 2,200 metres above sea level, within Bâlea Lac Ski Area (Sibiu County, Central Region), the average departure point corresponds to 1,344 m. Consequently, at national level, most runs are medium-low elevation representatives (34%) and medium ones (33%). While in North-West and North-East, the former category prevails, in Central Region, characterised by the best typological representation regarding the hierarchical categories of elevation, both categories share a dominant positions.

The North-West counties exhibit the same ruling category, medium-low elevation, followed by medium one (except for Bihor County where the latter prevails) and same triple configuration of the typological classes: medium-low, medium, medium-high for Cluj and Maramureș counties. Although the highest value for ski run' departure point is held by Vârful Știol (1,700 m), within Borșa Ski Area, this slope is the only medium-high elevation one in Maramureș, whereas in Cluj County, this category has three representatives ski tracks, at a 1,677 m departure elevation, all located within Muntele Băișorii Ski Area.

Table 5.

Highest rated ski slopes and regional hierarchies based on departure elevation

Departure elevation categories	Centre	North-West	West	South	North-East	South-West	ROMANIA (number of ski tracks)
Highest rated ski slope (ski area, county)	2,200 m: Curba de Nivel-Pilon 2 (Bălea Lac, SB)	1,700 m: Vârful Știol (Borșa, MM)	1,868 m: Straja (Straja, HD)	2,100 m: Carp (Sinaia, PH)	1,400 m: Rarău 1 (Câmpulung Moldovenesc, SV)	1,974 m: Transalpina 2 (Voineasa, VL)	2,200 m: Curba de Nivel-Pilon 2 (Bălea Lac, SB)
High (1900-2200 m)	7	-	-	11	-	7	25
Medium-high (1600-1899 m)	15	4	17	2	-	5	43
Medium (1200-1599 m)	31	11	16	8	8	1	75
Medium-low (700-1199 m)	31	24	3	6	13	-	77
Low (less than 700 m)	4	-	-	-	3	-	7

Source: <http://www.romaniaturistica.ro>. Last accessed: 18 January 2015.

3. 6. Difference in elevation of ski slopes

In association with length, this parametre derived from the elevation difference between the departure and the arrival point, indicates the most appropriate difficulty rating of a slope. Without insisting too much upon it, what is really worth mentioning is that although most Romanian ski tracks belong to the medium-low difference category, with an average of 194 m, the highest elevation between the departure and arrival point can be encountered within Măloasa Ski Slope (Muntele Mic Ski Area, Caraș Severin County). It registers nearly 1,000 m, and along with other 7 ski tracks, pertains to the high difference category which can only be found in the Centre and West regions (table 6).

Table 6.

Highest rated ski slopes and regional hierarchies based on difference in elevation

Difference in elevation categories	Centre	North-West	West	South	North-East	South-West	ROMANIA (number of tracks)
Highest rated ski slope (ski area, county)	728 m: Lupului (Poiana Brașov, BV)	526 m: Mogoșa (Mogoșa, MM)	980 m: Măloasa (Muntele Mic, CS)	561 m: Sorica (Azuga, PH)	515 m: Rarău 1 (Câmpulung Moldovenesc, SV)	530 m: Transalpina 1 (Voineasa, VL)	980 m: Măloasa (Muntele Mic, CS)
High difference (600-1000 m)	4	-	4	-	-	-	8

Difference in elevation categories	Centre	North-West	West	South	North-East	South-West	ROMANIA (number of tracks)
Medium-high difference (400-599 m)	3	2	1	4	1	1	12
Medium difference (200-399 m)	17	15	9	10	8	1	60
Medium-low difference (50-199 m)	51	18	19	10	14	8	120
Low difference (less than 50 m)	13	4	3	3	1	3	27

Source: <http://www.romaniaturistica.ro>. Last accessed: 18 January 2015.

About North-West, what can be pointed out is that all counties possess medium-low and medium difference in elevation slopes whereas only Maramureş integrates low and medium-high rated runs, with greatest value reaching 526 m in Mogoşa Ski Slope.

3. 7. Difficulty ratings of ski slopes

According to the difficulty ratings (induced by the slope's gradient and established by law³), 40 percent of Romanian ski tracks are for intermediate skiers and most of them belong to North-West, West, South and North-East development regions. The other two regions excel in the easy-slopes' category, which gathers 34 percent out of total national number (227). As it can be observed (table 7), the majority of ski slopes for expert skiers belong to the West, North-West and Centre, where the highest rated ski slope is hosted, in Covasna County, recording a 41% gradient in Covasna Ski Area.

Towards North-West current state, Maramureş and Cluj come into prominence due to the exhaustive representation of all four difficulty ratings classes and the predominance of intermediate runs in Maramureş and easy ski slopes in Cluj, whereas the other two counties continue to lack extremely easy ranked runs for beginners.

Table 7.

Regional distribution of ski slopes based on difficulty ratings

Difficulty ratings	Indicator colour	Centre	North-West	West	South	North-East	South-West	ROMANIA (number of ski tracks)
Difficult (more than 30%)	black	14	10	10	4	3	1	42

³ Ministry of Tourism Decree no. 491/ 2001 approving the norms on homologation, planning, maintenance and operation of ski slopes and trails for leisure.

Difficulty ratings	Indicator colour	Centre	North-West	West	South	North-East	South-West	ROMANIA (number of ski tracks)
Intermediate (20-29%)	red	31	14	16	14	12	4	91
Easy (11-19%)	blue	36	13	9	7	8	5	<i>78</i>
Extremely easy (less than 10%)	green	7	2	1	2	1	3	16

Source: <http://www.romaniaturistica.ro>. Last accessed: 18 January 2015.

3. 8. Cable transport system and means of transportation

Since 1942, when the very first ski chair lift went into service in the Romanian Carpathians, until 1998, when the cable transportation system reached 64 units (Glăvan, 2000), things have evolved a lot, although by 2002 the situation remained unchanged (Dinu and Pețan, 2003). But the first 60 years did not even remotely compare to the boom of cable equipments that had characterised the following 13 years, making Romania the owner of 287 transportation units (60 more than the existing tracks).

Although 41 ski slopes possess more than one lift vehicle, 10 tracks lack cable transportation facilities, leaving the other 176 ski slopes endowed with one ski lift device. As illustrated in figure 4, the cable transport system in Romania is characterised by a wide typological dimension, gathering 8 different types of means of transportation, which could be grouped in 4 main categories: ski lifts, chair lifts, cable cars and gondolas. It can also be observed that while the most widespread equipment belongs to the first category, more precisely to the mono-post ski lift with towing devices (50.8%), followed, by far, by chair lifts with 2 seats and baby ski lifts, the less common one corresponds to disengageable chair lifts with 4 seats (2.7%).

Regarding the regional distribution of the cable transportation means, the Central Region holds the supremacy in terms of typological dimension, due to the 7 representative types of lifts. On this line, two ski slopes from Poiana Brașov Ski Area (Brașov County) come to the front, both at national and regional level, on the basis of highest diversity, ensured by the 4 types of cable facilities – mono-post ski lift with towing devices (1), permanent/fixed ski chair lift with 4 seats vehicles (1), gondola lift (1), cable car (2) – that winter sports enthusiasts have access to Ruia Ski Slope and Lupului Ski Slope. These two ski tracks along with Drumul Roșu Ski Slope, also located in Poiana Brașov, make this ski area the best equipped one from a quantitative point of view, as well. However, 5 units of transportation within one ski slope can also be found within Straja Ski Area (Hunedoara County), at Platoul Constantinescu and Platoul Soarelui ski tracks, thus determining both West and Centre development regions to be in the lead. Though the latter holds dominion over most types of installations, numerically speaking, three of them are better represented in South, where gondola lifts (7) and chair lifts with 4 seats (7) enjoy the highest concentration.

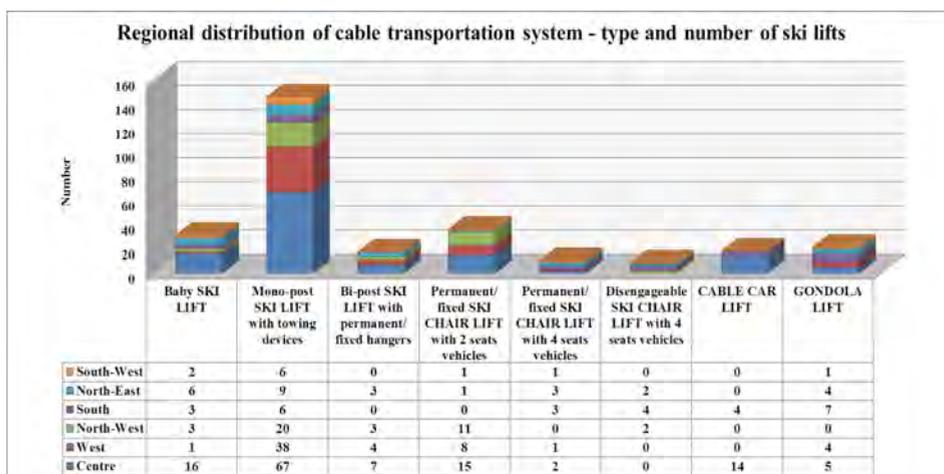


Fig. 4. Cable transportation units distribution within Romania's development regions.
 Source: <http://www.romaniaturistica.ro>. Last accessed: 18 January 2015.

With respect to the North-West counties, it is worth mentioning that although all ski areas are endowed with cable transportation equipments and the total number of units is 39 (as the total number of ski slopes), two runs from Cavnic Ski Area lack this kind of facility. Still, Cavnic and Mogoşa ski areas (Maramureş County) are the only ones that provide winter sports fans with two different types of installations within one ski slope (within Icoana 2 and Mogoşa runs). It may be pointless to say that Maramureş possesses the most numerous cable transportation facilities, followed by Cluj, but it may be interesting to know that whereas within these two counties the mono-post ski lifts with towing devices prevail, Bistriţa Năsăud stands out with the best typological representation (4 ski tracks, each of them equipped with different types of ski lifts and even a chair lift with 2 seats).

3. 9. Capacity of cable transportation means and related ski slopes' capacities

As important as the installation itself is the related capacity of transporting skiers and non-skiers within the precincts of ski tracks, whose overall capacity (mostly induced by surface) leaves its mark on the cable transport system's dimension. Given the interrelationship between these two parameters we decided to show them in parallel, to facilitate further comparisons. Thus, what emerges from the graphical representation is that both national and regional values of the cable transportation means' capacity are higher than those belonging to the capacity of the ski tracks. According to the displayed statistical information (fig. 5), Romania's total capacity in terms of cable facilities reaches 214,038 persons, being best represented within the Central Region (41.8%), whereas the national values for the ski slopes' overall capacity sum up 175,073 persons, owing the 42.2 percents to Centre, as well. Regardless of the capacity type, the hierarchical order remains mostly the same, except that the third position belongs to the North-West Region only when it comes to ski tracks' capacity. As for the cable transportation capacity, this region is ranked fourth, after South.

Reviewing the highest rated ski slopes in terms of analysed capacities, on the one hand Poiana Brașov Ski Area with its ski run, Ruia (Brașov County, Centre Region) comes into prominence due to the highest capacity of cable transportation facilities corresponding to 5770 persons; on the other hand, Straja Ski Area with Platoul Soarelui Ski Slope (Hunedoara County, West Region) imposes itself through an overall capacity of 3500 persons. As for the average capacity, the cable transportation equipments support up to 1000 persons, whereas for the ski tracks, an average of 795 persons describes best up to what they can support.

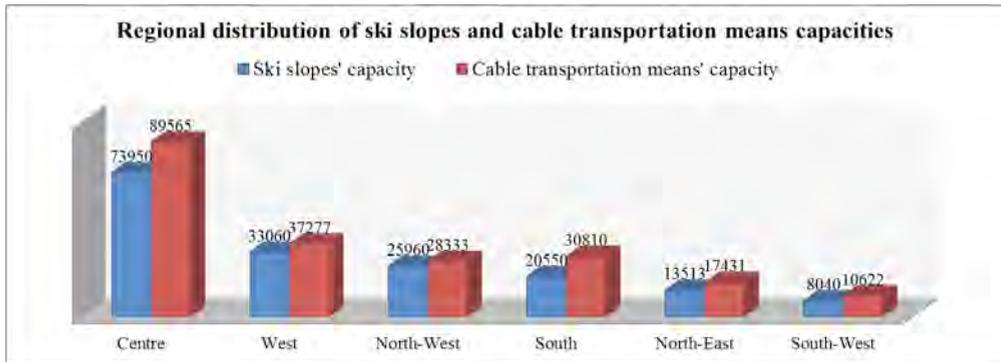


Fig. 5. Ski slopes and cable transportation means capacities within Romania's development regions.
 Source: <http://www.romaniaturistica.ro>. Last accessed: 18 January 2015.

Finally, within North-West, Maramureș rules once again due to the highest capacity of both cable transportation (total capacity: 15185 persons; highest capacity: 1560 persons in Mogoșa Ski Slope) and ski slopes (total capacity: 12410 persons) although the highest one belongs to Bihor County – Piatra Grăitoare Ski Slope (1500 persons). In contradiction to the national and regional values, in Cluj County the cable transportation capacity (7662 persons) is lower than the one of the ski tracks (8150 persons), indicating an undersized cable transport system in relation to the ski slopes support capacity, though the highest rated values for both of them are identical: 1400 persons, in all three ski slopes (Buscat 1, 2, 3) in Muntele Băișorii Ski Area.

3. 10. Other facilities related to ski slopes: snow cannons and night lighting installations

In order to increase the ski slopes' usability, availability and attractiveness, most investments have targeted snow cannons and night lighting installations' implementation. Although more than half of the total number of ski tracks in Romania still lack these kinds of facilities, 106 ski slopes are equipped with snow cannons – most of them belonging to Central Region (36.7%), followed by North-West and West which share the same values (16%) – and there are 78 ski tracks that have night lighting installations, mainly pertaining to Centre (48.7%), North-West (15.3%) and North-East (14.1%). As shown below (table 8), broadly speaking, the regional number

of ski slopes with snow cannons is higher than the number of those which possess night lighting, except for the North-East Region, where the numerical values are identical. Another region which breaks the record is South-West, where the ski tracks that provide snow cannons are more common than those which are deprived of this facility.

North-West situation reveals the same habitual hierarchical order with Maramureş on top position due to the greatest number of snow cannons (in 11 ski tracks) and night lighting installations (in 8 ski slopes), followed by Cluj (5 ski slopes with snow guns and 2 with night lighting) and Bihor. Thus, while the first two counties have higher percentage values than the national average, due to the 50 percent of ski tracks equipped with snow cannons, Bistriţa Năsăud lacks any such sort of facility.

Table 8.**Regional distribution of ski slopes based on facilities and status**

Facilities	Snow cannons		Night lighting installations		Status		
	YES	NO	YES	NO	Certified	Uncertified	Not specified
Development region							
Centre	39	49	38	50	66	8	14
North-West	17	22	12	27	21	8	10
West	17	19	10	26	27	3	6
South	12	15	4	23	23	1	3
North-East	11	13	11	13	14	-	10
South-West	10	3	3	10	12	-	1
ROMANIA	106 <i>(47%)</i>	121 <i>(53%)</i>	78 <i>(34%)</i>	149 <i>(66%)</i>	163 <i>(72%)</i>	20 <i>(9%)</i>	44 <i>(19%)</i>

Source: <http://www.romaniaturistica.ro>. Last accessed: 18 January 2015.

3. 11. Status of ski slopes and overall tourism potential

According to the Ministry of Tourism assessment, 72 percent of the 227 existing ski tracks in Romania meet favourable conditions which ensure appropriate unfolding of winter sports tourism. Given the fact that the consulted information source did not specify the status of 44 ski tracks, the up-above percentage could be higher than the one displayed in the table for both national and regional certified slopes (table 8). And this could go for the unapproved ski tracks too; but, either way, the certified slopes would be more numerous for each region, even under the circumstances of adding the 44 unknown status cases to the uncertified tracks.

The status criterion also highlights the most frequently encountered hierarchical order, bringing to prominence, on the one hand, Centre, West, South and North-West regions, and, on the other hand, Maramureş (12 certified tracks) and Cluj (6 certified tracks), as best providers for winter sports and mountain tourism developing possibilities.

In the same train of thought, by combining the previously criteria ranks also emerges the possibility of estimating the tourism potential of Romania's ski areas, mainly based on the ski tracks' number, area, length, number of cable transportation means and other facilities meant to ensure the optimal conditions for winter sports enthusiasts (fig. 6).

It turned out that although most of the ski areas have a low potential (71.8%), the other third compensates for what it is left to be better exploited. Moreover, due to the closely positioned high rated potential ski slopes, the top 10 Romanian tracks follow, in patches, a random order: Sinaia (Prahova), Poiana Brașov (Brașov), Straja (Hunedoara), Azuga (Prahova), Voineasa (Vâlcea), Râncea (Gorj), Predeal (Brașov), Păltiniș (Sibiu), Șureanu (Alba), Cavnic (Maramureș).

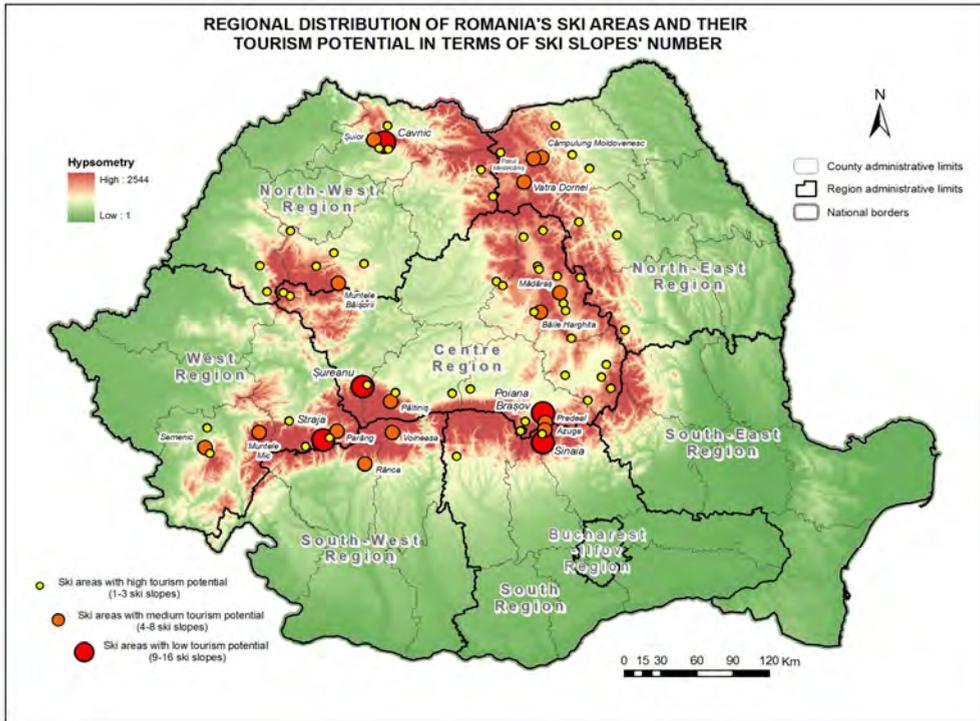


Fig. 6. Ski areas tourism potential in Romania according to the number of ski slopes.

3. CONCLUSIONS

Despite the fact that 27 counties from 7 development regions in Romania are covered by Carpathian Mountains, providing favourable conditions for mountain tourism, winter sports potential remains underexploited even if the evolution has tripled its value for most ski areas and slopes parameters. However, if the trend of the past 15 years continues to maintain its progress, by 2030, Romania could pride itself with more than 450 ski tracks, a total surface of 1720 ha of the entire ski domain, a total length of 490 km of ski slopes and more than 560 cable transportation units. This way, Romania would ensure the optimal valorization of its winter tourism potential and would definitely attract more tourists, whose spendings would be finally reflected on the overall economic growth of the visited mountain areas, counties and development regions.

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THE REENACTMENT AS TOURISM EXPLOITATION THROUGH HERITAGE INTERPRETATION OF HERITAGE SITES IN TRANSYLVANIA

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ABSTRACT. – **The Reenactment as Tourism Exploitation through Heritage Interpretation of Heritage Sites in Transylvania.** Beside the need of reviewing up to date the theoretical progress in the field, we aimed at reviewing the challenges the reenactment performances in Romania have to face as presented in the literature. Another aim of this paper was to furnish an inventory of all tourism objectives in Transylvania where heritage interpretation in the form of reenactment is performed as a form of tourism exploitation of numerous sites. Another objective of this paper was to investigate the main issues of audience's expectations regarding the performance of reenactment at Romanian historical tourism sites and issues practitioners have to challenge in their relatively recent activity. No theoretical meta-analysis or literature review paper on theoretical progress was found. The theoretical preoccupations for unifying the terminology and conceptualization seems to date since the Gotteborg (2012) Conference *Re/theorisation of Heritage Studies*, but from 2012 the interest in theorization was increasing, being visible in the number of papers published per year in peer-reviewed indexed journals. The results on the Romanian context were consistent with previous works stating that audience's expectations, in their nature and information content, were very diverse. Half of the subjects investigated through semi-structured interviews and questionnaires assessing the expected level of satisfaction with the reenactment performance and the actual level of satisfaction after the performance showed positive differences. The (historical) reenactment represents a viable modality of heritage interpretation in Romania and an efficient mean of tourism exploitation with positive results especially for the citadels in Transylvania.

Keywords: *reenactment, heritage interpretation, live interpretation, heritage tourism, cultural heritage*

1. INTRODUCTION

The increasing adaptation of heritage interpretation in exploiting heritage tourism resources is paramount in order to meet the expectations of the new generations of tourism consumers like the Millennials, "the C Generation" (but not limited to). The (simplistic) direct contact between heritage artefacts from ancient civilizations and tourists do not accomplish the expected transfer of knowledge about the cultural value, the

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grandiosity, the symbolism that usually the interpretation facilitates (Mălăescu, 2014). This is especially the case in mass tourism, with the so-called "accidental cultural tourist" and "the occasional cultural tourist" (McKercher and Du Cros, 2002, p.33) visiting significant heritage sites. This imperative was dramatically acknowledged not just by the heritage sites administrators, but also by museum administrations and even larger organizations and institutions. For example for a country with a very complex cultural heritage like Canada the simple transfer of knowledge about the historical various contexts and multiple cultural backgrounds to the younger generations became a challenge that probably made them sphere head in heritage interpretation good practices. Facing the new context with visitors highly embedded in technology and visual arts the heritage interpretation diversified rapidly. The so called designed heritage interpretation moved to multimedia equipment in order to recreate various historical contexts, then switched to augmented reality equipment and SP applications, virtual 3D representations, video-guides and audio-guides using GPS determination of visitor' position in a site (Liberty-guide type). Each year the developers of new heritage interpretation software meet with interested parties like site and museum administrators in order to increase the intensity of visitors' tourism experiences in a heritage site during the annual event of Mediterranean Exchange of Archaeological Tourism (BMTA).

Another way of increasing the intensity of visitor's experience with a heritage site, especially when means of designed heritage interpretation like those mentioned before are not available, consists in live heritage interpretation most frequently performed through tourism animation, reenactment or simply heritage interpretation performed by the guide. In this case, the whole challenge of message transmission drops into performers' job description.

The interpretation, in its narrowed sense of interpretation of cultural heritage, could be defined as a way of communicating to visitors the value, the cultural significance and the interest which the heritage in question brings, a learning activity through are communicated the stories and ideas behind the presented heritage, which provoke the audience to think in itself, to form its own understanding of what that heritage means to them (Heritage Lottery Fund, 2013). Hems and Blockley since 2006 draw attention about the fact that the challenge consist in finding ways of recreating and explaining the larger historical context rich in symbolic content behind the formal structures of the monuments, ruins, castles and historical houses or landscapes. The aim is to challenge the a-priori tourists' representations and encourage a more intensive involvement. The means to carry on this desiderate could be temporary ones such an artistic project or community theatre, story-telling or reenactment. These could also constitute manners to acknowledge the existence of visitors' perspectives on the monuments' significance besides those of the archaeologist, the architecture historian and to entangle new ways of understanding the heritage or involving the visitors. (Hems and Blockley, 2006). Interpreting heritage in a cultural site using tour-guides, cultural animators, reenactment performances or community theatre represents the most frequent way of putting in act the so called live heritage interpretation often opposed to "designed interpretation" in order to avoid the pejorative term of "dead interpretation" (Howard, 2003, p.260).

Reenactment (historical reenactment) represents an activity through the participants recreate certain aspects of an (historical) event or a historical period (Guha, 2009). Designed and delivered in the same time as educational activity but also as leisure activity, considering the tourist interest for this heritage interpretation, the reenactment fulfill in the same time the recreational function, but also the implicit educative function of cultural tourism (Mălăescu, 2014). Another conceptualization of reenactment consists in seeing it as an active role-play (Mălăescu, 2014), consisting in the reconstructing certain historical events, as battles or feasts, rituals or living scenes from the past. Historical reenactment needs a certain location, usually a public park used for bringing to life scripts from the past by certain organization called reenactment societies (Hunt, 2004).

Elements of reenactment can be traced back in time since Romans which used to reenact their most important battle fields or conquests during certain public feasts. Continuously until the 18-19th century, reenactment was largely present in Europe, with England as sphere head with its Elington Tournament. In the 19th century the reenactment activities reached a larger popularity, and starting from the second half of the 20th century, reenactment competitions emerged, especially in North America, starting with the Reenactment of The Civil War (eventplan.co.uk). However, despite the large involvement of the practitioners, the theoretical interest in this heritage interpretation branch grew slowly. The EBSCO journals data base listed for the 1941-2014 period a number of 72 peer reviewed journals' articles with *reenactment* in title and *heritage* in abstract. SCOPUS data base, indexing journals just from 1983 returned 89 articles published between 1983-2015 in peer-reviewed journals when searching using *reenactment* and *heritage* and *interpretation* in *title, abstract and keywords* fields (fig. 1). The majority of articles indexed in EBSCO database in august 2015 have an USA university affiliation of the authors (29 articles) followed by RUMB affiliation of the author (11 articles) results consistent with the longest interests of the practitioners in the area. Authors from Australia, Canada and Russian Federation follow with 3 articles per country, the list ending with other country affiliation with less than 3 articles per country. Only one article from Romania (and published in a Romanian journal) was found.

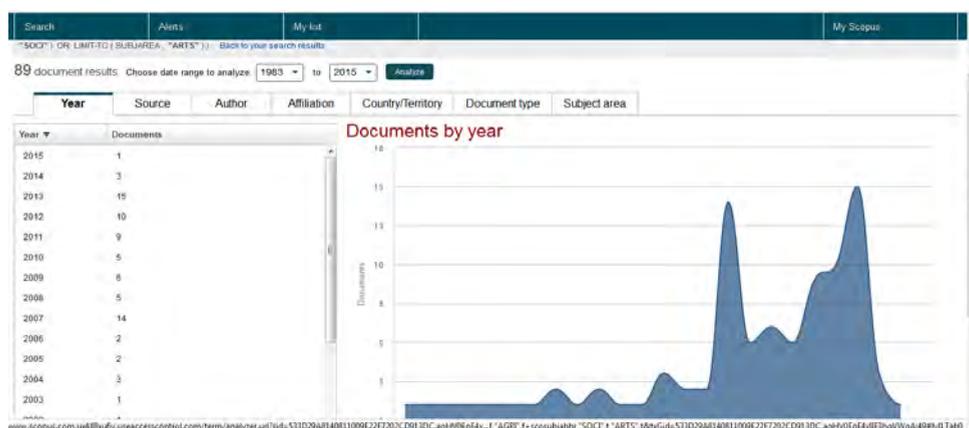


Fig. 1. The dynamics of articles published in SCOPUS indexed peer-reviewed journals regarding reenactment issues during 1983 – 2015 period (SCOPUS Data base analysis, 2015).

No theoretical meta-analysis or literature review paper on theoretical progress was found. The theoretical preoccupations for unifying the terminology and conceptualization seems to date since the Göteborg 2012 Conference *Re/theorisation of Heritage Studies*, although several previous workshops (usually held before or during a practitioners meeting for an reenacting event) announced similar aims: *Symposium on the current state of performance art* (Kassel, 2006), The Fourteenth Civil War Symposium and Reenactment (Cantigny, Illinois, 2011), Civil War Symposium & Reenactment (Cameron, 2013) etc. The increasing interest in theorisation from 2012 was visible also in the number of papers published per year in peer-reviewed indexed journals (Fig. 1).

The majority of scholar papers and handbook on reenactments still pertain about issues regarding the practicalities of the performance like the balance authenticity-tourists' entertainment (Erickson, 2015; D'arcens, 2011; Gapps 2009, Decker, 2009; Dudley, 2009), the impact of different practices and voices interpretation (van Dijk et al., 2012, Crang, 1996), the importance of reenactment groups' ideology and discourse in performance (Hawkey, 2014; Decker, 2009; Norman, 2009; Dudley, 2009), mutations in site interpretation (Hurt, 2010), the roles and functions of material reproductions or substitutes of historic artifacts in reenactment performances (Auslander, 2013) etc. It is relatively easy to observe that the majority of papers pertain to issues of historical accuracy, the group and designer' ideology, discourse analysis - the act of reenactment is in central perspective and not the tourism phenomenon or resource (except for Hurt, 2010). The act of reenactment is rarely seen from a tourism perspective, and, as found in our study on the practices of reenactment in Romania, the majority of the practitioners with academic background, has an historical background. When the reenactment members are not coming from a historic background but from visual arts, architecture, literature studies etc. the declared mobile underpinning their enrollment in reenactment associations is also the passion for history or the historical periods brought to life. The majority of studies shows that interpretation of heritage sites presents monolithic aspects – meaning a single version of a truth, which, sometimes is manipulated and distorted in order to please and to connect with the audience and prevail a certain ideological perspective (Hall, 1994).

The literature regarding the practices of reenactment in Romania is very limited. We found a single academic paper published in journals indexed in international databases or ranked B+, B or C (Cf. UEFISCDI, 2014). The article analyses reenactments of Modern History in Romania “describing the reconstitution of the uniform and firearms of a border soldier from the Romanian 1st Border Infantry Regiment No. 16 in Orlat, as well as the recreation of the clothing, cold weapons and drill training of a Romanian Landsturm fighter, belonging to the Auraria Gemina Legion, active in the 1848-1849 Romanian Revolution in Transylvania” (Briscu, 2012, p.51). However, in reenacting Romania's past the majority of reenactment actions brought to life the Antiquity and medieval history and according to the knowledge of the interviewed practitioners the beginnings of “modern” reenactment (post-communist representations performed by reenacting associations) in Romania dates back to 2000, when numerous associations and reenacting clubs were founded. The beginning of reenacting representations of the Modern History in Romania was established by Briscu (2012) in 2004. In nowadays Romania this form of heritage interpretation is a work in progress and it is still defining itself, with objectives which

the reenactment associations tend to shape firmly in order to create from this momentary experiments (sometimes proved to be a real success) a constant way of increasing the heritage interpretation experiences in Romanian cultural tourism, a way of reeducating the audience (fig. 2 and 3) and the cultural consumer in this newer direction of reenactment and passion for the national and international history.

The first objective when designing the reenactment moment as live heritage interpretation is represented, in the perspective of many reenactment societies, by the authenticity, the preoccupation for reproducing as most accurate as possible, the script, the language, the materials and costumes near to accurate (if not identical) to the period reenacted. In reenacting, more than in other situations, the need that heritage interpretation manifests itself as an art is more concrete, and as Tilden (1967, 1977) stressed out, in the same manner could be taught or transferred further on.

Analyzing what visitors expect to experience at heritage interpretation through reenactment activities, several authors emphasized the fact that audience's expectations, in their nature and information content, were very diverse (Azoulay 1993, Bruner 1996, Austin 2002 in Poria et al., 2009). Authors classifying heritage sites considering their geographical identity (Howard, 2003) underline the fact that a geographical space possesses multiple cultural identities from different history periods, multiple storytelling perspectives and to reveal the truth and the different "place's spirits". In this respect a monolithic presentation is not enough to cover the different cultural aspects of a site, the truths inside and also not enough for the visitor's expectations. A space possesses a range of multiple significances which deserve to be presented in order to create a complete and genuine vision of that particular space. This argument and this identified need to design and deliver an interpretation which contains different perspective stems from the people's different need to learn about different historical aspects of that particular place.

An experiment conducted in 1997 by Beeho and Prentince in the case of New Lank World Heritage Village (Scotland), conducting interviews with visitors showed that visitors' motivation, expectances and desires were completely different. For example some visitors expected that their visit contain more educational elements, in the same time others expected to feel a more profound emotional experience, an experience to keep them interested without implicating the cognitive component of the entire interpretation (Beeho and Prentince, 1997).

Poria et al. (2003, p.239) classified the audience considering their expectations regarding the interpretation in a heritage site as:

- a. Visitors expecting to have an emotional reaction (to feel a connection with the place, the history, the culture, the place's spirit to feel a emotional reaction to the received information).
- b. Visitors expecting to learn something, to enrich their cultural knowledge, to enlarge their accurate and relevant information about the visited site.
- c. Visitors with other types of expectations.

Beside the need of reviewing up to date the theoretical progress in the field of reenactment in Romania, one aim of this paper was to furnish an inventory of all tourism objectives in Transylvania where heritage interpretation in the form of reenactment is

performed as a form of tourism exploitation of the site. We have limited the research to Transylvania for the reason of its Middle Age and Antiquity heritage not covered by previous papers and its sphere head practices of reenactment. Another objective of this paper was to investigate the main issues of audience's expectations regarding the performance of reenactment at Romanian historical tourism sites and issues practitioners have to challenge in their relatively recent activity.

2. MATERIALS AND METHODS

In order to make an inventory of all tourism sites in Transylvania where the practice of live heritage interpretation is carried through means of reenactment we included in the research all sites where the reenactment activity was more constant than occasionally. For example, if an objective registered one single reenactment performance like in the case of an inauguration of one tourism cultural thematic trail on which it was included, was excluded from the analysis. All data were triangulated by the analysis of three types of data source: internet sites of cultural/historic sites, internet sites and Facebook pages of reenactment associations inventoried in Romania, internet sites and Facebook pages of the events and also field data (from interviewed practitioners, tourists and site administrators). Table 1 describes the location with periodical reenactment performances, the main events with reenactment activities, the principal reenactment association performing at the event and the type of heritage interpretation involved. The events captured in Table 1 are not exclusively linked to the mentioned location because in many cases the same event is held in different locations in Transylvania but due to their periodical character. Also the reenactment associations or group mentioned in column 3 is generic due to the fact that the same event is reenacted by different reenactors, and in one event and location usually performs more than one reenactment association. In order to collect visitors' opinion about the added value reenactment activity brings to heritage interpretation of a particular historical tourism site in Transylvania we have interviewed 15 subjects during the *Academic Historic Festival „In the Name of the Rose”*. We have chosen this particular event to make our study case considering its declared international reenactment character (*“International Historic Reenactment Festival”*) comparing to other cultural/historic manifestations in Transylvania registering reenactment performances (table 1). The semi-structured interviews were conducted after visitors attended a reenactment performance and represented a follow up of an exploratory before-performance short questionnaire assessing their expectations regarding the level of satisfaction with the performance. The same instrument was applied after the reenactment performance in order to compare the expected level of satisfaction with the performance with the actual level of satisfaction experienced.

3. RESULTS AND DISCUSSIONS

Table 1 brings evidence of the lately considerable enthusiasm manifested (by both reenactors and visitors) for recreating historical and cultural events through reenactment in Transylvania: numerous locations, various events in the same heritage site and a large considerable number of reenactment association founded in Transylvania.



Fig. 2. The reenactment of the confrontation with Quinta Macaedonica Roman Legion during a Roman campaign (*Napoca Days*, Cluj-Napoca, 2015 - when Cluj-Napoca City held the title of *European Youth Capital*).



Fig. 3. The reenactment of an antique ritual to Mars during *Alba Carolina Citadel Roman Festival* (Alba Iulia).

Obviously, the audience manifests a positive attitude towards this manifestations, reenactment groups specialize themselves in narrow historical periods they reproduce, diversifying in interpretation, interactive activities, equipment and performances – representing factors of progress in this heritage interpretation form in Romania and proof of aspiration to the professionalism, the level and dedication of the reenactment association with a longer tradition mentioned before at the international level.

Interviews revealed the issues raised by Beeho and Prentince (1997) and Poria et al. (2003): audience expect different things from attending reenactment performances. Although qualitative in its nature the exploratory comparison of level of satisfaction expected-delivered showed that 1/3 of subjects interviewed expected different things from the performance and, as a consequence, were less satisfied with the reenactment performance. Half of the subjects interviewed were or became familiar with the concept of reenactment and what this sort of activities entangles. They considered that the reenactment of a historical period or event is important in heritage interpretation is paramount and represents a way of educating the audience and a manner of conserving the tangible but mostly intangible heritage.

They represents the audience that anticipates and recognize activities through the reenactment performance understanding their significance and cultural and historical importance. Those respondents registered expectations or developed during the reenactment performance a sense of belonging, amusement, empathy, interest or the

surprise of a unique cultural experience, they declared that they were part of a cultural activity both useful and pleasant in the same time. The majority of subjects that declared a positive difference between their expectations and the actual experience declared themselves highly enthusiast afterwards.

Table 1.

**Tourism sites with periodic reenactment activities
in Transylvania (Romania) by type of heritage
interpretation form**

Location	Event	Association/ reenactors group	Interpretation type (live or designed interpretation)
Alba Carolina Citadel	<i>Roman Apulum Festival, Gemina Legion Days</i>	<i>Garda Cetății Alba Carolina</i>	Live Interpretation (LI) : Guard change ceremony
Cetatea de Baltă	<i>Dacian Citadels' Festival</i>	<i>Virtus Antiqua</i>	Live and designed Interpretation (LI, DI): gladiators' fights, work- shops, religious rituals, dances, slaves fair, equipment' presentations
Sibiu Citadel	<i>Medieval Festival Transylvanian Citadels</i>	<i>Cavalerii Ordinului Transilvaniei</i>	LI: theatre, dances, equipment' presentations, fights
Mediaș Citadel	<i>Mediaș-Medieval Citadel Festival</i>	<i>Anacronism Group</i>	LI: medieval Templars fights, equipment' and costumes presentations (ECP)
Cluj Citadel	<i>Rebirth of the Cita- del Festival, Napoca Days, Antic Napoca</i>	<i>Gladius Dei</i>	LI: medieval sword fights, medieval dances (MD)
Cetatea Fetei	<i>Live History hour</i>	<i>Ordinul Cavalerilor de Mediaș</i>	LI: tournaments, fights, fighting equipment' presentations, MD, interactive workshops (IW)
Porolissum	<i>Porolissum Festival, Roman Porolissum Festival</i>	<i>Ordinul Dragonilor de Transilvania- Cluj</i>	LI, DI: civil and military medieval heritage presentations, medieval, ECP, medieval crafts and gastronomy workshops (MCGW), experimental archaeology (EA)
Râșnov Citadel	<i>International His- toric Reenactment Festival Râșnov</i>	<i>Asociația Terra Dacica Aeterna</i>	LI, DI: EA, medieval fights (MF), Dacians and Romans fights, ECP, MCGW, roll-ups with historical data
Făgăraș Citadel	<i>Medieval Făgăraș Citadel Days</i>	<i>Nimfele Daciei</i>	LI, DI: Dacian rituals and dances, presentation posters
Ulpia Tra- iana Sarmi- zegetusa	<i>Open Gates Day Ulpia Traiana Sarmizegetusa</i>	<i>Străjerii Coroanei din Brașov</i>	LI: MF, ECP, crafts workshops (CW)

Location	Event	Association/ reenactors group	Interpretation type (live or designed interpretation)
Sighișoara	<i>Medieval Sighișoara Fest</i>	<i>Amicii Muzeului-Zalău: Cohors III Campestris Civim Romanorum Milliaria Eqvitata, Legio VII Gemina Felix Pia Fidelis, Nvmervs Palmyrenorum Porolissensivm Sagittariorvm Civicm, Grupul Daciei, Magna Sarmatia</i>	LI: presentation of military and civic Dacian and Roman costumes, fights, parades, CW, IW
Hunyads Citadel	<i>Antic Hunedoara Festival</i>	<i>Asociația 6 Dorobanți</i>	LI, DI: XIX-XX th Romanian army equipment' presentations, parades, honorific guard reenactment, boards, posters and flyers on the historical period
Bârsei Citadel	<i>Medieval Knights' Tournament Festival</i>	<i>Regimentul I Artilerie Carol I</i>	LI: Regiments rituals presentation, equipment' and uniform presentation (EUP), parades
Orăștie	<i>2 R Roman Festival and Renaissance Festival, Roman Festival</i>	<i>Ordinul Cavalerilor din Hunedoara</i>	LI: MF, ECP, MD
Cluj- Napoca	<i>Antic and Medieval Festival</i>	<i>Grupul Regimentului 3 Artilerie 1887</i>	LI: Regiments rituals presentation, EUP, parades
Luna de Sus	<i>Dacian Festival</i>	<i>Deutch Freikorps</i>	LI: soldiers from I WW and II WW commemoration, EUP, parades, battles reenactment (BR)
Sighetul Marmației	<i>Aeternus Maramorosiensis</i>	<i>Cavalerii Cetății Bârsei</i>	LI: ECP, tournaments, MD, CW, MF
Costești	<i>Medieval Citadels Festival</i>	<i>Grupul Tradiția Militară</i>	LI, DI: Romanian Army heroes commemoration, Historical-Military Reenactment, heritage reenactment (warcraft, documents, decorations, etc.), ceremonials, parades, BR, EUP, military instruction
Turda	<i>Terra Dacica Aeterna Festival, Dacian Festival-Under the Wolf Sign</i>	<i>Compania Arrany Griff Rend</i>	LI: MF, EUP, street animation, MD
Bistrița	<i>Dacians Citadels Festivalival, Bistriței Medieval Festival Days, Medieval Camp</i>	<i>Ordinul Cavalerilor Artgotica</i>	LI: MD, knights' fights, pyrotechnics

A part of the less satisfied subjects registered a low level of expected satisfaction with the performance before the representation, declaring a lack of familiarity with the concepts due to their first attendance to such an event or to a declared low interest for this kind of activity.

Others declared in the beginning a considerable amount of expected satisfaction but during the performance, due to subjective factors, their level of actual satisfaction dropped but from high values of expected satisfaction to a reasonable level of actual satisfaction after the performance demonstrating a certain amount of appreciation for the cultural value of the act. The expert-amateur subject was also present – they know what to expect and had high expectation fulfilled by the performance. *"The world is thirsty for history, living history which is delivered by story-telling in active voice, with which they could personally connect but unmediated by the internal subjectivism of neither the historian's, neither the reenactor's, neither of the imposing policy of the ruling politics in the moment of the reenactment."* (A.S. Ionescu, PhD., President of "6 Dorobanți" Reenactment Association, Director of Arts Institute, București, 2014³).

3. CONCLUSIONS

The (historical) reenactment represents a viable modality of heritage interpretation in Romania and an efficient mean of tourism exploitation with positive results especially for the citadels in Transylvania. This form of heritage interpretation obtained in Transylvania's case positive results, with an enthusiast reaction from the audience, festivals which included reenacting performances registered better reactions from tourists. Historical reenactment represents an excellent method of preserving, understanding and promoting the respective heritage. Reenacting certain events in a site like Râșnov Citadel represents a viable way of encreasing tourist's level of satisfaction with the cultural experience of visiting the site, bringing to life sentiments of cultural belonging and a way of honoring the ancestors, being in the same time a living history lesson and a ludic leisure outdoor activity.

The results of this research were consistent with the work of Beeho and Prentince (1997) and Poria et al. (2003) showing that the different expectation from a reenactment audience is also confirmed by the Romanian context: people from the same audience expect different things (from emotional experiences to cognitive involvement) from attending reenactment performances.

In nowadays Romania this form of heritage interpretation is a work in progress and it is still defining itself, with objectives which the reenactment associations tend to shape firmly in order to create from this momentary experiments, a constant way of increasing the heritage interpretation experiences in Romanian cultural tourism, a way of reeducating the audience and the cultural consumer in this newer direction of reenactment and passion for the national and international history.

³ Notes from a field interview on the topic of "In the Name of the Rose" Reenactment Festival (Râșnov, 2014).

For increasing this form of tourism exploitation of historical sites, a capital invested in this sector is paramount, professional reenactment associations are also needed, and scholars to design and offer academic expertise in respecting the historical accuracy of the period brought to life are key ingredients for success. The interviewed practitioners declared that from historical perspective, frequently the reenactment performances do not reach the due accuracy in authenticity of historical events reenacted.

However, a multidisciplinary perspective, besides the historical one, is also much needed in order to increase the tourist experience with an historical site. Reenactment performances in a way are already perceived as tourism services but the integration in tourism thematic products where the reenacting performances are key ingredients is still absent. The empowerment of a creative festival tourism industry could create a favorable underpinning platform, when the heritage elements in Transylvania are complex, consistent and well connected with the tourism infrastructure. The necessity of a well promoted tourism product which makes this kind of festivals real successful with continuity and increasing quality in time is also transparent.

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TENDENCIES IN THE CLASSIFICATION AND HIERARCHIZATION OF TOURISM RESOURCES

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ABSTRACT. – **Tendencies in the Classification and Hierarchization of Tourism Resources.** The present study aims to emphasize the similarities, but also the deep differences between the concepts of classification and hierarchization, especially when it comes to their applicability. Apart from the theoretical notions, a model of hierarchization is added at the end of the study. It is created based on the four indicators proposed by SPNT that are discussed in this paper and it also refers to indices of tourism supply and demand, used in order to intersect the study more with the economic side of tourism. The results of the study are illustrated through the application of the model created to Neamț County.

Keywords: *classification, hierarchization, tourism resources, tourism potential.*

1. INTRODUCTION

The matter of tourism resources classification has quite a long history, representing one of the main aspects approached by the old school in the field of tourism. Many writers proposed different models of tourism resources classification created in accordance with their own views. The necessity of these classifications is obvious, because the tourists as well as those who invest in tourism in order to create products have to know what they deal with. But what all these classifications lack is the emphasis on the value of tourism resources, better said, their differentiation according to the criterion of the importance they can have in the eyes of the tourist. Therefore, the starting point of this study is the wish to highlight the fact that too little has been insisted upon hierarchization compared to the attention given to classification, its purpose being to emphasise the ways in which tourism development can benefit from the organization into successive ranks of the "natural and anthropogenic environment's components, which due to their qualities and particularities are acknowledged, submitted and exploited through tourism" (Government Decree no. 58/1998).

Being given the fact that nowadays tourism plays an important role in economy, a hierarchization of the tourism resources can be the answer to the multiple problems the investors, as well as the tourists, are confronted with. From an economic point of

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view, the utility of a hierarchy comes from the fact that it can help establish priorities of investments in tourism, as knowing the areas that are worth investing is essential for the success of a business in tourism. For tourists, on the other hand, such a ranking of tourism resources would mean a better management of their holiday time, because if they are provided with a list of the “top attractions” at their future destination, they could organize their trips in a manner that would assure the best consumption of the products they are offered.

2. DEFINITIONS AND CONCEPTS

Defining the main components of the tourism phenomena proves to be a difficult task, given the diversity of opinions of those interested in the matter. The elements of interest for this study, such as tourism potential or tourism resource, have many different definitions in the geographical literature. On the other hand, processes like classification or hierarchization, which will be clarified for our research, do not change their general meaning when applied to tourism approach.

For example, in the Romanian literature, tourism potential is seen as “the sum of natural, historical-cultural, social-demographical and technical-economic components [...] which present tourism exploitation possibilities and give certain functionality for tourism” (Glăvan, 2006). Other scholars’ definition sees it as “the sum of possibilities that the natural and social environment can provide for the tourism activities, no matter if they are used or not for these purposes” (Muntele, Iațu, 2006). Apparently similar – both definitions emphasize the role of natural and cultural conditions of the destination in further development perspectives of the destination – the first scholar point out that tourism potential is a sum of identifiable elements whilst the following ones point on the immaterial vision of potential seen as possibilities of interaction between different elements.

Both approaches are synthesised in fig. 1 (Bulai, 2013) which represents a theoretical model in which tourism resources, social-economic context and the material base of tourism appear as constituent elements and criteria of the tourism potential.

A more intriguing definition presents the tourism resources as “tourist attractions suitable to be visited, on one side, and raw material that can be directly exploited in tourism activities, on the other side” (Glăvan, 2006). Through this definition it is suggested that a resource, either natural or anthropogenic, can be an attraction in itself (such as a cave, mountain or historical monument) or an element that is able to determine or even

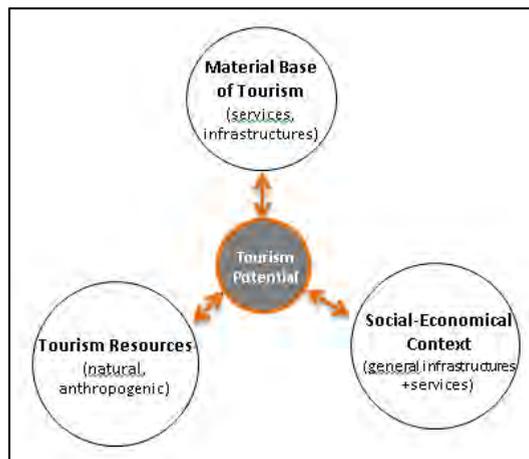


Fig 1. The components of tourism potential.
Source: Bulai (2013)

enhance one place attractiveness either by its capacity to generate a tourism product or by the stakeholders' capacity of further developing and capitalizing it. In this case, snow or mineral waters, for example, are essential for the development of a ski resort or spa facility, of course, if stakeholders have the interest and means to develop it while there is a certain level of demand for it. Thus, tourism potential can be redefined in new terms, as the beneficial relationship between the potential cost of investment in a resource and its capacity to generate further benefits.

Either if we talk about defining them as natural or anthropogenic or about creating other elaborate groups based on the relationships that exist between them, tourism resources have always been classified with the purpose of delineating tourism areas or emphasizing the different types of tourism that exist and the way tourists relate to them. The need of classifying them is also related to their different contributions to the level of tourism potential or to their level of actual capitalization and thus, generation of benefits.

The verb "to classify" means to "arrange or organize according to class or category" (Cambridge Dictionary, 2014). In any classification (as act or process), the central element is the criterion, as the connecting base of all the elements to be organized. The choice of the criterion is up to the author of the classification, which makes it quite a subjective work. The risk lies in the lack of comparability between different geographical elements or aspects and the poor instrumentalization of the process. Many scholars in the field of Tourism Geography tend to use classification as an end in itself as tourism resources are classified in numerous and multiscalar ways but without emphasizing the importance of the differences (Glăvan, 2006; Muntele, Iașu, 2006).

A process that uses the criterion as a fundamental base is hierarchization, derived from "hierarchy", which represents "any system of persons or things ranked one above another" (Cambridge Dictionary, 2014) and has religious roots, the Greek term "hierarchia" referring to the celestial hierarchy and to the ecclesiastical one (The Catholic Encyclopedia, 2014).

The process of "hierarchization" can be more subjective than the "classification" but despite its lack of objectivity, a hierarchy proves to be more efficient than a classification due to the simple fact the studied elements (the natural or cultural resources in this case) are ranked to one another, presenting the idea of a scale of importance, while assigning the resources to classes only helps to connect the ones that have something in common, without revealing the differences that exist between them when it comes to their value.

In tourism studies, models of hierarchization could be applied in many ways, from the star ratings of the accommodation structures to the ratings given by tourists themselves on different travel websites (Trip Advisor, 2014). The criteria used for the two hierarchies above are very different, especially concerning their level of subjectivity, because while hotels are ranked according to some strict standards, ratings that the tourists give are purely subjective, based on the emotions they have experienced at the destination and on their own perception on attractiveness.

3. FROM TOURISM RESOURCES CLASSIFICATION TO HIERARCHIZATION

In the geographical literature, the terms classification and hierarchization do not have the same frequency of occurrence, the tendency of creating hierarchies being far less used than the one of proposing classifications of the tourism resources. One obvious reason for this is the vast amount of work required for the creation of a model of hierarchization, which could hardly be done with the elimination of any shred of subjectivity.

There is not, therefore, a universally accepted model of hierarchization, through which the tourism resources, and by extension, the tourism regions from all over the world, could be evaluated comparatively with the purpose of deciding upon their different levels of importance.

This paper will present some of the tendencies manifested in tourism studies with regard to the classification and hierarchization of the tourism resources, insisting upon the higher utility of hierarchization, but also on the connection between the two methods.

Some scholars (Glăvan, 2006; Swizewski, Oancea, 1977) propose models of tourism resources classification through the complex structure of natural tourism potential, which refers, in fact, to the resources provided by nature that “present an interest for tourism and can be exploited through tourism and technical development”. In his work, Glăvan (2006) manages to enumerate the natural elements that can attract tourists and, therefore, can be transformed into tourism products, but he also admits that “natural tourism potential components participate unequally and differentially to the composition of the tourism potential”, introducing in this way the idea of a necessary hierarchization, but without taking a step in this direction.

Figure 2, which illustrates the classification made by Glăvan (2006) reveals, therefore, an image of what nature puts at disposal of tourism, but their presence on the same level does not leave room to any appreciation of one of the elements as being more attractive to tourists than the others. We face, as stated before, an array of elements brought together by the fact that they all belong to nature and they all represent potential attractions that can be tourism products or can be turned into tourism products.

The classification of tourism resources facilitates the elaboration of a typology of tourism types, its necessity resulting from “the applicative side of the geography of tourism, from practice, which imposes the realization of scientific studies of the typical features, of the relations between the types of tourism phenomena” (Swizewski, Oancea, 1977). Although not a classification of the tourism resources, which represents the



Fig. 2. Classification of natural tourism resources.

Source: Glăvan (2006)

subject of this study, the classification that will be presented as it follows relies on the knowledge of the categories of these resources. Based on the components provided by the natural and anthropogenic environment, Swizewski and Oancea differentiate the structural tourism types, identifying 6 main types: mountainous tourism, health tourism, sport tourism, cultural tourism, commercial tourism and pilgrimage tourism. This typology is determined by the existence of a wide variety of components, such as mountains, mineral waters, sports competitions, cultural monuments, fairs and exhibitions or religious sites, but it is still incomplete, being obvious, for example, the omission of the sea tourism, which represents, without a shadow of a doubt, one of the main types of tourism nowadays, if one refers to the number of tourists it attracts.

When talking about a typology of tourism, Swizewski and Oancea (1977) argue that its theoretical and practical importance “has a scientific side, a didactic side and a practical-applicative side in the economy of tourism, being given the fact that, this way it is open the path of exploitation of new territories where the economy of tourism can and must compensate the insufficiency of other branches of economy”. Still, the typologies proposed are not exactly the best ways of insisting on the practical importance, but only on the theoretical one, this being just a first step in the direction of getting acquainted with the economic side of tourism. Therefore, for example, these typologies do not highlight the areas where there are enough resources, from a quantitative and qualitative point of view, which could have compensated “the insufficiency” just mentioned. The best way of emphasizing these regions is through the elaboration of a system that ranks the attractions to one another by evaluating their tourism attractiveness, which allows a comparison between the resources based on their importance.

The models of classification described above are the root of the attempts that have been made until now to create systems of hierarchization, those who tried to attribute scores to the components that are considered as parts of the tourism potential, starting in their attempts from already existing models of classification.

A model of hierarchization, that could be of interest for this study, and that, first of all, classifies the elements to be taken into consideration, before including them into a hierarchy, is the one realised by the SPNT or Spatial Planning of National Territory (2009) (in Romanian – “PATN” – “Planul de Amenajare a Teritoriului Național”).

The SPNT proposes an evaluation of the tourism potential of the territorial units of Romania, using its own methodology, created by relating to four main indicators: natural resources, cultural resources, tourism infrastructure and technical infrastructure. For each of the variables contained by these indicators it has been established a score (table 1) based on a methodology that the authors did not clarify or motivate. This score has two different compounding methods – a fixed value according to presence or lack of a feature or represents a percentage of the maximum score that has been obtained by the best classified territorial unit. Table 1 only synthesises the maximum value for that resource or class of resource, in order to give an idea of the relative importance given to them. By summing up the indices, the SPNT identifies a value of tourism potential for each territorial unit.

This method of evaluation has the advantages of creating a system that can be applied at a national scale and of taking into consideration all the elements that represent a premise for tourism development. The chosen indices suggest, where the

tourism potential is seen as a sum of tourism resources (a vision close to that of Glăvan, 2006, and Neguț, 2004) - natural and anthropogenic resources and general and tourism infrastructure, which are included in the social-economic context and the material base of tourism that appeared in the graphical representation presented before.

Anyway, this model is prone to criticism, a main drawback being the “disproportions in scoring each index, under- / over-representations of certain indicators or lack of taking into consideration new tourism attractions or facilities” (Iașu, Bulai, 2011). One notices first the difference between the scores received by the tourism and general infrastructure, as it is difficult to understand why the lowest score corresponds to the first one, when the existence of accommodation structures, first of all, but also of the leisure and treatment facilities is an essential condition for the existence of any tourism destination.

Another disadvantage of a hierarchy resulted from this methodology is the fact that the summing of the values of all the indices with the purpose of determining the tourism potential may hide the particularities, and therefore the deficiencies of the analysed areas. For example, in figure 3, both Roman and Ceahlău are represented as areas with a high tourism potential. Nonetheless, the tourism indicators are very different. In Ceahlău the natural resources are significant, with a score of 15, due, first of all, to the topography represented by mountains, while Roman is characterized by a score of 4 at the same category. What the second territorial unit compensates with is the score it receives for general infrastructure, 24 out of 30, which, without being as important as the existence of the tourism resources themselves in the activity of tourism, has a great influence on the final image of the distribution of areas with high tourism potential. It is then difficult to assess the consequences of such appreciation of scores for the future

Type	Variables	Basic Indicators	Max pt.
Natural Resources (max. 25p)	Natural environment	Relief/Topography	4
		Geomorphology	1
		Vegetation	1
		Wildlife	1
		Waters	1
	Natural factors	Landscape	2
		Mineral spa waters	10
		Therapy lakes	
		Therapy mnd	
	Mophets, sulphurous		
	Protected areas	Biosphere reserves	5
Nanonal parks			
Other reserves			
Cultural Resources (max. 25p)	Historical monuments	Archaeology	8
		Architecture	
		Monuments	
		Memorials	
	Museums	Museums/ Public collections	9
	Arts and crafts	Traditional events, customs, handicrafts	8 or 4
Cultural institutions	Philharmonic, orchestras, choirs etc	8 or 4	
	Events	Festivals, holidays	0/4
Tourism infrastructure (max.20p)	Lodging	Hotels, guesthouses, camping, campsites, motels, bungalows, etc.	7
	Treatment	Installations	5
	Conference halls	Conferences, congress, exhibition halls	6
	Leisure facilities	Ski slopes	1
		Cable transportation	
Other leisure facilities	Golf courses, water-ski entertainment parks, horse riding, beaches	1	
General infrastructure (max. 30p)	Accessibility to transport network	Harbour /Airport	1/5
		European road	5
		National road and/or railways	5
	Household equipment	Running water, sewerage	5
		Natural gas	4
	Telecom	Mobile phone coverage, Landlines	5

Table 1. Variables and indicators used in the evaluation of tourism potential (adapted from SPNT document, 2009)

investments (capitalization and overall further development) and that will make the object of further discussions. When thinking of an investment in leisure tourism (leisure is still perceived by many as the core-motivation for tourism), Ceahlău will be chosen by most of investors, while only some investors in business facilities will choose Roman. When looking at statistics, in 2013, in Ceahlău municipality, a total capacity of 1332 beds have produced 29016 overnight stays while in the municipality of Roman only 324 existing beds have produced 34788 overnights. Of course, small rural guesthouses in Ceahlău have a difficult monitoring system of statistical data (so the actual numbers are a lot higher) but still, this shows us that further discussion is needed when dealing with terms like Tourism Potential.

Another criticism that can be brought to the SPNT methodology is the fact that the attractiveness of the cultural resources is not contextualized, for example all the monuments have received the same score, without being differentiated by the criterion of their historical importance.

This method has also another two other weaknesses: "First, summing up natural and cultural resources might not be relevant as their degree of impact on the territory (such as visitor overnights or currency incomes) is completely different. Second, a resource (i.e. mountain gorges or a protected area) does not always need tourism infrastructures (such as accommodation facilities) on the same territorial unit as their significance for tourism often relies on their relative isolation or wilderness" (Iașu, Bulai, 2011).

When assessing tourism attractiveness, we may also use online hierarchization, which nowadays plays an essential role in the decisions the tourists make. There are travel websites with databases on destinations where people write reviews and rate the places they have visited, their scores being a clear image of how tourists make their own hierarchies, relevant and useful, indeed, for giving the following potential tourist an image of the choices he has, but with one main drawback: their deep subjectivity.

We choose as object of analysis the website TripAdvisor®, through which more or less experienced tourists contribute to the creation of the image of most of the tourist destinations of the world, by two apparently simple actions: reviewing and rating. Nonetheless, not as simple are the consequences these actions can have upon the future tourist flows in the reviewed areas, because the image the reviewers create can be either positive or negative, which translates as either a rise in the number of tourists that visit a certain destination, or, on the contrary, a decrease.

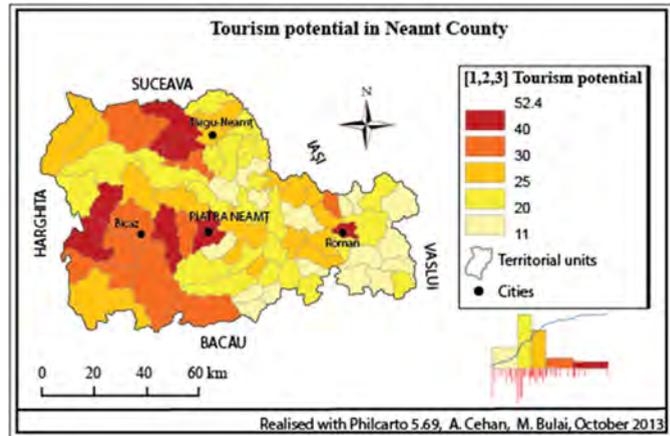


Fig. 3. Tourism potential score in the territorial units of Neamț County. *Data source: SPNT (2007)*

It all depends on the impression a certain destination, hotel or restaurant made on the reviewer himself, the top-rated attractions being decided not based on the number of reviews they receive, which could also give an idea of the number of tourists that visited a certain destination, but on the rating the reviewers gave to the element analysed.

The method that literally determines the creation of a hierarchy is that of the rating, through which every evaluated component receives a rank, but the impact the description made has on the future tourist qualifies these reviews as methods of subordinating the destinations to one another too.

Besides deciding over the rating, by relating to a scale that goes from “Terrible” to “Excellent” and sharing your “first-hand experience”, as a reviewer you can also offer technical details about what you chose to review, such as whether a fee is perceived or not, the length of the visit or the facilities the attraction owns.

To the credibility of the ranks the destinations have, comes the information about the reviewers, which refer mainly to the experience they have, seen in the number of reviews they wrote, but, more important, in the number of “helpful votes” that are connected to their names, this being in fact the proof of the relevance of the hierarchies created and of their utility, because having their review seen as helpful means that they had potentially a strong influence over the tourists trip plans.

The drawbacks of this kind of hierarchization are found in its subjectivity and in the fact that it does not cover all of the tourism regions with all their destinations and tourism structures. The first disadvantage comes from the fact that anyone can become a reviewer, sharing his own experiences and presenting the destinations seen through his eyes making it impossible for that person to keep a high level of objectivity. It may, therefore, be also a matter of chance for a destination to be highly ranked, for if the reviews for a certain destination come mostly from people who happened to have some bad experiences at the place, especially when there are not many reviews posted, the average of the ratings will lean towards the inferior limit of the rating scale. The anonymity of the reviewer could also encourage the ill-intended people, who could create a distorted image of the destination, hotel or restaurant for personal reasons, or could determine, for example, the accommodation structures to “buy their customers’ good opinion”, even if this good opinion is not founded on good services and experience.

As for the second disadvantage, the hierarchies created are not complete due to the fact that not all the destinations, hotels or restaurants from a certain region are taken into consideration, this aspect being dependent on the travel experience of the members of the website. More precisely, a destination may not appear as an attraction from a given region on the website only because none of its members (as previous travellers to that region) wrote a review for it by different potential reasons – type of destination, type of tourist, penetration of TripAdvisor into some markets etc. This aspect may compromise the accuracy of the ranks given to the destinations.

From all the aspects exposed above it is obvious that the importance of classifications in tourism cannot be denied, because before deciding that one tourist attraction is more important than another, or, more precisely, that it has a higher level of attractiveness, the knowledge of the tourism resources that are at the base of all

tourism activities is essential. But what can be criticized is the absence of more attempts of ranking tourism resources to one another in order to give an exact image of the actual situation in tourism and subsequently, a more accurate assessment of tourism potential of different territories.

This image could mean a better understanding of which resources are the most attractive, and therefore it can reveal the areas with the highest tourism potential, a step that can be useful for the prioritization of investments in tourism. This prioritization would apply, more exactly, in the cases when, for example, either there will be regions with significant resources, but with a low representation of the tourism or/and general infrastructure, or areas where the score is high for all the indicators, but they are simply not catching the attention of the tourists, which suggests, as well, the existence of a problem. In both cases the investments are not just necessary, but also desirable for the investors, because these regions would not be lacking tourism attractiveness, but only appropriate infrastructures to sustain the tourism activities around the natural or anthropogenic resources, or, in the second situation, adequate advertising.

Not less important, hierarchies are “instruments of decision” for tourists, bringing to their knowledge which the “must see” attractions are, and, in general, how much a destination is worth being visited.

The aspects presented above introduce the idea that the number of tourists that visit these attractions is relevant in the creation of a hierarchy of the tourist attractions, because the importance of a destination is decided, after all, with reference to those it is addressed to, MacCannell defining the tourist attraction as a relation between the tourist, the destination to be seen and the elements of information about the destination.

Starting from MacCannell’s definition (cited by Moreau, 2001) and from the ideas suggested above, that valuable tourism resources and well developed infrastructures are not always equivalent to top-visited destinations, we made an attempt of illustrating the importance of the hierarchization in tourism, and moreover the importance of correlating the indicators taken into consideration by SPNT with the number of tourists attracted to a certain destination.

4. NEW HIERARCHIZATION OF TERRITORIAL UNITS IN NEAMŢ COUNTY

In order to highlight the economic importance of hierarchies in tourism industry and to show that a connection between the tourism supply and demand indicators is more relevant in illustrating and evaluating the attractiveness of a territory, we created a model of hierarchization that takes into consideration not only the four indicators chosen by SPNT, but also two demand indices: arrivals and overnights. The result of the correlation we made was a hierarchical ascending classification (a hybrid between classification and hierarchy), through which groups were formed based on the similarities between the territorial units with regard to the analysed variables. Each group is characterized by an average for each variable. The average is different in every case from the general average, calculated by taking into consideration the scores from all the territorial units of the county.

The choice of the region to be analysed was determined by the diversity of the territorial units with concern to their tourism potential, as Neamţ County is characterized by a wide variety of ways in which the mentioned variables interact.

The mapping of resulting hierarchic classes emphasizes the main advantages of this method, the most important one being the fact that it gives the possibility of ranking the territorial units using more than one criterion, the correlation between all the supply indicators and some of the demand ones revealing a regionalisation of tourism features of the county.

It is easy, therefore, to notice the particularities of every territorial unit, by analysing the profiles of classes, which represent a method of comparison between the classes on a general level, but also by referring to every variable in particular.

The comparison between the classes, and inclusively, the decision upon their positions in a hierarchy could be most easily done, in this case, by analysing the classes two by two, as they are almost opposite to one another. A first group of two consists of classes 1 and 2, corresponding to Tourism Centres, such as Piatra Neamţ, Târgu-Neamţ, Ceahlău and Bălătești, respectively, to the Interstitial Areas with no tourism perspectives. These will be, obviously, the top and the last categories in the hierarchy, the first one being characterized by high scores in the case of all the indicators, while in the second class there is not even one variable with the value over the county's average, the communes from this class representing the areas of risk in tourism investments.

Classes 3 and 4 are similar when it comes to their position on a hierarchical scale, but each of the classes is characterized by its own "tourism fingerprint", being, in this aspect, opposite to one another. The group of Highly Attractive Accessible Destinations, in which Bicaz and Roman are included, benefits from some tourism resources, but their advantage comes from their highly developed technical infrastructures and access, which corresponds to an important number of arrivals and overnights.

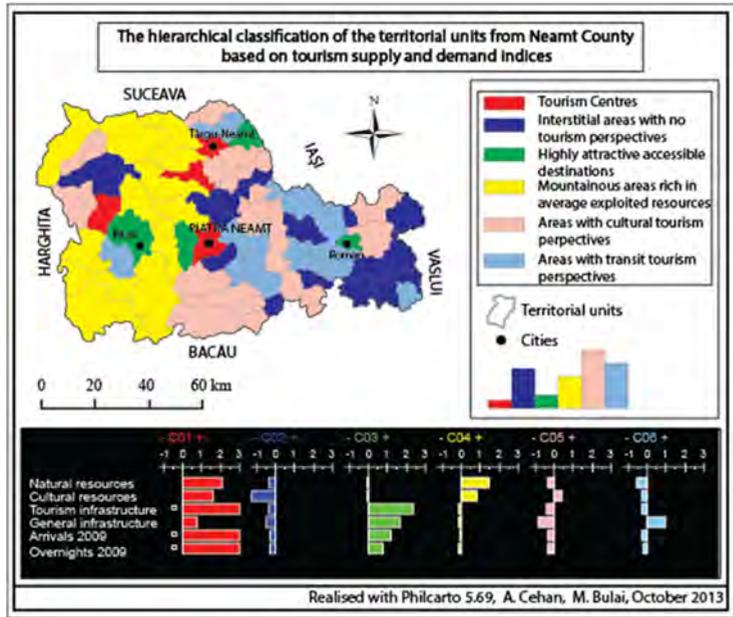


Fig. 4. The hierarchical ascending classification of the territorial units in Neamţ County. Data source: SPNT 2007, INSE.ro

This situation may only suggest that in many cases, the tourist attraction itself does not have to be extraordinary, as long as the destination is efficiently represented by technical and tourism-specific infrastructures. On the other hand, the destinations belonging to the class of "Mountainous areas rich in average exploited resources" can be noticed mainly in the West of the county and they are, as their name says, first of all, characterized by natural resources, whose value is not adequately exploited, this lack of exploitation, suggested by the low number of arrivals and overnights, being caused by poor tourism and technical infrastructures, but, at the same time, being also the factor of the absence of these infrastructures. This means that while not having some of the mountainous regions of the county on the list of the most visited destinations could be a consequence of them being hard to reach destinations, their lack of publicity, which prevented them from coming into tourists attention, could also be the one which portrayed these areas as worthless of investments.

The last two classes illustrate the cases of the areas with almost no tourism activities, these classes sharing a similar low position in the hierarchy and including areas with a moderate risk of investment. Although the tourism perspectives are close to being non-existent, in both cases there are possibilities of future development that could be taken into consideration. Class 5 has the advantage of some cultural resources, which could benefit from a higher level of interest from the investors or potential visitors and could generate future tourism products. The proximity of the tourism centres and of the attractive regions may play as strength, as main tourist flows could be diverted towards these areas of lower, but not insignificant attractiveness.

On the other hand, the strength of class 6 is represented by the general infrastructures, the little tourism activities practiced in the region being based on the proximity of the main road axes. It is clear, therefore, that these are areas with transit tourism perspectives, the next step in their development being to invest in the tourism-specific infrastructures, as the transit tourism by definition only seeks to offer accommodation facilities for tourists who have to travel a long way to their tourism destinations.

Therefore, the model of hierarchical ascendant classification analysed above does not only refer to what an area has to offer, but it also correlates the offer with the number of tourists attracted by it. This may also reveal the level of management of tourism resources and the efficiency of capitalization. Another utility of this method comes from the fact that, as it can be observed when compared to the map on which is represented only the tourism potential, through hierarchization results a more homogeneous image of the county, being easier to identify areas of possible cooperation in tourism, as can be noticed Tazlău Valley (southern county), belonging to class 5 or Bistrița-valley axis (crossing the county from Northwest to Southeast) which is part of class 6. These areas are, therefore, characterized by values of the tourism offer and demand and having the same deficiencies means that they have, more or less, the same possible alternatives of development. Thus, collaboration between these territorial units may be a solution for all the parties concerned.

5. CONCLUSIONS

Being given the emphasis that has been placed on these aspects before, it will suffice to reiterate that a system of subordinating the tourist attractions is not only a method of presenting the current situation concerning the tourism offer and the way tourists relate to it, but it is also a tool that may be of help in predicting the future of tourism in a certain region. Moreover, this has an important role in designing its future, as knowing what position a destination has in a hierarchy is essential for figuring out how it could accede to the top of that hierarchy.

Our study emphasises that there is an excessive use of classification nowadays in the Romanian geographic literature and a need to instrumentalize it by hierarchization in order to effectively transform it into tools of decision and means for prioritization of investments in tourism (especially for public investments).

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