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1

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CUPRINS - CONTENT - SOMMAIRE - INHALT

GR. P. POP, N. CIANGĂ, The Doctoral Studies at the Faculty of Geography, „Babeș-Bolyai” University of Cluj-Napoca, between 2005 and 2012 * <i>Doctoratul la Facultatea de Geografie, Universitatea „Babeș-Bolyai”, Cluj-Napoca, în perioada 2005-2012</i>	5
ANCA AFLAT, IOANA CIOBAN, CLAUDIA CRISTEA, V. PETREA, Recent Trends in River Morphodynamics of Turnu Roșu – Călimănești Sector * <i>Tendențe recente în morfodinamica fluvială a sectorului Turnu Roșu - Călimănești</i>	21
M.M. NISTOR, Geological and Geomorphological Features of Kenai and Chugach Mountains in Whittier Area, Alaska * <i>Caracteristici geologice și geomorfologice în Munții Kenai și Chugach din regiunea Whittier, Alaska</i>	27
GH. ROȘIAN, The Law of the Order of Watersheds * <i>Legea ordinii interfluviilor</i>	35
MARIA CHIVULESCU, Morphometric Aspects of Cărcinov Basin (Cândești Piedmont) * <i>Aspecte morfometrice ale bazinului Cărcinov (Piemontul Cândești)</i>	47
ALINA-DACIANA DUMITRA, Structural Measures Against Flooding in Cluj and Dej Hills * <i>Măsuri structurale împotriva inundațiilor în Dealurile Clujului și Dejului</i>	55
BOGLÁRKA CZELLE CZ, D. PETREA, Mineral Water for Treatments: Summarized Presentation of the Bathing Culture * <i>Apa minerală pentru tratament: prezentare rezumativă a culturii balneare</i>	63
CAMELIA BIANCA TOMA, I.A. IRIMUȘ, Therapeutic and Tourism Recovery of Microclimate from Praid and Turda Salt Mines * <i>Recuperarea terapeutică și turismul datorat microclimatului din salinile Praid și Turda</i>	75
B. ERDEM, N. TETİK, A New Trend in the Hotel Industry: Ecolodges * <i>O nouă tendință în industria hotelieră: ecohotelurile</i>	85
ALINA SIMONA SIMION, The Tourism Capitalization of the Hydrographic Potential in “Maramureș Land” Depression Area by Means of Rural Tourism * <i>Valorificarea turistică a potențialului hidrografic din aria depresionară a Țării Maramureșului prin turism rural</i>	93

I. BOLD, IOANA-RALUCA CORPĂDEAN, Land Law and its Impact on the Rural Space in Romania * <i>Legea funciară și impactul său asupra spațiului rural din România</i>	101
DANIELA-LIVIA GHEORGHIȘ, The Classification of Rural Settlements on Feleacu Hill * <i>Clasificarea așezărilor rurale de pe Dealul Feleacului</i>	113
RODICA PETREA, C. FILIMON, LUMINIȚA FILIMON, V. NEMEȘ, Post Communist Functional Changes in Romania's Small Towns. Case study: Beiuș Land (Bihor County) * <i>Schimbări funcționale post-comuniste în orașele mici din România. Studiu de caz: Țara Beiușului (județul Bihor)</i>	119
L.C. STOIAN, ANDREA GAGYI-PALFFY, D. PETREA, I. RUS, O.L. MUNTEAN, I. DANCI, VIRGINIA IOANA SCROB, Cluj-Napoca Urban Growth from 1250 to 2012. A Geographical Information System Approach * <i>Cresterea urbană în Cluj-Napoca în perioada 1250-2012. O abordare prin prisma sistemelor informaționale geografice</i> ...	133
R. RUSU, T. MAN, C. MOLDOVAN, The GIS-Based Road Distance and Time Connectivity Index of the Settlements within the West Region of Romania * <i>Indexul de conectivitate rutier în funcție de distanță și de timp al așezărilor din regiunea de Vest a României calculat pe baza GIS</i>	141
AL. GAVRIȘ, Social Vulnerability in Bucharest: An Exploratory Spatial Data Analysis Approach * <i>Vulnerabilitatea socială în București: o abordare exploratorie prin analiza datelor spațiale</i>	151
CAMELIA-INA GAVRA, RADA VARGA, Genesis and Evolution of the Cultural Landscape in Metaliferi Mountains * <i>Geneza și evoluția peisajului cultural din Munții Metaliferi</i> ...	167
M. HOTEA, The Shepherding in the Maramureș Mountains and its Role in the Local Development * <i>Păstoritul în Munții Maramureșului și rolul său în dezvoltarea locală</i> ...	179
SILVIA IRIMIEA, The Development of the Romanian Vocational Education and Training System * <i>Dezvoltarea sistemului românesc de educație și formare vocațională</i>	185
P. KATONA, Z. BUJDOSÓ, The Attraction Area of the University of Arts of Târgu Mureș * <i>Aria de atracție a Universității de Arte din Târgu Mureș</i>	199

Notes and Book Reviews – Note și recenzii

AL. PĂCURAR, The correspondence of Nicolae Dragomir with his master George Vâlsan and with Constantin Brătescu * <i>Corespondența lui Nicolae Dragomir cu magistrul său George Vâlsan și cu Constantin Brătescu (inedită)</i>	207
SILVIA IRIMIEA, Leadership and Management in Vocational and Education Training * <i>Conducere și management în educația și formarea vocațională</i>	219
I. IANOȘ, N. POPA, ANDREEA-LORETA CERCLEUX (2011), <i>Éléments de planification territoriale et développement régional [Elements of Territorial Planning and Regional Development]</i> , University Publishing House, Bucharest, 282 p. (AL. PĂCURAR)..	223
A.A. BALTĂLUNGĂ (2008), <i>România. Orașele porturi dunărene: geografie umană și economică [Romania. The Danube Port Cities: Human and Economic Geography]</i> , Cetatea de Scaun Publishing House, Târgoviște, 323 p., 78 illustrations, 18 tables, 50 photographs, 6 annexes. (AL. PĂCURAR)	227
N. CLIFFORD, S. FRENCH, G. VALENTINE (eds.) (2012), <i>Key Methods in Geography</i> , second edition, London, Sage, 545 p. (IOANA-RAMONA ILOVAN)	229
I. BOLD, A. CRĂCIUN (2012), <i>Organizarea spațiului agricol. Concepte – Tradiții – Istorie (Organization Of Agricultural Space. Concepts – Traditions – History)</i> , Mirton Publishing House, Timișoara. (V. SURD. T. MARIAN, IOANA-RALUCA CORPĂDEAN) ..	231

THE DOCTORAL STUDIES AT THE FACULTY OF GEOGRAPHY,
„BABEȘ-BOLYAI” UNIVERSITY OF CLUJ-NAPOCA,
BETWEEN 2005 AND 2012

GR. P. POP¹, N. CIANGĂ¹

ABSTRACT. – **The Doctoral Studies at the Faculty of Geography, „Babeș-Bolyai” University of Cluj-Napoca between 2005 and 2012.** This study continues a series of studies which have been published since 1972, as it comes out from the bibliography mentioned at the end of the paper. Regarding this situation, without getting too much into details, it must be said that the first analyses, those published in *Lucrări științifice* (at Oradea), took into account the situation of the doctoral studies at national level. Afterwards, our attention focused only on the analysis of the doctoral activity in the field of Geography in the city crossed by Someșul Mic River. As for the present approach, the main motivation for performing this study was determined by the numerous changes that occurred in the doctoral activity in Romania and therefore also in the field of Geography at Cluj-Napoca. Such changes were: the setting up of the Institute of Doctoral Studies at the level of the university and the Doctoral School at the level of the faculty and the limitation of the doctoral period from „unlimited” before 1990 to six years in the next period and then (since 2005) to three years. The current approach has in view the general assessment of the doctoral activity at the Faculty of Geography within the „Babeș-Bolyai” University of Cluj-Napoca between 2005 and 2012. The following basic characteristics are analysed: the introductive aspects, the manner of evolution of this activity, the PhD coordinators, the registration and defense of the PhD theses, the subjects and territorial structure etc. Regarding the contents of the study, in a very general synthesis, one may note the following. There are 12 university professors who coordinate PhD theses. They gradually achieved this status, starting from 1990 (Grigor P. Pop and Ioan Mac) and until 2009 (Claudia Popescu). The doctoral activity is presented by nominating the PhD candidates, the titles of their theses, the year of registration and the year of defense of the theses, for every PhD coordinator (table 1). The mentioned situation allows the presentation of a few general aspects, as follows: during the analyzed period, there were 186 enrolled PhD candidates and 141 doctoral theses defended. Their distribution among PhD coordinators was related to the coordinators’ period of activity and the highest numbers are outlined in table 2 and fig. 1. The analysis of the subjects of PhD theses reveals that the highest frequency among the 281 titles belongs to Geomorphology (15.7%), Tourism Geography (15.3%), Meteorology and Hydrology, Environmental Geography and Geographical Risks (each with 13.9%), Population and Settlements (11.7%), Regional Geography (10.7%) etc. The analysis of the territorial structure of doctoral theses indicates that 60.5% of the 281 PhD theses are focused on Transylvania, as expected.

Keywords: *Geography, PhD studies, doctoral school, structure by subject, territorial structure.*

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1. INTRODUCTION

Even since the 8th decade of the 20th century, our interest was partly oriented towards the analysis of the doctoral activity in Romania. In this respect, three papers have been published (Gr. P. Pop, 1972, p. 161-172; Gr. P. Pop, Viorica Rusu, 1973, p. 158-163, Gr. P. Pop, 1974, p. 144-146). As a result of the changes regarding the manner in which doctoral studies developed in Romania, we continued this approach, but only for the Geography on the banks of Someșul Mic River. This was materialized by two papers, belonging to N. Ciangă (*Tiberiu Morariu – coordonator al școlii doctorale naționale*, 2003, p. 36-42) and N. Ciangă, Gr. P. Pop (*Doctoratul la Facultatea de Geografie, Universitatea Cluj-Napoca, în perioada 1990-2005*, 2006, p. 13-22).

Taking into account a few aspects concerning the manner in which the doctoral activity was organized and functioned, one may state the following:

- between 1990 and 2004 there were, in terms of duration and content, two types of education: *full-time*, for four years and *part-time*, for six years. During this period, each candidate had to pass three exams and three essays, and studies were finalized by the defense of the thesis;

- the year 2005 corresponded to the obvious change of the doctoral activity, first of all due to the decrease of its duration to three years. Then, this activity was organized at the level of the university by means of the *Institute of Doctoral Studies* and at the level of the faculty by the Doctoral Schools, one of *Physical and Technical Geography* and the other one of *Human and Regional Geography*;

- in 2010, the two doctoral schools merged, resulting the *Doctoral School of Geography*, while the two fields (Physical and Technical Geography and Human and Regional Geography) were kept;

- the first year of activity of the PhD candidates is developed within the Doctoral School and they attend courses on four or five subjects specific for the above-mentioned fields that have direct implications for their theoretical, informational and methodological preparation;

- at the end of the Doctoral School, the PhD student has the obligation to write and defend a research project. The continuation of the doctoral studies depends on its success;

- afterwards, the doctoral essays became research projects. They include contributions related to data gathering and processing, field research, materials written and defended in front of a coordinating commission of the PhD candidate. The commission also monitors the candidate's activity until the quasi-final defense of the thesis in front of it.

Concerning this paper, it has in view to shed light generally on the doctoral activity at the Faculty of Geography within the "Babeș-Bolyai" University of Cluj-Napoca between 2005 and 2012. The following basic aspects are considered: the PhD coordinators, the matriculation and defense of doctoral theses, their structure by subject and territory. All these issues are clearly presented synthetically in table 1.

2. COMPONENTS OF THE DOCTORAL ACTIVITY

Synthetically, as already mentioned, among the components of the doctoral activity, the following should be assessed: aspects regarding PhD coordinators, the registration of PhD candidates and the defense of PhD theses, their subject and territorial structure etc.

2. 1. PhD coordinators

The coordination of PhD theses at the Faculty of Geography in Cluj-Napoca was made possible even since 1990², tightly related to the manner in which the doctoral activity in Romania was essentially transformed and the accomplishment of the requested conditions to receive the status of PhD coordinator by a number of professors.

The Doctoral Activity at the Faculty of Geography, „Babeş-Bolyai” University, Cluj-Napoca, in the period 2005-2012

Honoured Prof. Dr. Grigor P. POP, PhD Coordinator since 1990

Table 1

Crt. no.	PhD Candidates	Title of the Doctor's Degree Theses	Year registration	Year defense
1	Kovács Leontina	The organization of the geographic space within the Lower Corridor of Arieş	1998	2007
2	Ionescu Nicoleta	Population and settlements of Ciceu, Suplai and Năsăud Hills (Someşul Mare Hills)	1999	2009
3	Tănasă Emanuela	Population and settlements of Mureş Plain (Transylvanian Plain)	2000	2007
4	Ciurean Codin	The inter-Carpathian yoke. Human-geographic functions	2001	2007
5	Mândru Petru	Population and settlements of Someşul Mic Corridor	2001	
6	Rotar Gabriela	Strategies of tourism development in Romania	2001	
7	Raţiu Ramona	Population and settlements of Someş Plain (Transylvanian Plain)	2001	2007
8	Rus Dumitru	Mureş Corridor, Brănişca-Păuliş Sector. Human Geography Study	2002	2005
9	Rusu Oliver	Geographic-historical study of the Neolithic and of the Iron Age settlements from the Transylvanian Depression (neolithic-current)	2002	2011
10	Niţă Adrian	Population and settlements of Braşov Depression	2003	2007

Honoured Prof. Dr. Ioan MAC, PhD Coordinator since 1990

1	Buzilă Liviu Ioan	Processes of meteorism and their effects in the morphology of Bihor Massif	1996	2005
2	Gligor Viorel	The volcanic relief from the North-Western side of the Metalliferous Mountains	1997	2005
3	Blaga P. Lucian	A Study of relational geomorphology within the dynamic systems of Plopiş Mountains	1998	2006
4	Dimen D. Levente	Critical enviromental states. Study case „Zlatna Depression”	1999	2005
5	Pendea T. Ionel Florin	Geomorphological paleoenvironments of the Upper Quaternary in the Transylvanian Depression (Eemian-Weichselian-Holocen)	1999	2005
6	Corpade P. Ciprian	The environmental system of the upper basin of Arieş	2000	2009
7	Filip T. Sorin	Baia Mare Mountains and Depression-Study of environmental geomorphology	2000	2007
8	Negru Radu	The geomorphology of the piedmonts located in the Northern part of Şureanu- Cindrel Mountains	2001	2009
9	Faur Cornel	Oaş Mountains. Geomorphologic study	2001	2007
10	Mic I. Simona Maria	The effect of the physical-geographical factors upon public health in Bistriţa-Năsăud County	2002	2008
11	Vasilescu P. Ileana	Integrated patrimony study. Maramureş Depression	2002	2008
12	Reţeşan-Floca L.A. Diana Lia	Study of the enviromental impacts from „Feleacu Hills” geographical unit	2003	2008

² One should highlight that the doctoral activity at Geography in Cluj-Napoca was interrupted in 1982 due to the passing away of Prof. Tiberiu Morariu, corresponding member of the Romanian Academy.

13	Carhat I. Radu Mihai	The integrated geographic system of the saliferous region from the North-Western area of the Transylvanian Depression. Geographical evaluation and optimisation	2003	
14	Dura V. Nicolae	Ambiental region induced through the manifestations of radioactivity from the Apuseni Mountains	2003	
15	Corpade Ana-Maria	Real environment, perceived environment and human behaviour in Maramureş Depression	2003	2011
16	Reti I. Kinga Olga	The differentiation of the enviromental system in urban structures with critical states in Târnava Basin	2003	2009
17	Roşian G. Gheorghe	Models of functional geomorphology within the valley-hillside system in the Transylvanian Depression	2003	2008

Continuation in the period 2005-2012

1	Stelczner G. Elena-Maria	Perception and enviromental behaviour, premises of an enduring development -Hunedoara Municipality territorial model	2005	2010
2	Irimia I. Ioana	Territorial units of planning and development from Boiu Mare Plateau and Breaza Peak	2006	
3	Bâlc G. Dorina- Florica-Maria	Anthropic relief from the upper basin of Crişul Repede River	2006	2010
4	Forai G. Mihael- Simion	Factors and physical-geographic conditions, premises for development of sports in Rodna, Gutâi, Tibleş, Tomoioaga Massifs	2006	
5	Sabo I. L. Helena-Maria	Comparative analysis of enviromental education in Germany and Romania	2006	2008
6	Tudosescu G. George-Valentin	The transcarpethian valley of Olt River, a study of applied geomorphology	2006	
7	Sabău P. Simona-Corina	Vlădeasa Massif - study of applied enviromental geography	2007	
8	Buloga V. Mariana	The geographical landscape from Crişul Repede hydrographic system	2008	
9	Marcus Army	Implemetation of Sustainability Education Among Elementary School Students by Activating the „Green School” Program	2008	2012
10	Bogdan V- Corina	Silvania Mountains, a study of integrant and comparative Geomorphology	2010	

Prof. Dr. Pompei COCEAN, PhD Coordinator since 1995

1	Covaciu. T. Angelica	Chioar Land. A Study of Regional Geography	1998	2006
2	Pâle Luminiţa	Beiuş Land. A Study of Regional Geography	1998	2007
3	Man Titus	Regional approaches in GIS technology	1999	2008
4	Nagy Egon	Romanian-Hungarian crossborder regions	1999	2008
5	Josan Ioana	Silvania Land. A Study of Regional Geography	2000	2007
6	David Nicoleta	Zarand Land. A Study of Regional Geography	2000	2008
7	Mara Vasile	Giurgeu and Ciuc Depressions. A Study of Regional Geography	2001	2009
8	Boţan Cristian	Motî Land. A Study of Regional Geography	2002	2008
9	Ilovan Oana	Năsăud Land. A Study of Regional Geography	2004	2008
10	Barta Andras	Critical geographical phenomena in Someşul Mare Hills	2004	2010
11	Conţiu Andrea	Regional axes of gravitation of the Târnave	2004	2010
12	Vescan Iuliu	The sustainable development of Mureş-Arieş area of convergence	2000	2007
13	Pavel Horaţiu	Almaş Land. A Study of Regional Geography	2004	2010
14	Papp Lelia	The center-periphery relation within the urban part of Cluj County	2004	

Continuation in the period 2005-2012

1	Drăgan Magdalena	The resilience of Apuseni Mountains regional system	2005	2011
2	Pop I. Ana-Maria	Bârsa Land. A Study of Regional Geography	2005	2009
3	Benedek V. Rozalia	Geographical and economic disparities in the NW Region	2006	
4	Drăgan G. Daniela	Cluj-Napoca Municipality- A Study of Medical Geography	2006	2010

THE DOCTORAL STUDIES AT THE FACULTY OF GEOGRAPHY, BETWEEN 2005 AND 2012

5	Gingulescu Maria	The skiable potential of Romania	2006	2010
6	Ianăș I. Ana-Neli	Almăj Land. A Study of Regional Geography	2006	2010
7	Marc S. Mihaela	The impact of the climatic changes upon tourism in the Basins of the Mediterranean Sea and the Black Sea	2006	2011
8	Borogean Elena	Lovișteea Land- A Study of Regional Geography	2007	2010
9	Popa F. Lăcrim.-Florinela	Transylvanian migrations in the Getic Subcarpathians. Geographic and Historic Study	2007	2012
10	Vasilița Cristina	Cultural landscapes in Someșul Mare Hills	2008	2012
11	Faur R. Camelia-Ina	Cultural landscapes in the Metalliferous Mountains	2008	2012
12	Lazăr Adina	Trascău Mountains - Geo-ecological Study	2008	2011
13	Mureșan Alexandru	Vrancea Land. A Study of Regional Geography	2008	2012
14	Vilcea Cristiana	Severin Land.A Study of Regional Geography	2008	2011
15	Cioanca I. Lia-Maria	Geographical risk phenomena in Bărgău Mountains	2009	
16	Ciangă N. Iulia	Urban landscape in the Transylvanian vedutism	2010	
17	Cimpoieș Paula-Olivia	Făgăraș Land. A Study of Regional Geography	2011	
18	Mihalca Amalia	Dorna Land. A Study of Regional Geography	2011	
19	Spănu Smaranda	The built patrimony of Transylvania as heterotopy	2011	
20	Darlaczi Timea-Melinda	Bărgău Land. A Study of Regional Geography	2011	
21	Hognoci Gavrilă	Hațeg Land. A Study of Regional Geography	2012	

Honoured Prof. Dr. Vasile SURD, PhD Coordinator since 1995

1	Nicoară V. Vasile	The influence of the ethnogeographic factors in the development of settlements in Dobruđa	1998	2005
2	Covaci I. Iosif	The rural space of the area of influence of Baia Mare Municipality	1999	2005
3	Dohotar V. Vasile	The geographical space organisation and territorial planning within the upper basin of Vișeu	2000	2008
4	Rusu Raularian	The geographical space organisation of Banat	2000	2006
5	Stănică Viorel Ion	The impact of the territorial administrative and political codes concerning the organization of the geographic space and the arranging of the national territory in the modern and contemporary era	2000	2006
6	Dohotar N.I. Cristina	Alba Iulia-Turda Corridor. A study of the geography of the settlements	2001	
7	Iuga I.V. Ion	The tourist organization of the geographical space in the Eastern Carpathians - the Northern Group	2002	2009
8	Puiu Viorel	Geographical risks and the spatial organisation of the Middle Corridor of Mures River (Deda-Alba Iulia Sector)	2002	2006
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12	Erchedi N. Nicoleta Maria	Moți Land. A study of social geography and rural development	2004	2012
13	Moldovan Ciprian	Iara-Hășdate Depression. Territorial planning	2004	

Continuation in the period 2005-2012

1	Alexandru V. Diana-Elena	Structural modifications of the rural space from Romania as a consequence of the implementation of the european SAPARD financial plan	2005	2009
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14	Dobrei Gabriel-Cristian	Deva-Hunedoara Conurbation. Study of Applied Geography	2008	
15	Misachievi Adriana	Population and settlements of Sibiu Depression	2008	2011
16	Corpădean Raluca	Huedin Micro-region. Resources and local development	2009	2012
17	Giurgiu V. Laura-Călina	Resources and local development in Iara-Hășdate Depression	2009	
18	Scridon A. Ioana	The Zipser communities in Europe. Geographical Study	2009	2012
19	Bacaluz Z. Mihael-Corneliu	Geo-economic, geopolitical, social and cultural impact of the Romanian Diaspora	2009	
20	Moyal Haim	Habitat Selection and Geography of Birds in Israel	2009	2012
21	Bruckner A. Leonard	Tureni Village (Cluj County). Micro-territorial analysis	2010	
22	Puşcaşu Adina-Maria	Copăceni Village (Cluj County). Micro-territorial analysis	2010	
23	Bulacu V. Alexandru	Retezat Mountains. Tourism planning and management	2010	
24	Todor R. I. Daniel-Reimund	The settlements and the geographical space organisation in Bistra Corridor	2010	
25	Corpodean Gabriel	The tourism infrastructure in Apuseni Montains	2011	
26	Cocean A. Pompei	The Romanian bee keeping. Geographical Study	2012	
27	Tudorache Claudia	Târgu Jiu Municipality. A Study of Urban Geography	2012	
28	Țăruș V. Raisa	The population of the cities from Transylvania. Geographical study	2012	
29	Vrabete I. Mihaela	Planning and decision in the implementation of the territorial development	2012	

Honoured Prof. Dr. Victor SOROCOVSCHI, PhD Coordinator since 1999

1	Alexe Mircea	A study of the salt lakes of the Transylvanian Depression	1999	2007
2	Fodorean Ioan	A study of the fresh water lakes of the Transylvanian Plateau	1999	2007
3	Holobacă Iulian	The unprofitable periods under the pluviometric aspect and their hydrologic effects in the Transylvanian Plateau	1999	2006
4	Bătinaș Răzvan	The study of the quality of the surface waters in Arieș catchment area	2000	2007
5	Vig Melinda	The quality of the water of the rivers belonging to Târnava catchment area	2000	2007
6	Vodă Mihai	The effects of the household water works upon the fluid drainings in the hydrographic basin of the Târnava	2000	2006

THE DOCTORAL STUDIES AT THE FACULTY OF GEOGRAPHY, BETWEEN 2005 AND 2012

7	Arghiuş Viorel	Hydrological risk phenomena in the eastern region of Apuseni Mountains	2001	2007
8	Conţiu Hadrian Vasile	A study of urban hydrology in Mureş Corridor between Reghin and the confluence with Arieş	2001	2006
9	Szocs Aniko	Hydrochemistry and the pollution of the rivers within the upper and middle basins of Mureş	2001	2010
10	Mureşan Cristina	A study of urban hydrology in Turda-Câmpia Turzii Depression	2003	
11	Ştef Iulian Ioan	Drainage lakes located in Sebeş hydrographic basin and their influence upon the water drainage	2003	2010
12	Făt Daciana Alina	Hydrological risk phenomena in Almaş-Agrij Depression and in Cluj and Dej Hills	2004	
13	Raduly Daniel	A study of hydrological risks on Târnava Mare, Târnava Mică and Niraj Rivers, within the space of the Transylvanian Subcarpathians	2004	
14	Horvath Csaba	The study of the clogging of the lakes from the upper basin of Crişul Repede River	2004	2008

Continuation in the period 2005-2012

1	Chiaburu V. Mioara-Ramona	The integrated evaluation of the hydrological risk phenomena in Bistriţa Hills	2005	2010
2	Sanislai Daniel	The risks induced by the excess of water in Someş Plain	2005	
3	Spânu C. Simona	The pluviometrical regime of Cibin hydrographic basin and the effects induced on the geographical environment	2005	2008
4	Popa Oana-Antonia	The study of liquid leaking from Tur drainage basin	2006	2010
5	Cigher V. Marius	The identification and evaluation of the hydro-tourist potential of Arieş drainage basin upstream of Buru	2008	2011
6	Toma N. Florentina-Mariana	Extreme hydrological phenomena in the Romanian Plain between Olt and Argeş	2008	2011
7	Minoiu M.C. Anca-Ştefania	The study of high floods on the rivers from Gilort hydrographic basin and associated risks	2008	2011
8	Goron N.G. Nicoleta-Daniela	Hydrological risk phenomena and processes of mass movements in Mureş County. Case study	2009	
9	Zaharia V. Constantin-Sorin	The risks induced by floods and landslides in Lăpuş drainage basin upstream from the confluence with Săsar	2009	
10	Beşuţiu V. Marius Valentin	Hydromineral resources from the northern region of the Transylvanian Depression	2010	

Honoured Prof. Dr. Virgil SURDEANU, PhD Coordinator since 2001

1	Arghiuş Corina	Codru Range and Piedmont. Geomorphological study	2001	2010
2	Hosu Maria	Someş Valley between Dej and Ţicău. Geomorphological study	2001	2007
3	Mureşan Alexandru	The geomorphodynamics of the valleys from the western slope of Maramureş Mountains	2001	2008
4	Oliniuc Mariana	The geomorphological determination for the urban development of Chişinău Municipality	2001	
5	Cherecheş Aurel	The relief of the mountain area of Romania. Its influence regarding the planning and development of military actions	2002	2005
6	Popescu Marius	The relief built on loess in the Romanian Plain, South from Ialomiţa River	2003	
7	Poszet Szilard	Study of applied geomorphological study in the urban Cluj-Napoca region	2003	2011
8	Goţiu Dana Elena	Geomorphological risk processes in Haţeg Land	2003	2007
9	Man Ioana	Contemporary geomorphological processes in the Iara-Săvădisla-Vlaha Depression	2003	
10	Anghel Titu	Strategies of rehabilitation of the anthropic relief caused by mining exploitation. Case study: Motru basin	2004	2009

11	Balazsi Krisztina	Strategies of rehabilitation of the anthropic relief caused by mining exploitation. Case study: Baraolt mining basin	2004	
12	Dulgheru Marius	The dynamics of the river beds in the Transylvanian Plain	2004	
13	Pop Olimpiu Traian	Comparative geomorphological study between Căliman (Romania) and Sancy (France) volcanic massifs	2004	
14	Ardelean Mircea	Piule-Iorgovanu Mountains. Geomorphological study	2004	2010

Continuation in the period 2005-2012

1	Manea Ș. Ștefania-Anemaria	Relief, determining factor in the development of the territory. Case study: the upper and middle basins of Strei Valley	2006	2011
2	Pandia I. Iulia	The evolution of the minor and major beds of Someș River	2007	
3	Păsărescu Lucian	Processes of contemporary shaping in Olteț Basin	2007	
4	Roman L. Marieta	The role of vegetation in the rehabilitation of the degraded terrains (Case study: Maramureș Depression)	2007	
5	Cocean P. Gabriela	The relation between relief and tourism in Trascău Mountains	2008	2011
6	Moldovan Monica	„Glimee” in Transylvania – Geomorphological study	2008	2012
7	Simea I. Ioana-Maria	Avalanches of Rodna Mountains	2008	2012
8	Buimagă-Iarinca I. Ștefan	Applied geomorphological research on road infrastructure. Case study: Transylvania Highway	2009	2012
9	Gavrilă Georgiana	The relief-tourism relation in Măcin	2009	2012
10	Blaga I. Cornel	Extreme climatic phenomena and geomorphological hazards in Cluj County	2009	
11	Mate Ș. Marta	Strategies of rehabilitation of the anthropic relief generated by mining activities. Case study: Deva-Hunedoara metropolitan area	2009	
12	Veza S. David	Processes of contemporary shaping in Căndrel Mountains	2011	
13	Jurj I. Maria-Adina	Tourism – an alternative of development within the mining space of Roșia Montană-Abrud area	2012	

Prof. Dr. Nicolae CIANGĂ, PhD Coordinator since 2002

1	Hotea Mihai	Maramureș Mountains. A study of human geography	2002	2008
2	Pătrașcu Cristina	Piatra Craiului Area–Rucăr-Bran Corridor. A geographical study of sustainable development by tourism	2003	
3	Ionașcu Viorel	Dobrudja. A study of Tourism Geography	2003	2008
4	Costea Daniel	The balneary tourist potential of the salt waters of the Transylvanian Depression and their capitalization	2004	2008
5	Tolescu Irinel Ionuț	The capitalization of the tourism potential of the upper basin of Arieș with emphasis on sustainable development	2004	
6	Costea Cornel	Bărgău Mountains. A Study of Human Geography	2004	
7	Holircă Constantin	Ciuc Depression and its area of mountain gravitation. Geodemographic study	2004	

Continuation in the period 2005-2012

1	Kurko M. Ibolya	Geodemographic and economic disparities in Romania during the transition period	2005	2009
2	Mălăescu D. Simona	The Subcarpathians located between Olt and Jiu. A study of social geography with emphasis on the transition period	2005	2008
3	Bradea V. Vasile	The characteristics of the tourism activities from the North-Western development region of Romania	2005	
4	Mathe Laura-Alexandra	The anthropic tourist potential in the South-West of Transylvania (Alba, Hunedoara counties) and its capitalization	2006	2010
5	Sima T. Ioana-Gabriela	Geodemographic study regarding Petroșani and Hațeg Depressions (within the context of the social and economic changes specific to the period of transition)	2006	

6	Muscalagiu M. Arabela	The cultural tourism potential of the cities situated in the Transylvanian Depression and its capitalization.	2006	2011
7	Szabo F. Barna	Leisure tourism in the Central Group of the Eastern Carpathians	2006	2010
8	Gherman P.V. Adriana	The capitalization of the natural and anthropic tourist potential of Căliman and Gurghiu volcanic massifs	2007	2010
9	Gherțoiu D. Mihai	New forms of tourism developed after 1990. The niche tourism in Romania	2007	
10	Măran P. Petru	External migration in Maramureș Land. Case study – migration for work to Spain	2007	
11	Șeptelean Elvira	The geography of education in Cluj-Napoca Municipality	2007	
12	Berkessy Philipp	Complex rehabilitation of surface mining (quarries) exploitation. Comparative study Köflach-Austria, Laustz – Germany, Aghireșu-Romania	2007	2011
13	Oprea M. Marius-George	The impact of the development of the transportation infrastructure upon tourism in Transylvania	2008	2012
14	Altman S. Iacob	The tourist potential and efficient capitalization in NW Transylvania	2008	
15	Mateș I. Adela	The phenomenon of deindustrialization from the period of transition and the impact on the geodemography and habitat in Hunedoara County	2008	2012
16	Marinescu V. Ana	Tourism in the southern part of Transylvania. The European tourism dimension of the heritage belonging to the German community	2008	
17	Rus I. Claudia	The Maramureș household and traditional activities. Tourism brands	2008	
18	Talpasi Janos	Uval tourism in Transylvania	2008	
19	Tofan G. George-Bogdan	Small basins, factors for the humanisation in the Central Group of the Eastern Carpathians. Case study: the northern part of the elongated basin (Drăgoiasa-Glodu-Bilbor-Secu-Borsec-Corbu-Tulgheș)	2009	2012
20	Bobășu V. Alexandra	The group of Parâng Mountains. A Study of Tourism Geography	2009	
21	Rusu I. Daniela-Livia	Feleacu Hill – A Study of Rural Geography	2009	
22	Koszinski N. Sorin-Alin	Crossborder projects and sustainable development in Maramureș Land	2009	
23	Cozea I. Florina Doruina	The capitalization of the tourism heritage of Cluj-Napoca Municipality and of its metropolitan area	2010	
24	Rahovan G. Armela-Linda	Hotel establishments and their impact on tourism in Transylvania	2010	
25	Kerekes G.E. Gabor	Tourism literature in Romania. Case study: travellers handbooks	2010	
26	Groza-Bîja P. Carmen-Daniela	The organisation of the activities and the involvement of the tourist projects of development in Sălaj County	2011	
27	Raduly A. Lenke	Rural tourism and sustainable development in Sfântu Gheorghe Depression	2011	
28	Macxim I. Romana	Sustainable tourism planning in Chioar Land	2011	
29	Popescu T.V. Antoaneta-Carina	The capitalization of the tourism potential of the Subcarpathians located between Olt and Motru	2011	
30	Schuster M. Eduard	German settlements situated in Apold-Orăștie Corridor (Underwald). A study of historical geography	2011	
31	Trombitas J. Jenő	The Transylvanian Plain. A study of Agricultural Geography	2011	
32	Bătea G. Cătălina-Maria	Crossborder tourism in the North-West part of Romania (Satu Mare and Szabolcz-Szatmar-Bereg Counties)	2012	
33	Burtini Dino	The mobility of the population Transylvania-Italy. A Study of Anthropology and of Tourism Geography	2012	

34	Oneţ N. Maria-Cristina	The tourist organisation of the geographical space in protected mountain natural areas. Case study: Apuseni Mountains Natural Park	2012	
35	Porumb-Ghiurco V. Cosmin-Gabriel	The tourism image of Transylvania	2012	

Prof. Dr. Ionel HAIDU, PhD Coordinator since 2004

1	Bilaşco Ştefan	The implementation of GIS in shaping the slope high floods. Case studies in Someşul Mic basin	2004	2008
2	Keller Iulius Eduard	Evaluation and simulations of the water flow in risk situations with the help of GIS. Application to Baia Mare Municipality	2004	2008
3	Maier Narcis Ciprian	The study of the atmospheric instability and of the radar echoes with the purpose of achieving the „now casting” type forecasts, of the precipitations and temperatures. Case study in Someşul Mic basin	2004	2011
4	Lupău Călin Mircea	A study regarding the implementation of GIS within the management of the advertising activity. Application to Oradea Municipality	2004	
5	Mureşan Florin Ioachim	A study regarding the geographic information system in the management of the fixed and circulating means from the public health care system of Bihor County	2004	2010

Continuation in the period 2005-2012

1	Mateescu A. Marcel-Lucian	Statistical study of time series of climatic parameters in Europe: the analysis of cycles according to the Wavelet method	2005	2011
2	David S. Bogdan-Simion	The Romanian instrumental climatic data - do they indicate a climatic change?	2005	2010
3	Magyari-Saska L. Zsolt	The development of a GIS algorithm for the calculation of natural geographic risks. Applications to the upper basin of Mureş River	2005	2008
4	Crăciun I. Augustin-Ionuţ	The indirect evaluation with the help of GIS of the soil humidity with the purpose of shaping the pluvial high floods. Applications in Apuseni Mountains	2007	2011
5	Marian G. Radu-Alexandru	A geoinformatics study regarding the hydric impact of the deficiencies of the water supplying networks from the rural environment. Application in Baia Mare Depression	2007	
6	Văduva I. Bogdan	A geoinformatics study of simulation of the pluvial torrents aggressiveness. Applications in Apuseni Mountains	2007	
7	Domniţa A. Matei	Runoff modeling using GIS. Application in torrential basins in the Apuseni Mountains	2008	2012
8	Nicoară G. Elena Monica	A study regarding the implementation of GIS in the management of the emergency situations in case of floods. Application on the communes located in the contact zone of Gilău Mountains - Someş Plateau	2008	2012
9	Costea A. George	The influence of the climatic variability and deforestations on fluid leakage, studied by means of remote sensing	2009	2012
10	Tudose M. Traian	Characteristics of the intensity of rains in the North-Western region of Romania	2009	
11	Gyori L. Maria-Mihaela	GIS assessment of the pluvial high floods in the small basins situated on the right side of Mureş (Apuseni Mountains Sector)	2010	
12	Mureşan I. Ioana-Maria	The study of high floods from the small basins without hydrometric measurements. Applications to Apuseni Mountains	2010	
13	Ivan C. Kinga	Cluj-Napoca - urban hydrology study in the context of present climatic characteristics	2012	
14	Moldovan D. Dumitru-Lucian	The study of natural risks as restrictive factors of tourism activities in Căliman Mountains	2012	
15	Torpan V. Adrian	The morphometric and risk assessment of mountain routes in Gurghiu Mountains for the planning of orienteering activities	2012	

Prof. Dr. Jozsef BENEDEK, PhD Coordinator since 2007

1	Ureche O. Cornelia	Patterns of organization of tourism activities in rural space. Comparative study Romania – France	2007	
2	Danel A Erika	The process of suburbanisation of the economic functions in Cluj-Napoca Metropolitan Area	2008	2012
3	Mathe F. Csongor	Geographic study of the transportation network in the Centre Region of Development	2008	2011
4	Blaga D. Oana-Elena	The urban network in Alba County	2009	
5	Horvath B. Ana	The impact of the European politics of cohesion upon the regional development in Romania	2009	
6	Cristea E. Marius	Applications of the growth pole concept and theories on the setting up of development policies	2010	
7	Cozma Ş. Luiza-Tunde	Territorial disparities of the tourism supply in Romania	2010	
8	Cocheci R.V. Vlad-Nicolae	The impact of the demographic changes upon the residential function within Cluj-Napoca metropolitan area	2011	
9	Luca D. Vlad	Interconditionings between economy, environment and society in Baia Mare area	2011	
10	Nicoară G. Flavius-George	Urban-rural relations in the area of influence of Bistriţa Municipality	2011	
11	Bajtalan C. Hunor	Territorial governance regional development in Romania	2012	
12	Nagy Julia-Angela	Sustainable urban development in the metropolitan area of Cluj	2012	
13	Vicsai Nora Csilla	Intra-regional disparities in North-West Development Region	2012	

Prof. Dr. Ioan-Aurel IRIMUŞ, PhD Coordinator since 2007

1	Apolzan Nicolae-Cosmin	Ampoi Valley– A study of fluvial geomorphology	2007	
2	Cristea Claudia	Sieu Valley. A study of applied geomorphology	2008	2012
3	Neagu G. Maria-Luminiţa	Natural risks and the sustainable development in Gurghiu morphohydrographic basin	2008	2011
4	Sofia G. George-Cristian	Cerna morphohydrographic basin (Hunedoara County) – structure and functions of the geographical landscape	2008	
5	Szilagyi A. Jozsef	Natural risks and sustainable development in Reghinului Subcarpathians	2008	
6	Constantinescu Robert	Quantitative methods of evaluation of the volcanic hazards in densely populated areas, with emphasis upon pyroclastic flows. Case study: El Misti and Arequipa city in South-West of Peru	2009	2012
7	Danci I. Ioan	Geomorphological risks in Cluj metropolitan area	2009	2012
8	Toma T. Camelia-Bianca	Geomorphosites on salt in the Transylvanian Depression and their tourist capitalization	2009	2012
9	Vieru V. Ioana	Associated natural hazards and risks in Tarcău morphohydrographic basin	2009	2012
10	Blaga Irina	The effect of precipitations upon the morphodynamics of the mountainous and hilly space of Cluj County	2010	
11	Măguţ F. Flavia-Luana	Geomorphological and technogenic risks associated to the technostructures in Baia Mare Depression	2010	
12	Irimia D. Daniel-Nicu	The tourist capitalization of geomorphosites in Buzău Subcarpathians	2010	
13	Togănel Szigeti M.D. Cristian-Tiberiu	The morphology, dynamics and planning of Târgu Mureş Municipality urban space	2010	
14	Vâtca Andreea-Maria	Zalău Municipality. Morphology and planning of the urban space	2011	
15	Deac I. Simona-Octavia	Cluj-Napoca Municipality – morphology, dynamics and esthetics of the urban landscape	2011	

16	Lehene-Moigrădean I. Gențiana-Oana	Risks associated to geomorphological and hydrological processes in Crasna Basin	2011	
17	Ilies I. Monica	The role of meteorism in the regional differentiation of the wood and rock monuments in Transylvania	2012	
18	Roșu C. Cătălina-Elena	Morphology, dynamics and planning of the urban space in Piatra Neamț Municipality	2012	
19	Rus I. Mădălina-Ioana	Almaș Valley. A study of applied geomorphology	2012	

Prof. Dr. Petrea DĂNUȚ, PhD Coordinator since 2008

1	Aflat C. Anca	Hazards, vulnerability and associated risks in Olt Valley (Racoș-Călimănești Sector)	2008	2012
2	Petrea-Tuluc C. Viorel-Florin	The morphodynamics of the major river beds of lower rank in Crasna basin within the context of extreme hydrological events	2008	2012
3	Stoian V. Laurențiu-Cristian	The anthropic impact upon the quality of the environment in Cluj-Napoca Municipality	2008	2011
4	Csiszer T.S. Levente	Baraolt Depression - integrated study of physical geography	2008	
5	Czellecz A. Boglarka-Timea	Patterns of tourism development in areas providing recreation. Case study: the western border of Harghita Mountains	2010	
6	Mathe E. Emoke	Hazards and natural risks in Someșul Mare Valley	2010	
7	Iacob Ionuț-Ciprian	Fractality and entropy in the large cities of Romania	2011	
8	Roșca I. Sanda-Maria	Niraj Basin – A Study of Applied Geomorphology	2011	
9	Ionescu D. Claudia Thora	The role of strategic environmental evaluation in territorial planning. Case study: the North-West Region	2012	
10	Raică D. Maria-Daniela	The karst and its role in the geographical space organisation of Northern Oltenia	2012	
11	Sima N. Andrei-Nicolae	The vulnerability of human settlements in Vișeu Basin	2012	
12	Văidean A. Augusta-Roxana	Debris flows in the Metalliferous Mountains. Geomorphological Study	2012	

Prof. Dr. Claudia-Rodica POPESCU, PhD Coordinator since 2009³

1	Răducanu I. Gelu	Medical Geography Study in the North-Western Region	2009	
2	Carzon O. Radu-Sorin	Sustainable development of cultural heritage tourism in Transylvania	2010	
3	Mihalca T. Radu-Adrian	Sustainable development of rural tourism in Lăpuș and Chioar Lands	2010	
4	Bosioc P. Georgiana-Andreea	Territorial cohesion and urban regeneration in Turda-Câmpia Turzii urban concentration	2011	
5	Șoflău A. Bogdan-Cătălin	The Upper Prut Euroregion, a geopolitical and geo-economic analysis of a crossborder region at the periphery of the European Union	2011	
6	Todor N.A. Cătălina	The influence of the demographic factor in geopolitical relations. Case study: Romania	2011	
7	Benedek M. Erzsebet-Timea	Urban development and and creative economy. Case study: Cluj-Napoca	2012	
8	Lupoiu G. Oana-Georgiana	Economic restructuring and urban development in the regional growth pole of Brașov	2012	
9	Nicula Gabriel-Cătălin	Mining and sustainable development in Arieș Valley catchment area	2012	

³ Bucharest Academy of Economic Studies.

Gradually, 12 university professors achieved this status of PhD coordinators, starting with *prof. Grigor P. Pop* and *prof. Ioan Mac* (1990), then continued with *prof. Pompei Cocean* and *prof. Vasile Surd* (1995), *prof. Victor Sorocovschi* (1999), *prof. Virgil Surdeanu* (2001), *prof. Nicolae Ciangă* (2002), *prof. Ionel Haidu* (2004), *prof. Jozsef Benedek*, *prof. Ioan-Aurel Irimuş* and *prof. Petrea Dănuţ* (2007) and *prof. Claudia-Rodica Popescu* (2009).

2. 2. Registration of PhD candidates

During the analyzed period, it recorded an intensity according to the specificity and manner of organisation of the doctoral activity. Generally, there was an increase of the number of PhD coordinators and an even larger increase of the number of places granted each year for PhD candidates for this higher form of scientific performance and the **Doctoral School**, respectively.

The number of enrolled PhD candidates and of those who defended their PhD thesis between 2005 and 2012

Table 2

crt. no.	PhD coordinator	2005	2006	2007	2008	2009	2010	2011	2012	Total
1	Pop Grigor	0-1	0-0	0-5	0-0	0-1	0-0	0-1	0-0	0-8
2	Mac Ioan	1-4	5-1	1-2	2-5	0-3	1-2	0-1	0-1	10-19
3	Cocean Pompei	2-0	5-1	2-3	5-5	1-2	1-7	4-4	1-4	21-26
4	Surd Vasile	6-2	2-3	1-0	6-2	5-6	4-1	1-4	4-5	29-23
5	Sorocovschi Victor	3-0	1-3	0-5	3-2	2-0	1-4	0-3	0-0	10-17
6	Surdeanu Virgil	0-1	1-0	3-2	3-1	4-1	0-2	1-3	1-4	13-14
7	Ciangă Nicolae	3-0	4-0	5-0	6-4	4-1	3-3	6-2	4-3	35-13
8	Haidu Ionel	3-0	0-0	3-0	2-3	2-0	2-2	0-3	3-2	15-10
9	Benedek József	0-0	0-0	0-0	2-0	3-0	2-0	3-1	3-1	13-2
10	Irimuş Ioan A.	0-0	0-0	1-0	4-0	4-0	3-0	3-1	4-5	19-6
11	Petrea Dănuţ	0-0	0-0	0-0	4-0	0-0	2-0	2-1	4-2	12-3
12	Popescu Claudia	0-0	0-0	0-0	0-0	1-0	2-0	3-0	3-0	9-0
	Total	18-8	18-8	16-17	37-22	26-14	21-21	23-24	27-27	186-141

The first number in the columns represents the number of registered PhD candidates, while the second represents the number of those who defended their thesis in the mentioned years.

Without going further into details, the data in table 2, representing a synthesis of those indicated in table 1, highlight the fact that 186 PhD candidates were enrolled at the Geography Doctoral School of Cluj-Napoca during the assessed period of eight years. Of course, the numbers differed from one year to the other, as there were less than 20 in the first three years, then there were 37 people who enrolled for doctoral studies in 2008, and there were between 21 and 27 PhD candidates in the other four years.

Concerning the registration at the Doctoral School, one should stress that the numbers presented in table 2 are those corresponding for each PhD coordinator and each year of the analysed period. For example, one may notice the situation of *prof. Grigor Pop*,

whose last PhD candidate was enrolled in 2003 (reason for which this component is zero during the analysed period) and of prof. Claudia Popescu who became a PhD coordinator only since 2009 (and in her case, the defense is still zero). Assessing this component, taking into account the number of PhD candidates for every coordinator, it comes out that during the analysed period the highest number of candidates are coordinated by prof. Nicolae Ciangă (35 candidates), then prof. Vasile Surd (29), prof. Pompei Cocean (21), prof. Ioan-Aurel Irimuş (19), prof. Ionel Haidu (15) etc., while prof. Claudia Popescu (9 candidates enrolled in four years) is at the lower part of the classification (table 2 and fig. 1). This situation is the consequence of complex factors, of which the most decisive one is the period of activity of each coordinator.

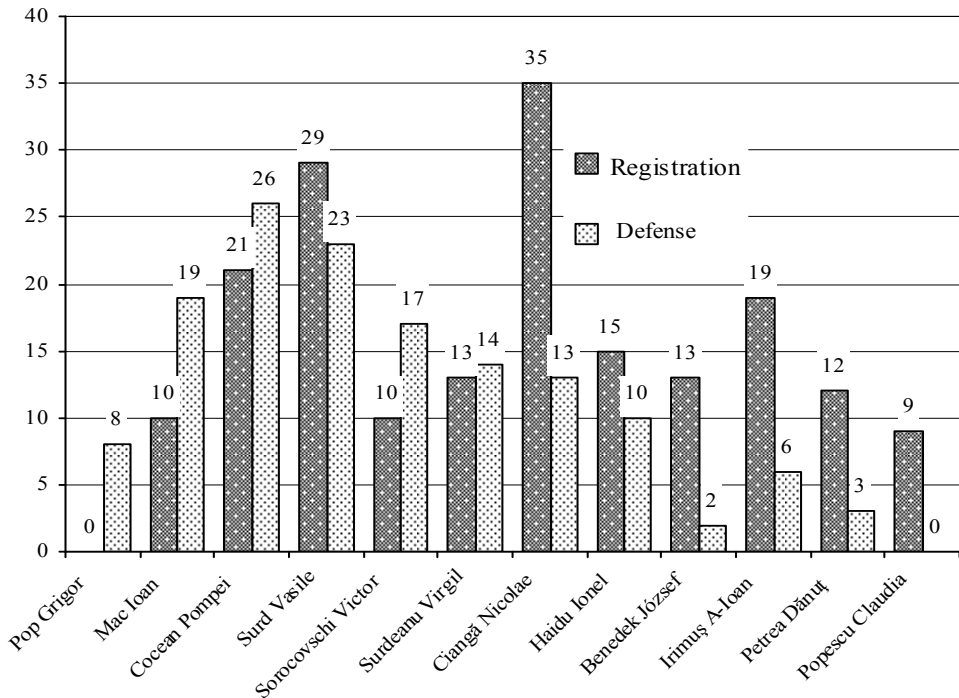


Fig. 1. The number of enrolled PhD candidates and the number of those who defended their thesis between 2005 and 2012.

2. 3. The defense of PhD theses

There was a total of 141 defended PhD theses, of which 71 belonged to candidates enrolled before 2005 and 70 to those who enrolled during the analysed period. The distribution by PhD coordinators is clearly indicated in table 1 and fig. 2. It should be underlined that, starting with 2013, a number of 136 theses remain to be defended. The situation for each PhD coordinator is the following: Pop Gr. 2, Mac I. 8, Cocean P. 9, Surd V. 18, Sorocovschi V. 6, Surdeanu V. 13, Ciangă N. 29, Haidu I. 9, Benedek J. 11, Irimuş A-I. 13, Petrea D. 9 and Popescu Claudia 9 (table 1).

Subject structure of PhD theses**Table 3**

Crt. no.	Subject structure	No.	%
1	Geomorphology	44	15.7
2	Tourism geography	43	15.3
3	Meteorology and hydrology	39	13.9
4	Environmental geography and geographical risks	39	13.9
5	Population and settlements	33	11.7
6	Regional geography	30	10.7
7	Territorial organization	23	8.2
8	Social geography	10	3.6
9	Agriculture and industry	5	1.8
10	Other subjects	15	5.3
	Total	281	100.0

of interest of professors V. Sorocovschi (25 theses), I. Haidu (21 theses, almost all based on GIS), Ioan Mac (9), I.A. Irimuş (9) etc. Then comes the *Geography of Population and Settlements*, including 33 theses, more than 50% of them coordinated by prof. V. Surd (17 theses) and *Regional Geography*, a field in which prof. P. Cocean coordinated 23 theses out of the total of 30, while other 5 were coordinated by prof. Benedek. Professors V. Surd (12 theses) and J. Benedek (4) coordinated 16 of the 23 theses in the field of Territorial Organisation etc.

2. 5. Territorial structure of PhD theses

Naturally, given the geographical position of Cluj-Napoca higher education centre and the size of the geographical-historical provinces where it lies, the highest number of theses, 170 (60.5% of the total of 281 PhD theses), covering all subjects, are related to Transylvania, followed by Maramureş (26 theses, 9.3%), Oltenia (11 theses, 3.9%) etc. Besides the 229 theses framed within the geographical-historical provinces of Romania, a number of 52 theses (18.5%) have a research subject positioned in two or more provinces or at the level of Romania and even in a foreign country, as it comes out from table 1.

We provide a few examples of the 281 theses in the above-mentioned order: *Brănişca-Păuliş Corridor. Human Geography Study* (coordinated by Gr. P. Pop), *Hazards, vulnerability and associated risks in Olt Valley, Racoş-Călimăneşti sector* (D. Petrea), *The tourism organisation of geographical space in the Northern Group of Eastern Carpathians* (V. Surd⁴); *The skiable potential of Romania* (P. Cocean), *Territorial disparities of the tourism supply in Romania* (J. Benedek); *The comparative analysis of environmental education in Germany and Romania* (I. Mac), *Complex rehabilitation of*

2. 4. The subject structure of PhD theses

As it comes out from the data presented in table 3, the 281 PhD theses of the 2005-2012 period belong to the following fields: *Geomorphology* (15.7%), coordinated by professors V. Surdeanu (22 theses), I. Mac (11), I. A. Irimuş (8) and D. Petrea (3), then almost the same frequency is recorded by *Tourism Geography* (15.3%), where most theses are coordinated by prof. N. Ciangă, 26 out of the total of 43 (table 3). The following fields, *Meteorology and Hydrology* and *Environmental Geography and geographical risks* has each 13.9%. They represent the fields

Territorial structure of PhD theses**Table 4**

Crt. no.	Geographical-historical provinces	No.	%
1	Transylvania	170	60,5
2	Banat	6	2,1
3	Crişana	4	1,4
4	Maramureş	26	9,3
5	Moldavia	6	2,1
6	Dobrudja	4	1,4
7	Muntenia	2	0,7
8	Oltenia	11	3,9
9	Other situations	52	18,5
	Total	281	100,0

⁴ The PhD coordinators are mentioned between brackets.

surface mining exploitation. Comparative study: Köflach – Austria, Lausitz-Germany, Aghireșu – Romania (N. Ciangă); The geomorphological determination for the urban development of Chișinău Municipality (V. Surdeanu), Quantitative methods of evaluation of the volcanic hazards in densely populated areas, with emphasis upon pyroclastic flows. Case study: El Misti and Arequipa city in South-West of Peru (I.A. Irimuș).

3. CONCLUSIONS

After the publication in the 8th decade of the 20th century of a number of papers regarding the situation of PhD studies in Romania, the period after 1990 led to the highlighting only of the activity developed in the Faculty of Geography located on the banks of Someșul Mic River. Those interested in this research direction are professors Grigor P. Pop and Nicolae Ciangă, as it clearly comes out from the references.

Taking this into account, we felt the need and at the same time the pleasure to update the issue of higher scientific research in the field of Geography at „Babeș-Bolyai” University by the means of this paper. Lately, due to the increase in number of PhD candidates, this situation became more and more complex and requests a certain need of restructuring.

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RECENT TRENDS IN RIVER MORPHODYNAMICS OF TURNU ROȘU – CĂLIMĂNEȘTI SECTOR*

ANCA AFLAT¹, IOANA CIOBAN¹, CLAUDIA CRISTEA¹, V. PETREA¹

ABSTRACT. – **Recent Trends in River Morphodynamics of Turnu Roșu – Călimănești Sector.** Turnu Roșu-Călimănești sector is characterised by a fluvial morphology influenced by numerous conditional factors: lithology, morphometrics and morphology, gradient, sediments, all these creating a transition from the current trends that become apparent in the study of the river morphodynamics. In order to achieve the intended purpose the following objectives were laid down: to improve the methodology of analysis and geomorphological investigation in line with current trends in the field, to highlight aspects of recent morphodynamics, as the study is based on GIS to capture the correlations between the current processes of bed scour and the effects of anthropogenic activities on inland waterway transport sector; to reveal the tendencies of development of riverbeds and slopes. The most obvious human intervention on the river system is the construction of dams (Turnu, Călimănești) and the fitting of artificial lakes (Robești). Olt River has witnessed important features of this type, with an evolutionary trend.

Keywords: *aging, the River Olt, trends, sector, natural units.*

1. INTRODUCTION

Historical studies on the dynamics of water courses have special attention, on the one hand to reconstruct the natural behaviour of the river, in which case the call to the historic information, cartographic materials, aerial photographs, and on the other, the conditions of the current evolution and on its anthropogenic footprint. The material presents a sectorial analysis of Olt River Valley by highlighting items which give it its individuality, by analysing the behaviour of the minor valley borders over time and an attempt to capture the trends on Olt Valley morphodynamics, in relation to anthropogenic influence in the area, principally through adjustments to the minor riverbed geometry, due in most situations to non-anthropogenic causes (dams, works to strengthen the banks etc).

* **Note: Invest in people!** Project co-funded by the European Social Fund by the Sectoral Operational Program Human Resources Development 2007-2013 priority Axis 1: "Education and Training in Support of Growth and Development of Knowledge-based Society" major Field of intervention: 1.5" Doctoral and Postdoctoral Programs in Support of the Research Project "Title:" doctoral Studies: Science to Society "Contract Code: POSDRU 6/1/S/3 Beneficiary: Babeș-Bolyai University.

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In order to highlight the evolutionary trends in Olt Valley gorge sector (Turnu Roșu-Călimănești sector), it is necessary first to consider the circumstances that determine the conditions of entry and maintain the old river bed processes: liquid and solid discharge entries, but also the slope conditions and the nature and extent of changes in the evolution of anthropogenic-induced characteristics, determining the changes generated by accumulating in the whites of threshold effects, induced the anthropogenic accumulation through dams, gravel pits etc.

2. AREAS OF RECENT FORMATION AND RIVER MORPHODYNAMICS

The gorge itself is a breakthrough of 58 km in the narrowest portion of the Southern Carpathians, guarded at the two ends by Boița and Călimănești settlements. Far from being uniform, there are clearly individualized sub-sectors, each corresponding to mountain landscape divisions, as follows:

2. 1. Turnu Roșu – Călimănești Sector – constitutes a physical-geographical well packaged in its links with the Lovișteea Basin and the mountains nearby. In the northern part of the gorge, the Boița-Câineni area individualizes a breakthrough of 17 km of Făgăraș and Lotru Mountains, then follows the basin down to the confluence with Lotru River, where Olt River enters the Cozia Gorge, extended over a distance of 16 km down to the area of Turnu.

2. 2. Turnu Roșu Gorge – the effective entrance in the Gorge is made in the commune of Boița, which gives a varied landscape, with meadows, the piedmont hills, as Boița village is at the contact area of the basin to the mountain. The slope of Boița reflects the contact between chrySTALLINE-Mesozoic and Neogene formations, evidenced by a steep scarp of 350 – 400 m. At the entrance of the gorge to the right of Greblesti, the slopes are between 15 °-35 ° tilt, which explains the presence of the embankment. The meadow is very limited in this region and in some instances the river digs its path directly through the slope, especially on the left side.

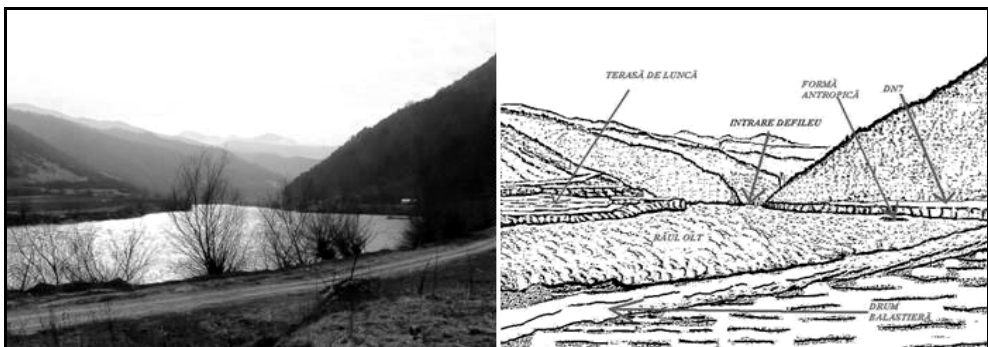


Fig. 1. Olt River at the entrance to Turnu Roșu Gorge, Boița (pictured on the ground, processed in GIMP2 outline).

2. 3. Lotru – Brezoi – Titești Chute – the sector between Căineni and Gura Lotrului, including the broadenings of Căineni, Balota, Racoviță and Călinești. The river has a skewness at Racoviță (left), where it widens to Copăceni, and from Călinești to Brezoi, the course has a strong meandering to the right, by Corbu, closing towards Golotreni. There Olt River receives one of the most important tributaries, Lotru River (Vărătica), following a significant narrowing. South of the River Greblesti to Brezoi, it has formed a wider opening allowing the location of built-up areas of localities. This is the area of Titești Brezoi Corridor – where the slopes range from 0° to 15° in the meadow and up to 20° - 30° on the hillsides.

2. 4. The Cozia Gorge – between Gura Lotrului and Călimănești, highlights a narrowing up to the localities Căineni – Cozia Călimănești – then, with the demise of the hillsides, one notices the presence of massive escarpments whose degree of inclination surpasses 35° . This is the range with the most active slope processes, generally, due to the gravitational gradient of the slope of the landscape. Descending towards Cozia and Căciulata, Olt River receives Căciulata tributary, changing over to the left, and forming a broad bend. One notices the presence of an improved island (Ostrov Convent). At the gorge exit (Călimănești), Olt River Valley widens considerably.

3. MEASURES FOR UPGRADING AND REGULARIZATION OF THE TERRITORY

The most important morphological modifications of Olt River system occur at the level of accumulation and erosion processes in the riverbed, the effects of meandering, unplaiting or conversely by deepening scour, both as a result of anthropogenic activities, as well as during high water or significant floods, as a result of large flow rates passing the bed in a relatively short time, but they occur at irregular intervals. Stronger flash floods for the analyzed sector were recorded at: Căineni – $Q_{max} = 2580 \text{ m}^3/\text{s}$, 1975-1800 m^3/s , 7-May 13, 1981-1380 m^3/s , 1941, 1950, 1970 and 2003). The average flow of Olt River under normal conditions does not exceed the $93 \text{ m}^3/\text{s}$.

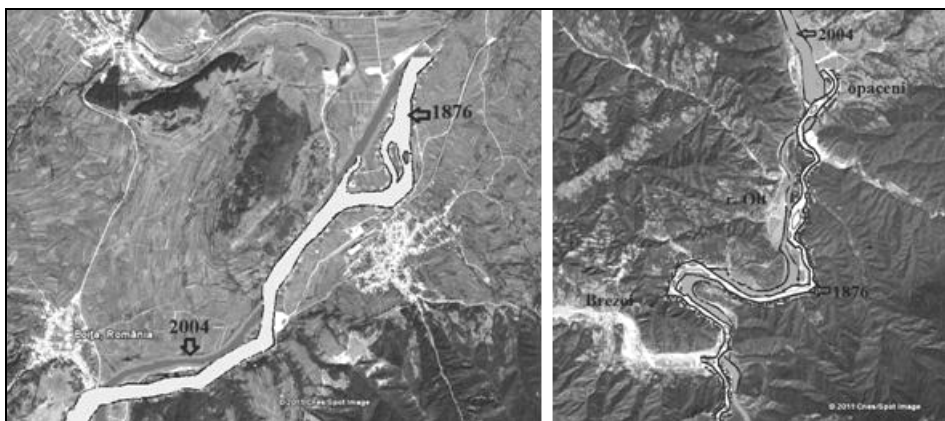


Fig. 2. The dynamics of the Olt River in Boița and Brezoi, having as reference the years 1876 and 2004.

Of the changes that occur as a result of the accumulation and fluvial erosion which meet and study within the framework of sector-level changes of islands and the number of meanders, changes of the original course of the river and the emergence of abandoned meanders (taking birth due to rectification of the channel, both naturally and artificially), the main question being posed by the migration of alluvial thresholds. As regarding modifications to the forms of accumulation (islands), following their evolution one notices a decrease in their number as a result of natural evolution, but mainly due to anthropogenic causes.

In the 1970s there was a total of 14 islands in the studied sector; at present their number has reduced to 6. Adjustments rates were made in Vadului – Căineni – Greblesti – Robești, Balota – Racoviță, Cozia – Călimănești. As regards the embankments, they are present in the major sectors along the river and are built with the ballast body of reinforced concrete plates: CHE Cornetu – left bank L = 4071m, right bank L = 4926m; CHE Gura Lotrului – left bank L = 1125m, right bank L = 5300m; CHE Turnu – left bank L = 343m, right bank L = 283m; CHE Călimănești – left bank L = 1369m, right bank L = 2136 m.

In the sector between Turnu Roșu and Cozia, the process of meandering is more underrepresented Olt River through a process of correction because of reservoirs and dams. An important element in the process of modelling by fluvial erosion is given by the geology of the substrate and the kind of dynamic characteristics of erosion in the meantime, in gorges their structure is more rough and the materials in the bed of the river are also littered with boulders, reducing transport capacity and a river-bed of aggradation. Thus, a crest conditioning is being carried out in such a threshold which distinguishes cross an area of alluvial and another to downstream erosion.



Fig. 3. Gravel excavation in the Olt River.

Human actions over Olt River flows consists of attenuation by building collections as those from Turnu Severin, Căineni, Robesti, Cornetu, Gura Lotrului or settlement and impoundments, Călimănești-Căciulata, borders, by the presence or possible collections associated with dams due to mining in local channels, or of the type of gravel pits.

We note the existence of two types of construction of water projects that have different implications in the fluvial dynamics of cross-sector with strikethrough, they interrupt the longitudinal connectivity in rivers resulting effects on the hydrological regime and the sedimentary transport; and strikethrough that interrupt the connectivity of the longitudinal sides of the water bodies with meadows as important fields known as important self-control spaces and at the same time stresses the increasing concentration in the currents, erosion, pushing material to the cross-sectional areas of strikethrough, however resulting in deterioration of general condition of the River. In most cases the influence of the dam on the flow stream would result in additional volume of water and sediment in suspension, thus changing the liquid and solid natural outflow.

5. CONCLUSIONS

The Turnu Rosu – Călimănești sector, seen as a morphologically distinct sector in the overall context of Olt Valley, individualizes its composition, the geology of the substrate, the geometry of the morphological, cover with vegetation and not least by anthropogenic component, all these variables in interrelations, carrying both the operation of the system, as well as recent trends in the river form morfodinamics. Adjustments to the shape of the analysed sector as a whole or to the level of detail are responses to the rhythms and sense of energy and mass leak inside the morphological system.

The longitudinal profile of Olt Valley highlights areas of narrowing (gorges) and areas of morfodinamics, the last stretch being materialized in the territory by a depression chute (the depresional passage Lotru – Brezoi – Loviște).

This scheme of narrowings and stretches, is the result of the evolution and dynamics of the Valley, through the natural processes of evolution over overlapping the intense antropical processes which they undergo this sector at present.

The most obvious human intervention on the river systems are the constructions of dams (Turnu, Călimănești) and fitting of artificial lakes (Robești). Olt River has experienced important developments of this kind, with an evolutionary trend.

Accumulation lakes, built with multiple purposes such as drinking water supply and industrial or energy purposes of protection against floods, causing as a hydromorphological pressure the interruption of the continuity of the flow and settlements of water flows. The main collections of accumulations in the study area can be found on Olt River, and part of the hydrographic network of its tributaries.

With regard to the anthropogenic arrangement of Olt River in Turnu Roșu – Cozia Gorge, references were hardly stroked from 1960 to 1968, when the complex development of the river has been developed by a number of organisations such as ICPGA, IPACA IPCH, etc. (Pop, 1996). In addition to the changes in the characteristics and course of the river, induced by the presence of accumulation, the river has gone through significant changes. Among them were the anthropogenic river bed aggradation processes, such as in the case of CHE Călimănești, construction of which they were required to work which consisted of approximately 6 m with lifting of the Calimanesti Hermitage island, in the case of the dam at Turnu, for which they were required to work the railroad segment with 20 m and DN7the highway that crosses the gorge at Cozia, or lifting and strengthening the remains of a roman Arutela, located in the bed of Olt River.

As a whole, the entire river system in the sector of interest, is influenced by fluctuations of flow and fluctuations of stream bed, which rapidly counterbalances between accumulation and erosion, in search of a state of dynamical equilibrium.

We believe that in these circumstances, the most important factor in defining the trends of the recent evolution of anthropogenic nature, and is mainly linked to the use of collections of water projects and the exploitation of material from the bed of the river.

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GEOLOGICAL AND GEOMORPHOLOGICAL FEATURES OF KENAI AND CHUGACH MOUNTAINS IN WHITTIER AREA, ALASKA

M.M. NISTOR¹

ABSTRACT. – **Geological and Geomorphological Features of Kenai and Chugach Mountains in Whittier Area, Alaska.** The study presents a petrographic and geomorphologic research in which we identified important aspects of the geological formation and described geomorphological features of Kenai and Chugach Mountains in the Whittier Area, Alaska State. The general objectives are a check-up and presentation of the nature of rocks and typical landforms of glacial models. The field research includes observations on landscapes, the peculiar forms and samples of rocks from various locations, in order to see the local or allochthonous character, knowing that the glaciers can transport materials for long distances. Every rock sample was cut and studied in section at the microscope. The glacial landforms and the types of glaciers existing in Whittier Area were analysed in the field.

Keywords: *geology, geomorphology, rocks, glaciers, Kenai, Chugach, Whittier, Alaska.*

1. INTRODUCTION

Whittier is a little town in the South of Alaska, situated in the NE of the Kenai Peninsula (fig. 1A), on the Pacific shore; it has the coordinates N 60°47', W 148°40'. The geographical territory presents obvious limits, because Whittier is at the head of the Passage Canal of Prince William Sound. The area is surrounded by the Kenai Mountains in the South and the Chugach Mountains in the North. The boundary between the Chugach and the Kenai Mountains is Portage Pass, West of Whittier. Both sectors of mountain chains record heights over 2000 meters and are covered by glaciers and ice-fields, and some glaciers slip into the ocean. The petrographical objective of research was a study of the types of rocks from Whittier Area and of the variety of landforms which have developed on the existing geology, considering that the morphological features are changed by glaciers. Also, the petrographic observations illustrate the geologic formations from the Alpine orogen, Alaska. The observations in the field have a geomorphological nature in the proximity of glaciers action zone. The methods used in this research are at macroscale – in field where sample rocks were taken – and at microscale – the manufacture of the thin sections for the microscope study in polarized light of the mineral characteristics.

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2. GEOLOGICAL SETTING

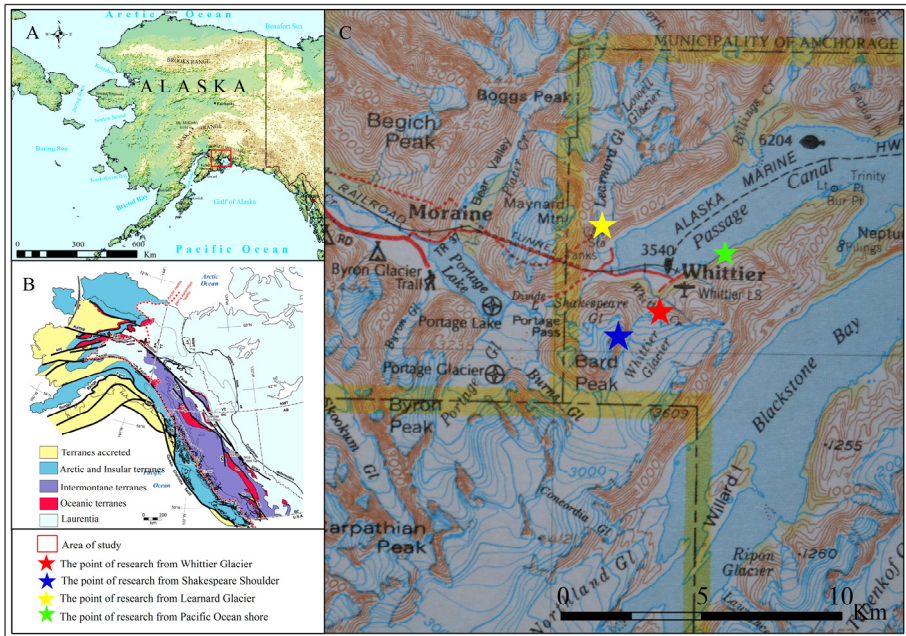


Fig. 1. A. The localization of study area on Alaska physical map. B. Geological map of Alaska. C. Localization of petrographic interesting points. Source: Alaska – Atlas & Gazetteer with changes.

From a geological point of view, the area is situated on the tectonic compression active line, where the Pacific plate is diving under the American continental margin. The land surfaces in Alaska are continually compressed and folded, which pushes up McKinley Mountain, as well as the rest of the mountains in the Alaska Range. These processes influence the geology of the area and result into various types of associations in the same place: Terranes accreted, Arctic and insular terranes, Intermontane terranes, Oceanic terranes, Ancestral North America (fig. 1B).

The samples of rock examined were taken from the front of the Whittier Glacier, the front of the Learnard Glaciers and Shakespeare Shoulder – 1071 m (fig. 1C).

The Whittier Glacier is located near Whittier town, about 2 miles South of Passage Canal and 50 miles ESE of Anchorage. The height where we made the research was between 600 m and 800 m along the ice-blocks of the glacier (fig. 2).

The majority of the rocks existing in the proximity of the Whittier Glacier are slates, sandstones and graywackes of Cretaceous age. The sedimentary rocks and terrestrial clastic brought by glacial torrents belong to the Pliocene. The graywackes are highly indurated rocks, whose most conspicuous feature to the unaided eye is the unusual abundance of small angular slate fragments. They are of dark bluish-gray color and at some places are not easily distinguishable from basic volcanics. Under the microscope the graywackes prove to be of rather heterogeneous derivation. There are angular fragments of quartz, containing fragments of feldspar and plagioclase in part.

A little muscovite, epidote, pyrite, magnetite, and zircon are present as accessories. The binding material is a feebly polarizing aggregate flecked with chlorite. In one of the thin sections of the graywackes the vein shows with filling of quartz and edged with the scalenoidri of calcite (fig. 3).



Fig. 2. The field localization of Shakespeare Shoulder and Whittier and Shakespeare Glaciers.

The deposits of moraines situated in front of Learnard Glaciers contain sedimentary rock and metamorphic rocks. These materials originate in the Chugach Mountains (fig. 5). The chain has a general northwesterly trend from Mount St. Elias, and constitute the high barrier between the Pacific coastal belt and the interior. The general petrography of the rocks of the deposit material proves the epimetamorphic schists and the the blocks of sandstones with layers of calcite. The microscopic study indicates that the cleavage of schist assume a schistose foliation, which has become glossy and passed into phyllitic schist. In thin section it shows that the schist is composed of fragments of quartz and sericite.

The rocks found on Shakespeare Shoulder have a magmatic origin and belong to the Kenai Mountains. The graywacke and slates are intruded by quartz diorite or diorite dikes and are probably of Cretaceous age. Under the microscope, the section represents a porphyric monzodiorite (fig. 4). The microscope shows that the rock is largely composed of opaque angular fragments of a greenish-yellow color. Detailed description of the section have a porphyric structure with micrograian basic mass. The composition included dark minerals: quartz-diorite gneiss, plagioclase feldspar, feldspar ortoclaz, sericite, chlorite, calcite. Here such fragments contain phenocrysts of highly altered feldspar.

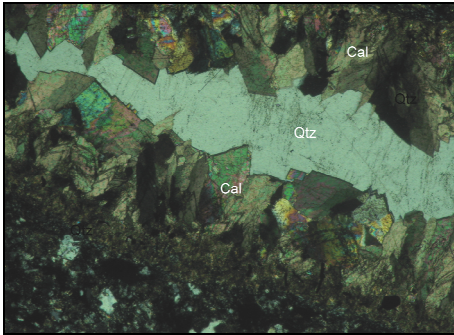


Fig. 3. The microscopical image of graywacke with calcite vein (N+), Qtz-quartz, Cal-calcite.

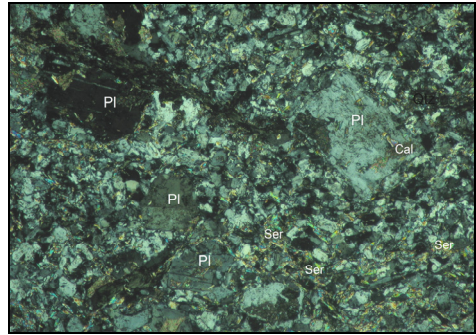


Fig. 4. The microscopical image of monzodiorite porphyric (N+), Pl-plagioclase, Cal-calcite, Ser-sericite.

The shore contains unconsolidated Quaternary deposits of glacial moraine and stream gravel. In the East of the Whittier, the shore is constituted by clay-schist and massive limestone. The metamorphic rocks have a pronounced cleavage generally perpendicular to the bedding.

3. GEOMORPHOLOGICAL SETTING

The morphological features of the Whittier area are the result of the complex geomorphological evolution in Wisconsin glacial period and are at the same time closely connected with the tectonic history of the region, continued with Holocene glacialism in present day. The glaciers are the principal agent for the modelling of relief, therefore the preeminent landforms have glacial origin. In the case of the Whittier area, there are zones of erosion, accumulation and transport by Whittier, Learnard and Billings Glaciers where there are typical features of glacial action. The climatic conditions add to these landforms, especially in summer, when the temperature is not constant, and exogenous processes affect the rocks. Slope landforms and processes can be formed by gravity, running water or cryoturbation. Stream landforms and processes are specific only in summer. The most typical features will be described below with examples from fieldwork in the Whittier area.

4. TYPES OF GLACIERS FROM PASSAGE CANAL

In the surroundings of Prince William Sound, there are a lot of glaciers concentrated around the bigger glaciers and icefields. The Columbia Glacier spreads in the northern part of sound. It is known as the largest tidewater glacier in North America. This glacier has 42 miles length and 4 miles wide at terminus and has many branches in all directions. In the eastern part of Prince William Sound, there is another big glacier, Bering Glacier, which has its origin in Bagley Icefield. In the opposite part, in the West, there are Sargent and Harding Icefields, which feed the glaciers from Kenai Peninsula.



Fig. 5. Chugach Mountains and Learnard Glacier.

In the Passage Canal there are two main types of glaciers: hanging glaciers and valley glaciers. The hanging glaciers are clung on inclination slopes, near the peaks in snow accumulation zones. This type of glacier forms if a valley or cirque glacier ends abruptly at the top of a cliff. Two good examples include Shakespeare and Lowell glaciers located in Passage Canal. After the Wisconsin Ice Age, many bigger glaciers have melted and now they are little hanging glaciers.

The valley glaciers fill the space between ridges and transfluence saddle. This type of glacier is very common throughout Alaska. In the Passage Canal, there are Billings and Learnard Glaciers that flow into the Pacific Ocean.

The icefields represent a large mass of ice where many valley glaciers flow out on all sides. A representative icefield from Whittier area is Blackstone Icefield situated in northern Kenai Peninsula and feeds Whittier Glacier, Northland Glacier, Concordia Glacier, Burns Glacier, Portage Glacier, Spencer Glacier and many other glaciers of which some reach the Passage Canal, others the Blackstone Bay or the North-West and South part of the peninsula.

Another type of glacier that exists in Passage Canal is the cirque glacier. Cirque glaciers are formed near mountain ridges, in circular basins or amphitheaters, but they are relatively small.

5. GLACIAL LANDFORMS

The landscape is the result of climate and of latitude as well. These factors were both an advantage for the development of glaciers on the valleys. Only the high peaks are not affected by ice mass in Whittier area. The glacial cirques from the South-East of the Whittier have big circular basins and are situated at low height. The walls of these cirques are vertical and are furrowed by waterfalls. The slopes of the cirque are relatively small, but the amphitheater form is still kept. The glacial valleys, after the melting of glaciers, are modelled by creeks. Along the valleys with steep slopes there are many waterfalls, which have the nourishment from glaciers. The cross sections of young valleys show a beautiful glacial U-shape (fig. 6) which later will be influenced by gravitational phenomena and running water erosion.



Fig. 6. Glacial valley from Kenai Mountains.



Fig. 7. Hanging glacial lakes.

The glacial erosion processes created edges of overdeepened hollows, erosional scarps, cirque edges, transfluence saddle, steps of hanging troughs and smoothed surfaces. On the high platform, there are remains of hanging valleys and glacial lakes. In the vicinity of the Whittier Glacier front, on the sliding bed of ice mass there are rocks moutonnée.

The complex material of rocks resulted from glacier transport represents the constructional landforms and deposits. In Whittier area, there are superglacial moraines, moraine ridges, moraine deposits and erratic boulders which are very visible at the Learnard Glacier (fig. 8). The moraines take particular festooned forms, often arranged in sequential rows. When a glacier is still, which means it neither advances nor recedes, transported rock and debris that is always left behind at its terminus accumulates there. The result is a new landform: the terminal moraine.

6. PERIGLACIAL LANDFORMS

The cryoclastism is a physical process which changes the geomorphological modelling in Whittier area. Cryogenic and nivation landforms are included in erosion landforms – avalanche tracks – and accumulation landforms and deposits – protalus ramparts, block streams, block fields. Gelifluction phenomena give also rise to evident morphological features especially on slopes near the Shakespeare Shoulder and Portage Pass. Processes connected with ice and snow hasten the rock flows. As an example, there are rock glaciers which represent an interesting landform developed on the high and steep slopes.

7. GRAVITATIONAL LANDFORMS

Landforms and deposits due to gravity in Whittier area represent the effects of retreating glaciers. The best example are the blocks of rocks present in the valley created by Learnard Glacier. While glaciers withdrew, the pressure of walls diminishes and scree slopes, landslides and talus heaps are born. The results of wall erosion are scarp edges and rock defile with occasional debris falls. The landforms such as talus cones are accumulations of avalanche tracks and are frequently at base of walls and glacial cirque floors.



Fig. 8. Moraine deposits from Learnard Glacier.



Fig. 9. Coalescing delta West of Passage Canal.

8. ACCUMULATION LANDFORMS AND DEPOSITS DUE TO RUNNING WATER

After the retreat of the glaciers, by the ocean, the torrents dropped the sediments and constructed deltas at the margins of fjords. In Whittier area, there are three lowlands which represent unconsolidated Quaternary deposits, consisting of glacial moraine, coarse sands, reworked outwash and stream gravel. The large sheet of glacial gravels is the most recent deposit of the region - a result of prevalent fluvial processes.

Whittier is built on a fan-shaped delta formed by extensive deposits of fluvioglacial gravels. This material is a result of the Whittier Creek contribution – a creek fed by Whittier Glacier. In the western part of the Passage Canal, there is a lowland area which consists of coalescing deltas of creeks flowing from Portage Pass, Shakespeare Glacier and Learnard Glacier. Another large delta was formed by Billings Creek on the north side of the Passage Canal.

9. ANTHROPOGENIC LANDFORMS AND DEPOSITS

The heavily shaped area includes human establishments and neighbourhood of harbours. Few of these are found in Whittier area and are situated on the shore. The artificial landforms were born in the same time with the improvement of territory. On the dry land, artificial debris are used for building the parking lots, the track for planes and roads. For railway improvement, it was necessary to modify the slope and the result was vertical walls and edge of excavation. On the wetland, people built embankments and near the shore they stabilized the cliff with blocks of rocks.

The human factor influenced the landscape modifying the topographic aspects. Thus, construction of buildings and streets imply equalization of ground and creation of embankments, improvement of tunnels, while plumbing and sewerage networks involve diggings and storage of materials.

10. CONCLUSIONS

The geology of Whittier belongs to Kenai and Chugach orogen and it contains those three groups of rocks because of intricacy of forming conditions. In Whittier area the sedimentary rocks are represented by graywakes and sandstones. The magmatic rocks associated with subduction zones are present in the continental arc type structures

through monzodiorite. The metamorphic rocks originate in the continental lithosphere affected by cutting during accretion prism formation. The sample rocks analyzed present local and allochthonous character, due to the fact that two rocks taken from the same place have affiliation to different groups.

All landforms of the Whittier area are the result of endogenous and exogenous processes, molded by ice which eventually created the famous fjord system included in the Prince William Sound.

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THE LAW OF THE ORDER OF WATERSHEDS

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ABSTRACT. – **The Law of the Order of Watersheds.** In fluvial geomorphology studies that aim at deciphering the evolution of landforms, apart from the identification of the order of streams, it is also very useful to know the order of the watersheds. The main purpose of this paper is to formulate the law of the order of watersheds. It also checks if the stream order and the nearby watershed order have the same value. In order to highlight this, a methodology has been established in order to formulate the above-mentioned law. As a starting point, we used the order of the streams law, in Horton-Strahler system, in the form used by Zăvoianu in 1978. An analogy between them was established, in the sense that the node rate or the watershed intersection rate was used instead of the confluence rate, because watersheds do not form a confluence, but gather into orographic nodes. In order to verify this law, 12 watershed models have been selected from the autochthonous drainage systems, representative for the Transylvanian Basin. The acquired results demonstrate on one hand that the law is valid, and on the other hand that it is not necessary that streams and bordering watersheds have the same order. This fact is possible because the difference between the order of a major watershed and of the bordering main streams also presents variations. In most of the cases, the order of the watershed is higher than the one of the neighbouring streams. The difference recorded in these cases increases as the number of lower order streams do not form confluences, in order to increase the drainage system order, but they flow directly into an upper order mainstem, whose order cannot be increased.

Keywords: *watershed, node rate, order, drainage network.*

1. OBJECTIVES

As a result of the fluvial evolution of different territories, a complementarity between drainage network and watersheds may occur. In the case of the drainage network, a series of laws regarding their order have been conceived and demonstrated. The bifurcation ratio was also described, and was later redefined and named as the confluence ratio (Horton, 1945, Zăvoianu, 1978). In these circumstances, one may consider the formulation and validation of the law of the order of watersheds, based on the node ratio or watershed intersection ratio (because they do not form confluences, but gather in orographic nodes). The analysis of the order of watersheds and streams, which is based on a similar methodology, allows the opportunity to verify the existence (or not) of the same order for the neighbouring streams and watersheds.

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2. METHODOLOGY

In formulating the methodology regarding the order of the watersheds, we started from the order of the streams law in Horton-Strahler system, initially created by Horton (1945), and later modified by Zăvoianu (1978).

The data series value representation, referring to the order of the stream segments, in semilogarithmic coordinates, allowed Horton (1945, p. 291) to formulate the law, which stipulates that: „*the number of different order rivers in a given basin converges towards an inverted geometric progression, in which the first term is the unit, and the ratio is the bifurcation ratio*”.

$$R_b = \frac{N_u}{N_u + 1}$$

where: R_b – the bifurcation ratio; u – the order of the segment; N_u – the number of segments belonging to a certain order.

As a result of the analyses made on the drainage network of different basins, but mostly in Ialomița basin, and in order to use the confluence ratio instead of the bifurcation ratio (a stream of a certain order is formed after the confluence of two streams and not after their bifurcation), I. Zăvoianu (1978, p. 40) proposed the removal of the idiom “*the first term is the unit*” from Horton’s law, which led to the reformulation of the law of the number of streams as following: “*the number of river segments belonging to consecutive orders in a given basin converges towards an inverted geometric progression, in which the first term (N_1) is given by the number of first order streams, while the ratio is the confluence ratio (R_c)*”.

The confluence ratio is computed as follows:

$$R_c = \frac{N_x}{N_x + 1}$$

where: R_c – the confluence ratio; N_x – the number of segments of x order.

The difference between the two laws is that „the first term” is not the unit, as in Horton’s law, but the number of the first order streams (Ichim, Bătucă, Rădoane, Duma, 1989).

The watersheds number law. As a result of the representation of data series values, referring to the order of the stream segments, in semilogarithmic coordinates, infers the law stating that: “*the number of watersheds segments belonging to consecutive orders, between two streams, converges towards an inverted geometric progression, in which the first term (N_1) is given by the number of first order watersheds, while the ratio is the node ratio or watershed junction ratio (R_j)*”. In the case of this law, there is a similitude with the first above-mentioned law, where it is stipulated that the confluence of two first order streams form a second order stream.

Certain similarities can be noticed between the law, which stipulates that the confluence of two first order streams form a second order stream, and the proposed law. In this case, if two first order watersheds junction or unite, they form a second order watershed, if two second order watersheds junction, they form a third order watersheds, and so on and so forth; when two different order watersheds meet, the superior order of the watershed is kept.

The node ratio is computed as follows:

$$R_j = \frac{N_x}{N_x + 1}$$

where: R_n - the node ratio; N_x - the number of segments of x order.

One may determine the node ratio for every pair of segments:

$$R_{j_1} = \frac{N_1}{N_2}; \quad R_{j_2} = \frac{N_2}{N_3}; \quad R_{j_n} = \frac{N_n}{N_{n+1}}$$

where: R_{j_1} - the node ratio between the first and second order segments; N_1 - the number of first order segments; N_2 - the number of the second order segments.

In this case, the node ratio represents the arithmetic mean of individual ratios:

$$R_j = \frac{R_{j_1} + R_{j_2} + R_{j_n}}{n}, \quad n - \text{the order of the watershed.}$$

The knowledge of the number of first and second order segments and of the node ratio provides the opportunity to compute the number of watersheds belonging to any x order, which represents nothing else than the ratio between the number of watersheds belonging to an immediately lower order and the node ratio (R_j).

$$N_x = \frac{N_x - 1}{R_j}$$

where: N_x - the number of segments belonging to x order; N_{x-1} - the number of watersheds belonging to an immediately lower order.

The total number of watershed segments (N) belonging to any (x) order is computed with the ratio:

$$N = \frac{N_\Omega (1 - R_j^\Omega)}{1 - R_j}$$

where: N - the total number of segments; N_Ω - the order of the main watershed.

3. RESULTS

In order to check the proposed method, twelve watershed models were chosen, located in autochthonous drainage basins, in the Transylvanian Depression. The drainage basins to which we refer to, are drained by rivers with the second, third, fourth and fifth order in the Horton-Strahler's system. According to their order, the chosen watersheds can be classified in: two of the fifth order, eight of the fourth order and two of the third order.

As a result of the establishment of the number of segments, belonging to the twelve watersheds, and of their representation in semilogarithmic coordinates, the corresponding regression lines were obtained (Fig. 1 and 2). Their analysis indicates that the number of segments belonging to consecutive orders form a geometric progression, in which the first term (N_1) is given by the number of first order watersheds, while the ratio is the node ratio (R_j).

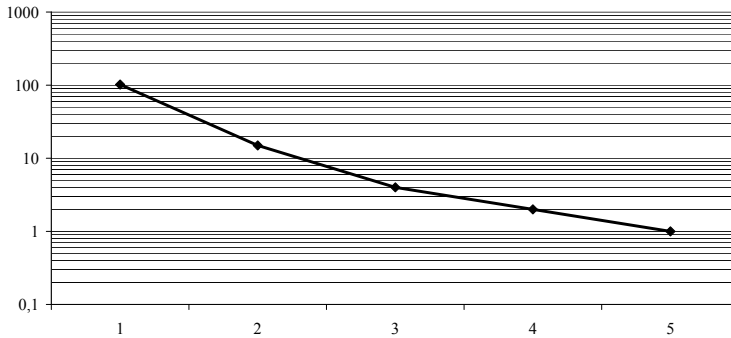


Fig. 1. The law of the order of the watersheds for Popcești – Valea Mare watershed.

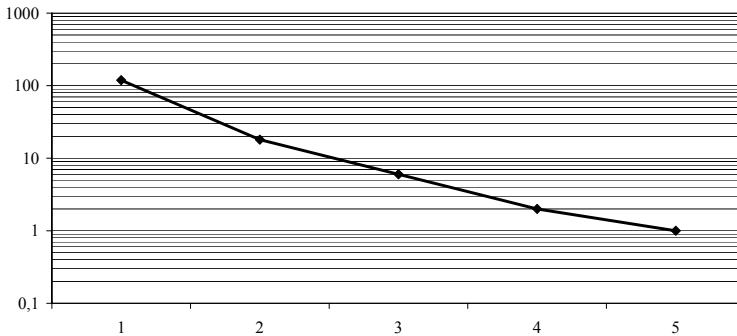


Fig. 2. The law of the order of the watersheds for Calva – Slămnice watershed.

Because of the territorial differences, another suitable indicator that can be analysed is the **node ratio** (fig. 3). In this case there is a higher frequency of the values between 3.5 and 4.99 (table 1) recorded for the watersheds of the basins of Nadăș (3.63), Visa (3.65), Comlod (4.08), Cincu (4.33), Valea Lungă (4.49 in the basin of Târnava Mare), Almaș (4.83) and Coveș (4.96 in Hârtibaciu basin), followed by the values between 5.00 and 8.00 specific for Zăvoi (5.20 in Hârtibaciu basin), Luduș (5.25) and Fizeș (5.56).

Values over 8.00 are specific to the watersheds of Secașul Mic (8.15) and Poiana (8.3 in Someș basin). The higher values in that basins show an intensive dynamics of the geomorphological processes, based on the fragmentation of the relief, as compared to the present situation in the basins with the values of R_j under 5 (table 2). The variation of R_j between 3.63 and 8.30 reveals the presence of orographic disparities among different units of the Transylvanian Depression.

The interpretation of the values for the twelve watersheds models, allows to underline the main final results according to the existing differences between the order of watersheds and the bordering streams.

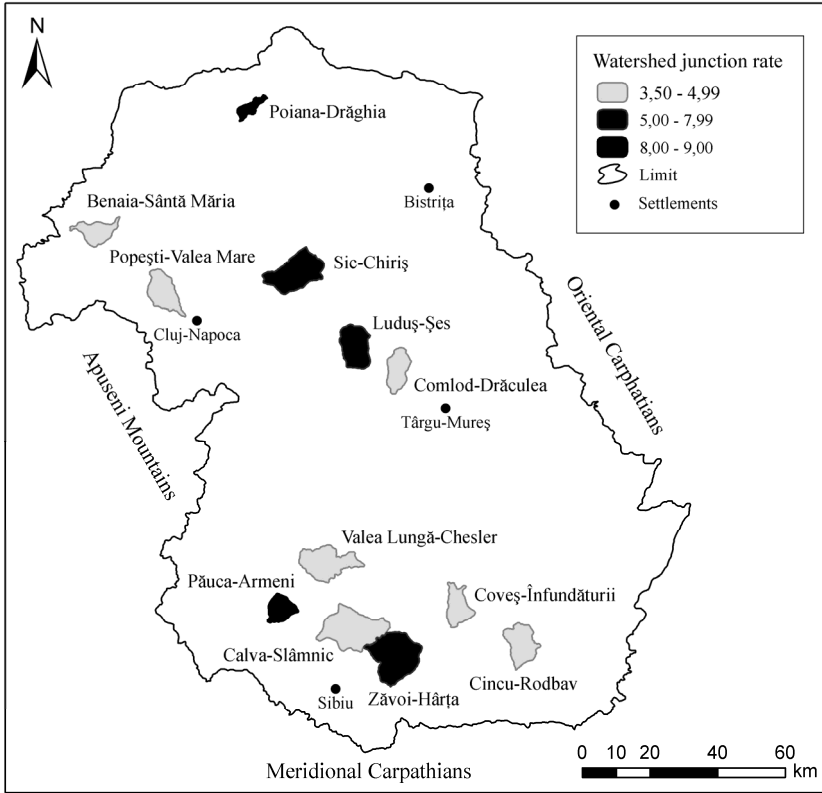


Fig. 3. Territorial differences of the node ratio in the Transylvanian Depression.

The basis of this analysis is given by the knowledge of the order of watersheds located between two streams whose order is also known. After a short synthesis of each case, one can establish the degree of similarity between the order of the streams and watersheds.

The watershed between Poiana and Drăghia (Someș basin) of the third order is located between a fifth order stream (Poiana) and a fourth order stream (Drăghia).

The watershed between Benaia and Sântă Măria (Almaș basin) is of the fourth order and is bordered by two third order streams.

The watershed between Popești and Valea Mare (Nadăș basin) is of the fifth order and is situated between two fourth order streams.

The watershed between Sic and Chiriș (Fizeș basin), of the fourth order, is bordered by a fifth order river (Sic) and a fourth order river (Chiriș).

The watershed between Luduș and Șes (Luduș basin) is of the fourth order and is located between a fifth order stream (Luduș) and a fourth order stream (Șes).

The watershed between Comlod and Drăculea (Comlod basin) is of the fourth order and is bordered by a fifth order stream (Comlod) and a fourth order stream (Drăculea).

The order and the number of segments of the watershed**Table 1**

Watershed	Order	Area Km ²	The number of segments					
			Measured Calculated	N ₁	N ₂	N ₃	N ₄	N ₅
Calva-Slâmnic	5	131.85	m	119	18	6	2	1
			c	65.3	17.9	4.9	1.6	0.5
Popești-V. Mare	5	84.58	m	102	15	4	2	1
			c	54.0	14.8	4.1	1.1	0.5
Zăvoi-Hârța	4	166.45	m	122	16	4	1	
			c	81.1	15.6	3.0	0.7	
Sic-Chiriș	4	137.55	m	136	16	5	1	
			c	86.5	15.5	2.8	0.8	
Luduș-Șes	4	96.28	m	115	19	7	1	
			c	99.2	18.9	3.6	1.3	
V. Lungă-Chesler	4	71.52	m	80	13	3	1	
			c	56.4	12.5	2.8	0.6	
Comlod-Drăculea	4	66.84	m	63	12	3	1	
			c	48.2	11.8	2.9	0.7	
Coveș-Înfundăturii	4	66.69	m	95	12	3	1	
			c	59.0	11.9	2.4	0.6	
Benaia-Sântă Măria	4	60.04	m	57	6	2	1	
			c	27.9	5.7	1.2	0.4	
Cincu-Rodbav	4	43.39	m	36	4	2	1	
			c	16.8	3.8	0.9	0.4	
Păuca-Armeni	3	51.96	m	40	3	1		
			c	20.4	2.9	0.3		
Poiana-Drăghia	3	25.70	m	41	3	1		
			c	24.8	2.9	0.3		

The watershed between Valea Lungă and Chesler (Târnava Mare basin) is of the fourth order and is located between a fourth order stream (Chesler) and a third order stream (Valea Lungă).

The watershed between Păuca and Armeni (Secaș basin) is of the third order and is located between a third order stream (Păuca) and a second order stream (Armeni).

The watershed between Calva and Slâmnic (Visa basin) is of the fifth order, but is situated between two fourth order streams.

The watershed between Zăvoi and Hârța (Hârtibaciu basin) is of the fourth order, and is located between a fourth order stream (Zăvoi) and a third order stream (Hârța).

The watershed between Înfundăturii and Coveș (Hârtibaciu basin), of the fourth order, is positioned between two third order streams.

The watershed between Cincu and Rodbav (Olt basin), of the fourth order, is located between two fourth order streams.

The node ratio

Table 2

Watershed	Order	Area Km ²	The node ratio (R _j)				
			N ₁ /N ₂	N ₂ /N ₃	N ₃ /N ₄	N ₄ /N ₅	Average R _j
Calva-Slămnice	5	131.85	6.61	3.00	3.00	2	3.65
Popești-V. Mare	5	84.58	6.8	3.75	2	2	3.63
Zăvoi-Hârța	4	166.45	7.62	4	4		5.20
Sic - Chiriș	4	137.55	8.5	3.2	5		5.56
Luduș - Șes	4	96.28	6.05	2.7	7		5.25
V. Lungă-Chesler	4	71.52	6.15	4.33	3		4.49
Comlod-Drăculea	4	66.84	5.25	4	3		4.08
Coveș-Înfundăturii	4	66.69	7.9	4	3		4.96
Benaia-Sântă Măria	4	60.04	9.5	3	2		4.83
Cincu-Rodbav	4	43.39	9	2	2		4.33
Păuca-Armeni	3	51.96	13.3	3			8.15
Poiana-Drăghia	3	25.70	13.6	3			8.30

The presence of all these differences shows that giving the same order to the watersheds, as to the bordering streams, is only uninspired and unrealistic. Of the 12 examples, there is one case (*Cincu - Rodbav watershed*) where the order of the watershed and that of the streams bordering it are the same. As for the others, the following situations are given: in one case (*Poiana - Drăghia watershed*) the order of the watershed is lower than the order of the bordering streams; in four cases (*Benaia - Sântă Măria, Popești - Valea Mare, Calva - Slămnice, Coveș - Înfundăturii watersheds*) the order of the watershed is higher than the order of the bordering streams; in the other six cases, the value of the order of watershed is identical with the value of one of the bordering streams.

The high percentage (50%) of the cases, when the value of the order of the watershed is the same with the value for one of the bordering streams, sustains and confirms the argument which stated that it is not too good to ascribe the watershed the value of the order of one of the streams bordering it, not to mention that sometimes, none of the rivers are of the same order as the watershed.

The watersheds located between two streams of the same order, which receive the same value of the order, like the two streams, is finally a normal situation, as in the case of the watershed between Cincu and Rodbav (fig. 4). The same circumstances are specific for the watersheds located between two different order streams, but which are given the same order as one of the streams (fig. 5).

Differences may appear when the order of the watershed is not identical with any of the main streams bordering it, and in this sense, two such situations have been distinguished.

The first of them is characteristic for the watersheds that have a lower value of the order than the streams bordering them. Among the examples provided, there is only one such situation, in the case of the third order watershed between Poiana and Drăghia, located between a fifth order stream (Poiana) and a fourth order stream (Drăghia) (fig. 6).

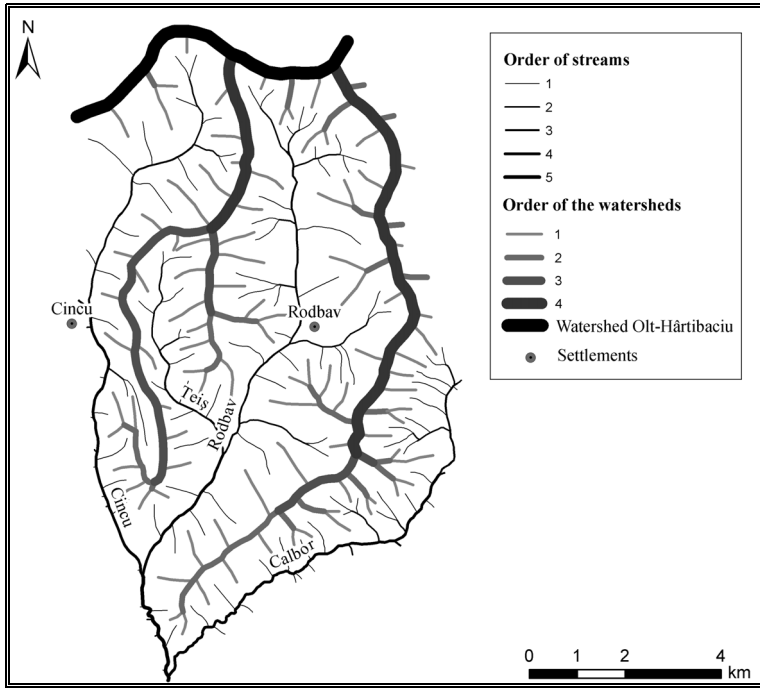


Fig. 4. The order of the watersheds between Cincu and Rodbav valleys.

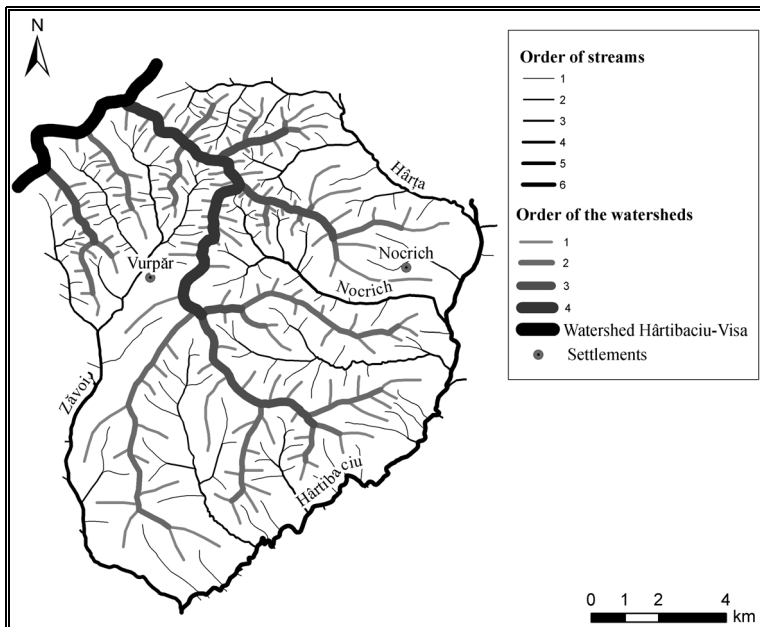


Fig. 5. The order of the watersheds between Zăvoi and Hârța.

The existence of a lower value of the order of the watershed as compared to the bordering streams is explained by the independence between the drainage network and that watershed. In these conditions, the drainage network increased its order because of the river segments coming from the "surface" of the watershed, on one side of the watershed, but especially, due to segments, to the tributaries coming from the other side of the watershed.

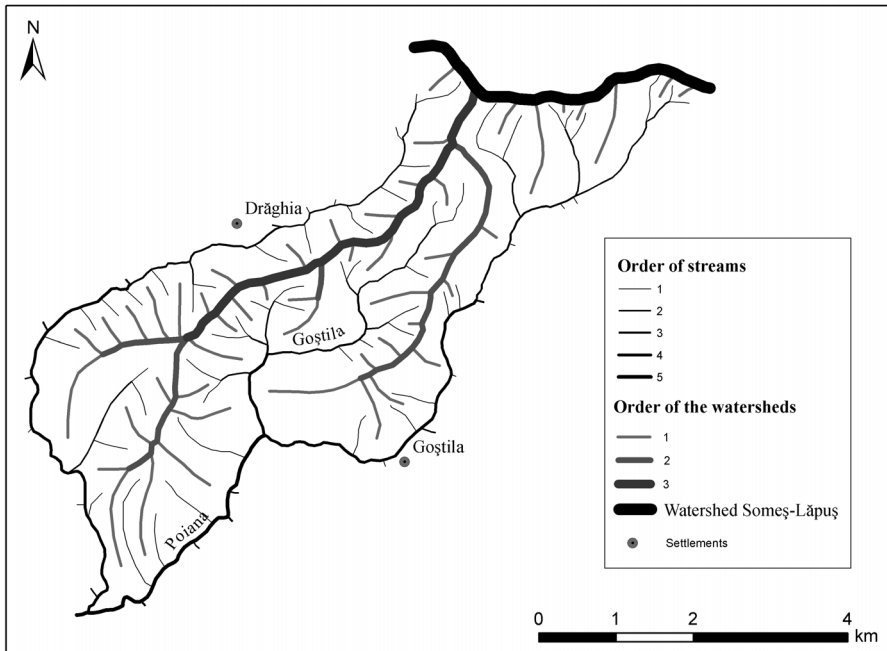


Fig. 6. The order of the watersheds between Poiana and Drăghia valleys.

The second situation is specific for watersheds that have a higher value of the order, than that of the streams bordering them. In the examples provided, four of them have these characteristics: Benaia and Sântă Măria watershed, Popești and Valea Mare watershed, Calva and Slămnice watershed and Înfundăturii and Coveș watershed. The presence of the watersheds that have a higher value of the order than the main streams bordering them, is this time explained by the independent evolution of the slopes, and in connection, of the watersheds, as compared to the rivers below. The difference is made by the first order stream segments which, dividing the watershed, instead of being collected by the two rivers bordering it and thus increasing their order, are directly collected by the main stream, without increasing its order. For example, in the case of Înfundăturii-Coveș watershed (of the fourth order) , one may notice that a series of first, second and third order tributaries flow into Hârtibaciu between the confluence of Înfundăturii river and that of Coveș river with Hârtibaciu (fig.7). However, their upper streams do not reach the major watershed between

Târnava Mare and Hârtibaciu. Because they flow directly in Hârtibaciu, the mentioned tributaries determine the increase in order of the watershed, but not an increase in order of Înfundăturii (of the third order) and Coveș (of the third order) rivers, for them to have the same order as the watershed between them. Only in these conditions one may speak of an independent evolution between the watershed and slopes, on one hand, and the streams that bordered it initially, on the other hand. An important role in the increase of the gap between the order of the watersheds and that of the streams bordering them initially is also played by the evolution of slopes by refragmentation, due to the lower order drainage systems.

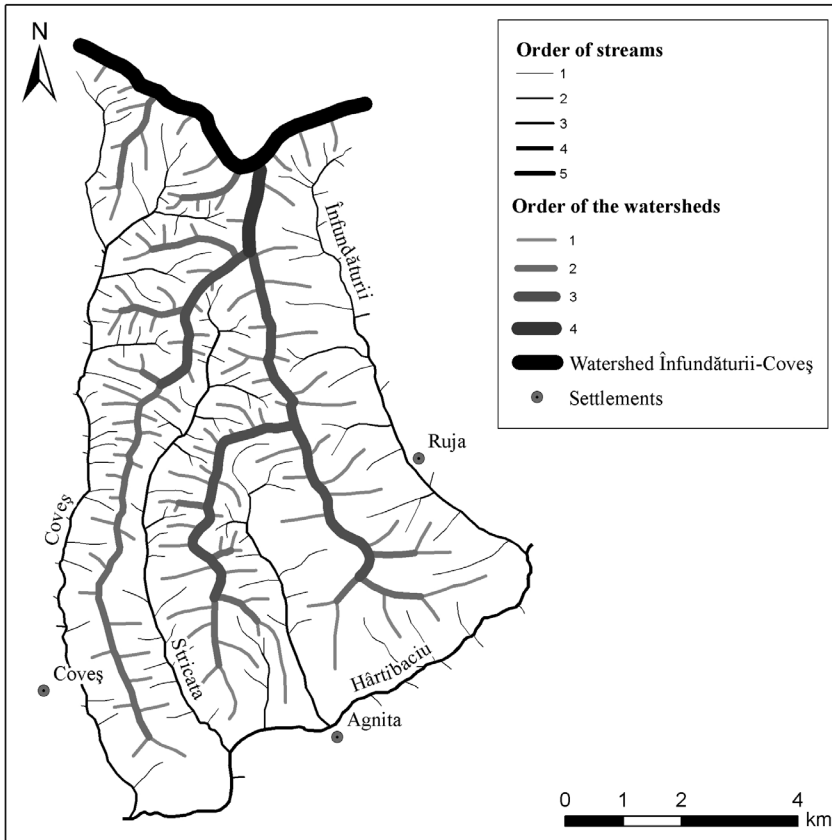


Fig. 7. The order of the watersheds between Înfundăturii and Coveș valleys.

Considering the differences recorded in the examples above, a law may be stated, that *the difference between the order of a major watershed and that of the main rivers bordering it increases together with the number of lower order segments that divide it, without meeting any of the mentioned main rivers, thus increasing the order of the drainage network, but flowing directly into their main stream, without increasing its order.*

Other methodological aspects should also be considered, like those stressing that the number of watersheds is in direct relation with the number of the river segments, but the manner in which the qualitative leap is made from one order to the other depends on the manner in which (stream or watershed) segments comply with the geometrical progression.

Also, in this context, one may check the classification of the watersheds according to their genesis, which states the existence of generations of watersheds. For example, in the Transylvanian Depression, watersheds have been classified according to their genetic features (Mac, 1972; Josan, 1979; Irimuş, 1998, 2006 etc.), on which occasion, two or three generations of watersheds have been established. As a conclusion, it is important to make a correlation between the results of the mentioned authors, and those obtained by establishing the order of the watersheds, applying the law of the number of watersheds, in order to seek a correspondence between them. Of course, there is a correlation, except for the watersheds with a higher order rank than the fifth or the sixth order of the watersheds, which have a probability of appearance only when the measured area becomes larger. This is because, in the case of the law of the order of watersheds, a qualitative leap is performed as the number of lower order segments grows, and they are more numerous as the surface becomes larger.

In the other cases (for the first to the fourth orders), if a map with the genetic classification of watersheds is overlapped with a map where watersheds are presented according to the mentioned method, the result is not a „perfect” correlation between them, because of the different principles on which each of the two methods are based on (Roşian, 2008). It is sufficient to note just one of the differences, meaning that when two third generation of watersheds “meet”, the resulted order of the watershed belongs to the third generation of watersheds, while if the same watersheds are analysed according to the law of the order of watersheds, the result is an increase in order simply due to their junction.

4. CONCLUSIONS

Several conclusions have been drawn as a result of the presented methodology establishing the law of the order of watersheds and its application on the 12 models.

The law of the order of watersheds, as it was named, by analogy, after the Law of the order of streams, is valid for all the case studies taken into consideration. This is a result of the manner in which the values of the number of segments of the watersheds, of different orders, are shown in the tables, as well as in semilogarithmic coordinates representations.

Knowing the order of the watersheds in this way, one may compare the resulted values with those specific to the order of the bordering streams. Even if the watershed network was created by the evolution of the drainage network, it has been demonstrated that the order of the bordering streams and of the watersheds is not always the same. This is mainly because a major watershed of the fourth or the fifth order, borders two drainage basins, which are also drained by two rivers, whose orders are not always the same as a result of their evolution. The recorded difference, that the order of the watershed is higher than that of the bordering streams, is in most cases due to the way in which the confluence takes place between the main collector

and the first or second order streams, which divide the watershed area. This difference is higher as the number of the segments of lower order streams, which fragment the watershed and increase its order, do not make any confluences between them, in order to increase the order of the drainage network, but flow directly into a higher order collector.

The assessment of the relation between the order of the streams and the order of the watersheds led to certain results, on the basis of which one may conclude that in the Transylvanian Depression the problem of the correlation and similitude between the drainage network and the watersheds remains open.

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MORPHOMETRIC ASPECTS OF CÂRCINOV BASIN (CÂNDEȘTI PIEDMONT)

MARIA CHIVULESCU¹

ABSTRACT. – **Morphometric Aspects of Cârčinov Basin (Cândești Piedmont).** The basin of Cârčinov Valley is situated in Cândești Piedmont, being one of the tributaries of Argeș River which ensures the drainage for an area of approximately 202.7 km. The altitude becomes lower and lower from the North of the region (742m) to the South (225m) where it flows into the Argeș River. The most important part of Cârčinov basin is represented by hypsometric values between 400-500 m, namely 28.60% of the analysed area. The analysis of the relief fragmentation provides an important geomorphologic clue regarding the dynamics and distribution of the shaping processes from different time stages, data that will be taken into consideration within the process of sustainable development of the researched area.

The degree of the relief fragmentation, with values included between 0-200m/km² is the result of some complex causes and conditions as for instance: the setting of the basic level in general and of the local one, the slope, the neotectonic movements, etc.

The inclination of the sides defines different categories of sides: with small slopes, between 0 and 2 degrees which characterize little inclined grounds in the neighborhood of water meadows and small rivers, with middle slopes between 16-17 degrees which are found on the most important part of the area of Cârčinov Basin and with steep slopes under 27 degrees which are met on the fore sides of the terraces and fields.

The exposure of the sides determines a certain caloric behaviour of the soil with implications on the regime of humidity, geomorphologic processes and, last but not least, on the agricultural utilization and exploitation. The way the network of rivers is organized represents one of the factors that condition the character of the relations between different current morphogenetic processes which are, most of them, subordinated to the drainage down the sides or in hydrographic channels of different size orders.

Keywords: *Cândești Piedmont, Cârčinov, slopes, hypsometric values, energy of the relief.*

1. INTRODUCTION

In the existing geographic literature, one cannot cite a work whose object of study is exclusively the natural environment of Cârčinov hydrographic basin. However some references have been made to different problems which appear within this basin. The documentation on the studied sector is based on some works of some specialists well known at national level as well as a series of cartographic materials. Thus, the history of the research is short, the bibliographical list being scanty. Moreover, the available data do not refer exclusively to the researched zone. Nevertheless there are

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some geographers and geologists who dealt closely with wider areas which encompass Cârcinov basin too. The geographic research of Cârcinov Basin represents a work related to a less studied hydrographic basin. The study of the hydrographic basin of Cârcinov River, which we started in 2000 and continued with a huge interest between 2008 and 2012 is a crowning of all the efforts tangentially made by some specialists. It is more valuable due to the fact that this region is rather little studied. Consequently, the analysis of the influence of the physical and geographical factors on the area drainage and water accumulation in the ground water layer will lead to a better understanding of the peculiarities of this territory with a view to taking some right decisions regarding the territorial development and the management of the water resources.

The studied unit, Cârcinov Basin of Cârdești Piedmont (fig. 1) has an area of 202.75 km². This is inclined from the North on a length equal to 37.75 km² and a medium width of 6.12km (max.l = 9.25 km and min.l = 3 km). Analysing the topographical charts, we noticed that globally the area of Cârdești Piedmont inclines from the North to the South. Thus, the maximum height of 744.6 m is found on the Perilor Hill (Valea Mare village, Dâmbovița County, the place where Valea Mare, a tributary of Cârcinov springs from) and 742 m is the height of Pietrelor Hill (Cârdești Deal village, Dâmbovița county, the place where Cârcinov springs from), heights that coincide with the northern limit of the studied unit (fig. 2).

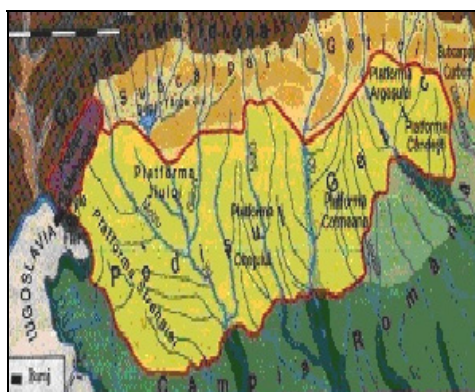


Fig. 1. Cârdești Piedmont.

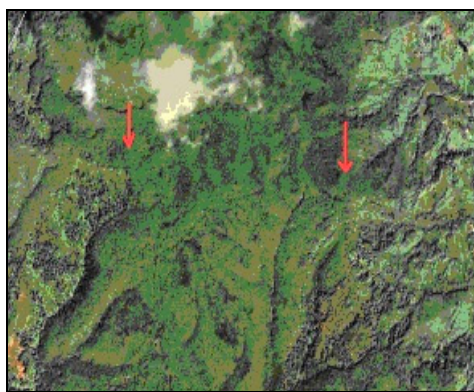


Fig. 2. The Perilor Hill and the Pietrelor Hill.

Among the rivers that spring and enlarge within the boundaries of Cârdești Piedmont, Cârcinov is the most important both for its length and for the area of its hydrographic basin. Starting from Beleți to the North, Cârcinov Valley bifurcates, both its branches having the same name, Cârcinov. Due to this fact, the necessity of a specific name for each valley was felt. Thus, the branch that springs from under the Stones Hill and flows through the east side of Cârdești de Deal and then through Boțești and Dobrești was named the Eastern Cârcinov and the branch that has its origin under the Dealul Corbului (599 m) and flows through Negrești was named the Western Cârcinov. The Eastern Cârcinov is the most important branch in terms of length and area. It springs from the northern extremity of Cârdești Piedmont, more exactly from the point named Dealul Pietrelor (742 m) and its tributary on the right, Valea Mare, has its origin under Dealul Perilor (744 m), the highest point of the region. The

unit in which Cârčinov Valley is encompassed is not only a morphologic element or a morphohydrographic corridor but it also offers to the interested one a complex landscape with intense morphodynamics. After the research done so far we discovered that Cârčinov stream developed on a friable, predominantly sandy geologic bedrock.

The minimum elevation of 225 m is found in the zone where Cârčinov Valley intersects with Argeș water meadow (on the watershed on the right of the mentioned stream) (fig. 3).

This difference of level of almost 520 m is the result of the positive movements more and more noticeable towards the foot of the mountain that took place in the region during the Quaternary. But the analysis of the elevation also reveals that the area of Cârdești Piedmont inclines in the northern zone from East to West with almost 40 m, whereas in the southern zone it is inversely inclined, from West to East, with almost 180 m. These differences of levels are also the result of the vertical tectonic movements during the Quaternary.



Fig. 3. The confluence of Cârčinov with the Argeș.

Cârčinov stream evolved on a friable predominantly sandy geologic bedrock. The valley has specific climatic conditions imposed by the channeling of the air masses among it, by a various layer of soils and by a vegetation made of a mixture of species specific to the steppe as well as to the forest of zonal type and of those specific to the water meadows. Cârčinov Valley shows, from the economic and geographic point of view, some features that differentiate it from the whole Cârdești Piedmont: advanced settlements, widely used ways of communication, diversified agriculture due to the various landforms and soils. From this blending of the natural and anthropogenic elements there appeared a geographic complex or landscape whose analysis should emphasise, first of all, the connections that exists among its components. This main purpose is the one which subordinates the necessity of finding the elements that differentiate it from the valleys and the divisions from the East or from the hills in the western side of Argeș County, units by which Cârčinov Valley is flanked.

The northern zone, where Boțești is situated too, is the most suitable for such an analysis. It interweaves the morphostructural elements specific to the entire basin. At the same time, it is individualized by its lithology and by the monoclinical structure of the Pliocene flanked sands in the North and by the Quaternary gravels in the South.

A similar differentiation can be noticed from the pedological, biogeographical and climatic point of view. To the North of the village Boțești, within Cârdești Plateau, the forest grown on grey soils prevails and to the South of the city of Topoloveni the steppe influences are very strong, a fact which can be easily deduced from the medium multiannual amount of precipitation that in Pitești and Topoloveni is below 500 mm. Thus the middle zone of Cârčinov Valley remains a zone of transition of forest steppe type.

The presentation and interpretation of the morphometric data are important for the rural and urban development of the researched area, allowing the practitioners to achieve the sustainable development and planning of the analysed territory, foreseeing and avoiding certain geomorphologic hazards and risks.

The multi-stage layout from North to South of the relief of Cârčinov Valley is shown on the hypsometric map where we notice six classes of hypsometric values included among the extreme altitudes of this area (200 m and above 700 m).

The village of Boțești is situated in Cârdești Piedmont, the eastern subdivision of the Getic Plateau. The maximum altimetric elevation from this unit is 557 m and the minimum one 380 m in the Eastern Cârčinov water meadow. The level difference of 177 m for this area sustained by the prevailing friable petrography explains the high erosion potential and the dynamics of the landslide processes.

2. MATERIALS AND METHODS

In the present study we used the topographic maps 1:50000, 1983 version, which offered the detailed representation of some morphometric parameters. On this ground the hypsometric map, the slopes map, the sides exposure map and the fragmentation depth map were achieved, maps that we considered sufficient for the hypsometric characterization of the researched basin.

3. RESULTS AND DISCUSSIONS

While elaborating the hypsometric chart of Cârčinov Valley starting from the topographic chart 1:50000, I noticed that the specific hypsometric curves are those of 700 m, 600 m, 500 m, 400 m, 300 m. The curve of 700 m is situated in the northern part of the unit, including a small area of 0,85 km² which represents 1%.

The 600m curve is situated nearby the 700 m curve advancing and drawing back along the water threads/streams and encompasses a area of 14.5 km², namely 7.4%.

The 500m curve includes a area of 44 km², namely 18.25%.

The 400m curve includes a area of 66.5 km², namely 28.60%.

The 300m curve includes a area of 56.7 km², namely 27.12%.

The rest of 30.20 km², namely 17.26% is situated under 300 m.

The most important part of Cârčinov basin is represented by the hypsometric values between 400-500 m, namely 28.60% from the analysed area which coincides with the biggest part of the hilly relief, followed by the values between 300 m and 400 m (27.12%), specific to the central-south part. Within the water meadow area the most important is the value of 200-300 m (approximately 17.26%) from the area of the basin (fig. 4).

By calculating the density of the relief fragmentation and from the analysis of the spatial distribution of its values we obtain the morphogenetic features regarding the evolution of the hydrographic network and of the intensity of the linear erosion

processes in interrelation with the lithological and biopedoclimatic conditions existing at the local level. The density of the relief fragmentation for Cârcinov Basin has values between 0.1km/km², the highest values of the relief fragmentation density 3.1-4 km/kmp insularly appear in the analysed perimeter (their area is 8 km², respectively 4% from the basin's area). In the northern part the fragmentation density is between 1.1 and 3 km/kmp, a fact that is explained by a big confluence relation which in its turn is justified by the relief's energy going up (att the contact with the morphostructural units) and by the presence of the friable rocks.

The first sector mostly laps over the south part of the unit and the rest is represented all over the unit in proportion of 23.74%, namely 49.5 km².

The second sector is met on the whole area predominating in the central north part in proportion of 37%, namely 76.5 km².

The third sector predominates in the central part. It represents 35%, namely 68.7 km².

The fourth sector is weakly represented within the unit and it represents 4%, namely 8 km² (fig. 5).

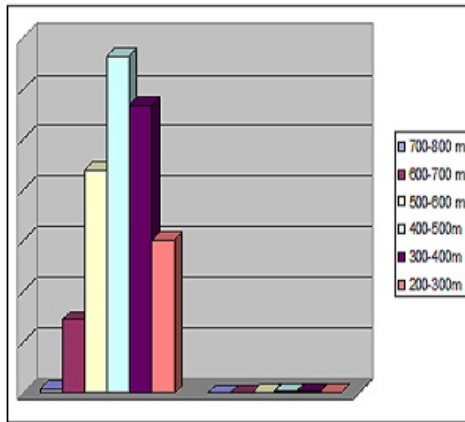


Fig. 4. The hypsometric values diagram.

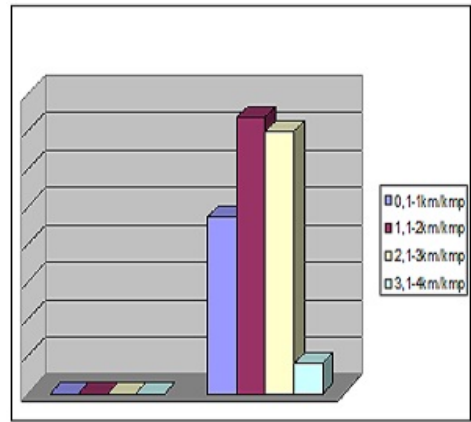


Fig. 5. The relief fragmentation density diagram.

The analysis of the relief fragmentation density offers us an important geomorphologic clue regarding the dynamic and repartition of the shaping processes from different periods, data which will be considered in the process of sustainable systematisation and development of the researched zone. The depth of the relief fragmentation shows the depth to which the vertical erosion reached, sustained by the lithological-structural conditions, being conditioned by the general or local erosion. This geomorphologic element plays a significant role in the process of rural and urban systematisation and planning because, depending on the degree of relief depression, some types of engineering work will be carried out. For example, the evaluation of the ground in order to build roads, and of the characteristic elements: cuts, fills and their cutting slopes (suitable for drippings, gappings and landslides) will accordingly to the values of the relief energy in the area that was chosen for development.

The map of the relief energy (fragmentation) emphasises the degree of depression of the Cărcinov Valley from which we can deduce its way of evolution (the intensity of erosion, the valley adaptation to the structure, the behaviour of the rocks in relation with the fluvial erosion, etc). In the village of Boțești the depth of the relief fragmentation records values between 51 m (Grecilor Valley and the Eastern Cărcinov) and 150 m (insularly on the two streams).

Although the lithological conditions are the same, the action of deepening of the valleys took place according to a series of causes. We notice four characteristics of the zone: a greater depth of the fragmentation to the north of the 700 m curve with values of 180-200 m/km² and with values of 180 m/km² to the south of the 600 m curve which represents 4 km², namely 2% of the territory.

a) a smaller depth of the fragmentation than the first is met along the main arteries all over the area, with values between 101-150 m/km² representing 13 km², namely 6.9% of the territory.

b) the widest area in the zone is characterized by a relief energy with values between 51 and 100 m/km², representing 67 % of the territory.

c) a depth of fragmentation between 0-50 m/km² representing 27.75 km², namely 23.18%.

In conclusion one can maintain that the degree of the relief fragmentation is high enough with values between 0-200 m/km² and it is the result of some complex causes and conditions among which: the setting of the general basic level and of the local one, the slope, the neotectonic movements, etc. (fig. 6).

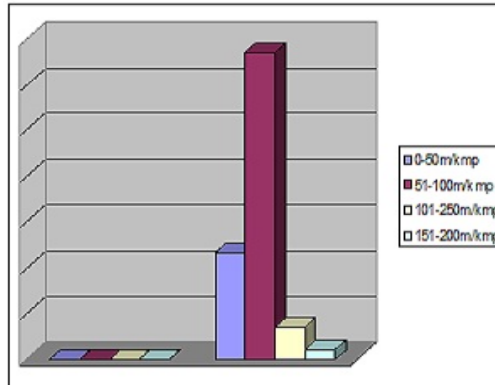


Fig. 6. Relief fragmentation diagram.

Analysing the slopes map one notices a differentiation between the values of declivity in the valley sector of the researched area and those recorded in the adjacent sectors, the hills and the hillocks in the plateau unit.

For the map of the slopes we calculated the slope angles and found that their value reaches 27 degrees. But this slope is not uniform. For the researched zone I noticed, after analysing the map of the slopes, that the value of the slope angles is high enough on the front side of the terraces and fields and lower at the level of the watersheds and water meadows. Within this unit we distinguished eleven categories of slopes which influence in different ways, from a space to another, the processes of relief shaping.

The high values of inclination of the sides represent a premise for the starting of the gravitational processes among which the most active ones are the landslides. Beside these, washings and linear erosion under various forms (dripping, gapping, torrents) are also frequent.

Landslides are phenomena that were remarked along Cârčinov Valley as far back as the first part of our century. Among these we can mention in mod those on the sides of the Potop Valley and of the Eastern Cârčinov. According to the intensity and the resulting forms the landslides of the sides of Cârčinov Valley and of the tributary valleys are phenomena that involve the shifting strata to a great depth. In the receiving basins of the torrents and on the fore side of the sides we meet superficial landslides affecting the reduced areas (Fig. 7).



Fig. 7. Landslides – Boțești village.

4. CONCLUSIONS

The morphometric parameters have a special importance in evaluating the general morphology of a region but also in evaluating the morphogenetic potential of a certain region. In our case the analysis of the morphometric parameters shows a decrease of the morphogenetic potential in the upper basin of Cârčinov towards the lower basin, a fact that is illustrated by the frequency and intensity of the current geomorphologic processes from the middle and upper basin.

The inclination of the sides strongly contrasts with the even appearance of the watersheds and with the flat one of the valley bottom. The variety of the landforms in the case of the valleys, the origin, the intensity of movements and their amplitude, the energy of the relief, the age and the variety of the absolute altitude of the piedmont back sides lead us to distinguish three geomorphologic regions within Cârdești Piedmont: the northern zone with a lot of structural forms, the central and south-western zone with landslides, alluvial cones and few terraces and the south-eastern zone characterized by the development of the terraces and by the reduction of the slope processes.

The anthropogenic activity which affects mainly the water meadows as well as the watersheds and the sides generated a series of microforms of a great variety represented by lakes, gravel plants, holes, ditches, roads, etc. The sand and gravel banks are exploited in the minor bed of Cârcinov, the clay is used for bricks and terracotta production and the artesian waters from Priboieni village are used for irrigation and in households.

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STRUCTURAL MEASURES AGAINST FLOODING IN CLUJ AND DEJ HILLS

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ABSTRACT. – **Structural Measures Against Flooding in Cluj and Dej Hills.** The effects of hydrological phenomena of risk are generally adverse to the environment, generating a lot of damage. Thus the management activity of these phenomena and a planned activity to prevent and combat their negative effects is absolutely necessary. To mitigate the negative effects of hydrological phenomena of risk or reduce the risk, people have completed technical hydrological works to combat the destructive effects of water (flood protection works, to correct torrential formations and reforestation, works for soil erosion control and works to remove excess humidity). The main flood protection technical works existing in Cluj and Dej Hills are the embankments. Regarding these technical works we can mention that not all of them operate at designed parameters.

Keywords: *floods, structural measures, flood protection works.*

1. INTRODUCTION

For thousands of years, people have been attracted by riversides because these areas offered them benefits like drinking water, fertile soil and smooth terrain, ignoring the destructive force of water, minimizing it, or even taking a risk.

Also, for thousands of years people have made various hydraulic works to mitigate the negative effects of floods, or to reduce the risk of flooding. However, as proven by the whole experience of confrontation with floods, in spite of all the efforts, it turns out that the risk cannot be completely eliminated.

The study aims to assess the status of the existing flood defence works in Cluj and Dej Hills area. In the beginning we discuss about the types of measures which may be adopted against flooding. Further we consider the existing flood defense works in Cluj and Dej Hills, with special attention paid to the problem of the status of the existing flood defense works, explaining the causes of this situation. Then we listed some projects with proposals regarding flood defence works, and finally we briefly concluded with some of our own opinions about flood defence measures in Cluj and Dej Hills area.

2. TYPES OF DEFENCE MEASURES AGAINST FLOODS

First of all we have to mention that two types of measures may be adopted against floods: structural and non-structural.

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2. 1. Structural measures

According to Stănescu and Drobot (2002), structural measures can be classified as follows:

- Measures to reduce flood peak flow:
 - permanent bodies (accumulation) of water;
 - inpermanent bodies (accumulation) of water;
 - works of terracing and soil conservation on hillsides;
 - afforestation;
 - rehabilitation works, to ensure the natural attenuation of flood through the accumulation of water in the floodplain;
 - works of rainwater retention and delay of its flow, especially in urban areas;
 - water derivations;
- Measures to reduce the maximum levels in the bed of the river:
 - cleaning of riverbeds;
 - works of regularization of riverbeds;
- Measures to reduce flood duration:
 - drainage works;
- Measures to protect the goods and people from the flood plain:
 - river dykes and concrete dams.

2. 2. Non-structural measures

Non-structural measures are soft measures to prevent flooding and in case of flooding they include legislative and organisational measures.

The protection of the population against flooding only by engineering is an old concept. The reality unfortunately confirms this fact due to the high number of damages caused to the environment and the population.

Some of the inconvenients related to the construction of water projects against flooding are: the high cost of implementation and maintenance of these works, increasing vulnerability to the shelter offered by them, degradation of ecological balance, improper calculation of the parameters used in the design of older hydraulic works in the context of global climate change etc.

Of course, under certain conditions or in some territorial locations, some structural measures are absolutely necessary to limit the damage caused by flash floods or floods. They are, however, supported by non-structural measures, "soft-measures" in international specific literature.

There is a specific legislation in the European Union, regarding the defense against flooding including *laws and other normative acts*. In Romania one can enumerate: Law 107/1996-Water Law, amended and supplemented; Government Decree 447/2003-detailed rules concerning the drafting and content of natural risk maps; Government Emergency Decree 21/2004 relating to the national system of Emergency Management, approved with amendments and completions by Law No. 15/2005, etc.

Also, in Romania, the Ministerial Committee for Emergency Situations of the Ministry of Environment shall prepare the national strategy for defense against flooding.

The National Strategy for Flood Risk Management is the legislative framework for the preparation and adoption of specific measures relating to:

- the knowledge of the risk of flooding;
- monitoring the phenomenon of flooding;
- taking preventive measures;
- consideration of the risk of flooding in the territorial planning;
- preparation for emergencies;
- reconstruction;
- learning from the experience.

Organisational measures refer to the *organisation of the national system* for the management of emergency situations, the drawing up of *defence plans*, the development of specific collaborative *international projects* and *programmes*, or *educational activities*. *Educational activities* for the population include *simulation exercises* for defence against flooding, *public alert exercises*, *information campaigns* on flood risk management within local communities, or *lessons in schools* for children and young people (themed meetings) to develop a more aware and more responsible attitude in situations of risk, or in relationships between people.

The regional directorates of the “Romanian Waters” National Administration and the County Councils may be the beneficiaries of PHARE *programmes*, by carrying out contracts for the rehabilitation of flood-affected water projects, or for the reduction of the destructive effects of flooding. For example, in 2005, Cluj County Council has received the 371,420 euro, through PHARE/2005/017-690.01.03- “Measures against disasters caused by floods”, intended for the rehabilitation of bridges damaged by flooding in Cluj County.

3. MATERIALS AND METHODS

In order to identify the problems at the existing flood defense works in Cluj and Dej Hills presented in this article, we studied the existing bibliography about risks and particularly about hydrological risks. In addition to the international and national specific literature about risks, we also used the EU and Romanian legislative methodology (laws, decrees, directives) on flooding.

We completed this work with field observations, also shown by photos taken in Cluj and Dej Hills in September 2008.

We have to mention that this study is part of a more extensive research on “Hydrological risk phenomena in Cluj and Dej Hills and Almaş-Agrij Depression”. This study is based on topographic documents and hydrological data based on measurements obtained from hydrological stations, data and information from public and specialized institutions.

4. RESULTS AND DISCUSSIONS

4. 1. The existing flood defense works in Cluj and Dej Hills

In Cluj and Dej Hills, dykes and river bank consolidations have been achieved in larger number, followed by recalibrations and river bed correction works, while soil conservation works are less usual.

The *dykes (embankments)* are the most common works of defence against water overflows, seemingly one of the first man-made works. They are very useful in limiting the frequency of floods. Through the development of embankments parallel to the stream, a prevention of the water overflow is achieved as long as the maximum flood level is lower than the calculation level (fig.1). But dykes can create a false impression of safety and in the

case of major flooding the damage can be much higher than in their absence - by creating the effect of strangulation, or worse, by breaking them. Also, the impact of the construction of the dykes may be negative from the ecological perspective, or even economically or socially.



Fig. 1. Dyke on Someșul Mic River, Cetan village (September 2008).

Support walls have been built more on Someșul Mic tributaries, in settlements near the confluence, in built-up areas with a higher population density, for example in the case of Fundătura village, on Lujerdiu River (fig. 2).



Fig. 2. Support wall on Lujerdiu River, in Fundătura village (September 2008).

In the same village, Fundătura, the water flow section was expanded, next to the bridge, by rebuilding and by raising the road bridge (fig. 3).

Cleaning works by removing the natural vegetation were made on Lujerdiu Valley, as presented in figure 4. Also, the same type of works are required on Chinteni River, or on Lonea River (fig. 5).



Fig. 3. Rebuilding of the road bridge on Lujerdiu River (Fundătura, September 2008).



Fig. 4. Cleaning works by removing the natural vegetation on Lujerdiu River (September 2008).



Fig. 5. Lonea River near the hydrometrical station (September 2008).

We can mention that the cleaning works by removing the natural vegetation which have been carried out in the riverbed of Chinteni River in 2006 had an expected positive effect: the reduction of flooding on the neighbouring land. However, in some valleys, it is absolutely necessary to perform this type of work, especially along the ones where cleaning works have not been carried out since the 1960s, as in the case of Lonea River (fig. 5). Without them, the result may be the production of flash floods with numerous damages in some areas of the valley.

Recalibrations and corrections of water courses are specific works, which in the short term give very good results in the reduction of the maximum level of the water and then of the overflows. The correction of water courses refers to shortening the route between two cross-sections, through the detachment of all or part of the loops. By increasing the longitudinal slope of minor riverbed, a faster transit of the water is obtained. Recalibration of riverbed is carried out by the operation of cross-section enlargement or deepening, in order to increase the volume of water passed through, lowering the risk of flooding on riparian lands. Figure 6 shows recent correction works on Valea Mărului River, in the area of confluence with Someșul Mic River. These works had to be done as a result of the many negative effects of flooding and back stream phenomenon that occur on the tributary. The works were needed to safeguard the railroad and especially the railway bridge which is close to the confluence.

Thus, in Cluj and Dej Hills there are some hydraulic works, intended to defence against flooding the settlements, the socio-economic objectives, farmlands and communication networks. However, the continuation of these works remains a necessity of the first order, as long as the annual flooding leads to damages in numerous bordering localities. In conclusion, the risk areas with a higher probability of being affected by flooding are:

- Dej area;
- tributaries of Someșul Mic River, not equipped with hydraulic works, between Cluj-Napoca and Dej.



Fig. 6. Correction works on Valea Mărului (September 2008)

4. 2. Critical presentation of the main existing flood defence works in Cluj and Dej Hills

Special attention has to be paid to the status of the existing flood defence works in Cluj and Dej Hills.

Regarding the main existing flood defence works in the studied area, one notices that not all of them work at the designed parameters. We find that the current situation of these defence works is mainly due to damage caused by flooding and ice produced on the rivers. Also, the incorrect maintenance of equipment, unfinished repair works, lack of funds and an incorrect promotion of documentation for restoration and repair, are other causes for this situation.

The existing flood defense works in Cluj and Dej Hills that have shortcomings and do not work at the designed parameters are the following:

a) Nadăș River regularization in Aghireș-Cluj-Napoca area (8.9 km long). There are some damaged works (thresholds of water, defence banks) due to the floods. It is necessary to repair the works and new works have to be built to ensure the continuity of the lines of defence;

b) Căpuș River regularization, at Căpușu Mare (2 km long and 3.7 km bank consolidations), where thresholds and banks of defense are damaged by floods and residents;

c) Salca River regularization, at Dej (2.2 km long). The riverbed is clogged in the middle and lower sector and thresholds and support banks are damaged.

During the 2002-2007 period, works of defence against floods in Cluj and Dej Hills have been achieved by completing objectives started in previous years, as well as newly promoted objectives. These objectives have been funded from the state budget and external credits. The latter is part of the funding agreement between Romania and the European Investment Bank signed in Luxembourg on 04.08.2000 and Bucharest on 09.08.2000, ratified by the Government Decree No. 97/2000, as amended by the Emergency Decree no. 150/2001.

The scheduled works were the following:

- *“Improvements against the floods caused by Someșul Mic River, in Cluj-Napoca-Dej sector”*. In the framework of this project, in 2003 the works in phase I were provided for completion (riverbed correction on Lujerdiu River and the left bank of Someșul Mic River) and works on stage II of this objective started (improvement and adjustment of the Someș river);

- *“Reconsideration of flood defence works on Căpuș River”*. In this project, the objective related to Gilău village was aimed to be complete in 2003.

For the period 2007-2015, the following flood defense works are proposed:

- improvement of the defence against floods of Dej City on Someș River, including a non-permanent accumulation of water with a capacity of 10 million m³ and an embankment along the right river bank for 10 km in length;

- improvement of watercourses in the area of Dej City:

- improvement on Ocna River - 4 km riverbed correction;

- improvement on Olpret River - 20 km riverbed correction and 3 km of bank consolidation;

- improvement of watercourses of Someșul Mic tributaries, in Cluj-Dej sector, which includes water accumulation in the upper reception basin for mitigation of flood waves;

- improvement of watercourses of Someșul Mic tributaries in Cluj-Napoca.

The long term proposal (after 2015) provides the following flood defense works:

- improvement on Jichiş River - 4 km riverbed correction and 0.5 km of bank consolidation;
- improvement and adjustment on Nadăş River, the sector between Aghireş and Baci - 22 km riverbed correction, and 6.5 km of bank consolidation.

5. CONCLUSIONS

The effects of hydrological risk phenomena are generally adverse to the natural environment, generating a lot of material damages. A management activity of these phenomena and a planned activity to prevent and combat their adverse effects is absolutely necessary. To mitigate the negative effects of hydrological risk phenomena or to reduce the danger, people have completed technical hydrological works to combat the destructive effects of water (flood protection works, correction of torrents, afforestations, works to combat soil erosion, works for removing excessive soil moisture).

Regarding the main flood defence works that exist in Cluj and Dej Hills, one must mention that not all of them function at designed parameters. The current situation of these works is due mainly to the damage produced by flooding, by the ice on rivers, improper maintenance of the equipment, incomplete repair works, lack of funds, or by non-synchronized documentation for the works of restoration and repair.

Assessing all the analysed elements previously presented, and the prognoses about the future socio-economic development in the Someş catchment area, we consider that it is necessary to correlate the proposals regarding measures to combat the destructive effects of the waters between them. These proposed measures are: flood defence works, works to correct torrential bodies, afforestation, works for removing the excessive moisture of the soil, works to combat soil erosion.

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MINERAL WATER FOR TREATMENTS: SUMMARIZED PRESENTATION OF THE BATHING CULTURE

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ABSTRACT. – **Mineral Water for Treatments: Summarized Presentation of the Bathing Culture.** Using the mineral water has a long-lasting tradition; it can be considered almost as old as the ancient civilizations. Mineral and thermal waters were used for cleaning, bathing and drinking. In old times their healing effects were the primary reason for using them. Throughout the centuries the bathing culture went through many changes according to the trends and ways of thinking of successive eras. The nineteenth century was the last time when health resorts flourished, followed by the rise of the spas. Nowadays a mixture can be observed between the new recognition of the healing effects of the waters and the usage for beauty and relaxation practices. In this paper we try to put together the information that appeared separately in many works and to give a general overview of the bathing culture from the beginnings until the third millennium.

Keywords: *mineral water, health resort, spa, Europe, healing, relaxation.*

1. INTRODUCTION

Papers focusing on the historical perspectives of using the waters, bathing culture and balneology were published mostly during the last decades. One volume edited in 1990, with a very well worked historical and scientific background, Medical History Supplement No. 10, contained ten essays that talk about the development of the health resorts in different time series and places of the world.

All papers dealing with this topic have references from 1990s and after 2000. Two works, besides the Medical History Supplement, have a large reference list dating back to the 19th or even the 18th century. These are “Bottled water, spas, and early years of water chemistry” by Back et al. (1995) and “Balneology, mineral water, and spas in historical perspective” by Routh et al. (1996). Most of the authors reflect to these works.

Many papers start with dating back the nowadays so common word “spa” and searching for its origin. The word “spa” comes from a spring name, Espa, in a Belgian town in the 14th century. The term “spa” can also be originated from the Latin phrase “*sanitas per aquas*”, meaning “health through water” (Back et al., 1995; Lund, 2000a; van Tubergen & van der Linden, 2002; DeVierville, 2003; Frost, 2004, Katz & McBean, 2008). Very interesting is the fact that, as shown above, the first to mention this origin

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is Back et al. (1995) while most of the authors used to refer to Lund (2000a, b), van Tubergen & van der Linden (2002) and DeVerville (2003). Back et al. (1995) took this information from Licht (1963) and Croutier (1992). Licht (1963) actually says that in the old Walloon language the word “espa” means fountain, and the settlement near Liège was named after the fountain/spring. Croutier (1992) also mentions the origin form Latin word “*spargere*” that means to scatter, to sprinkle.

One work is talking about a non-Latin origin of the spa culture. Kepinska (2004) says that the bathing culture was taken over by the Romans from the Ancient Greeks and the motto “health through waters” as well. So in this way “spa” comes from the Latin translation for this Greek motto. Originally Fytikas (1999) refers to the Latin motto “*mens sana in corpore sano*”, that means “healthy mind in healthy body” that was borrowed from the Ancient Greeks.

Hot springs have been used already from the ancient times by the Egyptians, Jews, Romans, Greeks and Turkish people (Lund, 2000a). Today, treatment and preventive therapy are both used at medically supervised health resorts, especially in Europe and Japan (Lund, 2000a).

After the American influence on the original spa practices, the term “spa” is used for a large scale of health procedures, relaxation practices and wellness as well. “Health resort” has a meaning of medical treatment through waters. Gutenbrunner et al. (2010) suggests that the nowadays used terms need to be clarified and several regulations in their practice have to be made.

The American perception about a spa differs from the European one. U.S. spas give more importance to exercise, reducing stress, beauty practices, lifting depression and losing weight (Lund, 2000b; Thorne, 1995). In the USA, the largest group comprises the so-called “day spas”, followed by the “Resort/hotel spas”, while “destination spas” form the smallest group with only 25 listed in North America. In 2001 there were approximately 156 million visits made to spas; 68% of these were to “day spas” (Frost, 2004).

In the European spa distribution, Bozikova (2009) defines three orientation fields. First, there are countries not rich in mineral waters that are under the influence of American short-time stays in relaxation centers (Sweden, Norway, Finland, Denmark, the Netherlands, Great Britain and Ireland). Secondly, apart from these countries, the Central and South European region has a long-lasting tradition in using the waters. There is a continuous medical supervision in health resorts. And third, there are the leaders in balneology, like Germany, Italy and Czech Republic, where the classical balneotherapy is used.

Central Europe concentrates most of the spa leaders of the continent. Germany is for sure on the first place with about 250 traditional, high-developed enterprises and clinics in operation. In Austria there are about 200 spas, in Czech Republic about 70 spas, followed by Poland, Hungary and Slovakia. Coastal states like Estonia, Latvia and Lithuania combine balneotherapy with thalassotherapy (Bozikova, 2009). In 1992 about 2,730,000 Germans visited spas in order for drink, bathing, or make use of other treatments with the waters. The number of Italians in spas was around 1,800,000 and about 5,500 British people and 640,000 French took bath in their own country spas (Weisz, 2001). In 1993 the 37 Czech health resorts hosted 270,000 Czechs and 70,000 foreign patients (Thorne, 1995).

Several famous health resorts of our era were fashionable and well known balneology centers already in the 19th century. In Germany these were Baden Baden, Wiesbaden, Bad Ems, Aachen, Bad Homburg, Bad Kissingen (Coley, 1990; Brockliss, 1990; van Tubergen&van der Linden, 2002; Blackbourn, 2002). Fashionable French spas were Vichy, Aux-des-Bains, Forges, Aix-en-Savoie and Bourdon-Lancy (Coley, 1990; Brockliss, 1990; Weisz, 2001; Blackbourn, 2002; Frosch, 2007). In the present Czech Republic the most famous ones were Carlsbad and Marienbad, while in Slovakia it was Piestany (Thorne, 1995; Lund, 2000a; Blackbourn, 2002; Bozikova, 2009). Montecanti and Lucca are worth mentioning in Italy, Bad Ischl in Austria, Varna in Bulgaria, Bath in the UK and of course Spa in Belgium (Brockliss, 1990; Blackbourn, 2002).

2. THE VERY BEGINNINGS OF THE BATHING CULTURE

The first bathing practices in natural springs are to be found in East Asian cultures. Chinese traditions of bathing date back to about 3000 years. Springs were used besides irrigation and domestic use for disease treatments and recreational purposes. One of the most famous springs was Huaqingchi hot spring during Tang Dynasty (Ji-Yang, 1995). Some of the geothermal springs had a strategic significance and were not shared with the civil population. They could be used only by the army (Kepinska, 2004).

According to the traditional Chinese medicine, the so-called “cold diseases” like rheumatism and mobility problems were treated with geothermal water, while diseases accompanied by high temperature were treated with cold spring water. The skin diseases needed sulphurous water (Kepinska, 2004).

In Japan there is also a long tradition of using the mineral hot springs for bathing and medical purposes that dates back to 700 B.C. At a spa there were 3 separate rooms for bathing: one for the samurai and priests, one for women and one for the general public (Altman, 2000). Detailed descriptions of springs and their therapeutic effects were described and published many centuries after, between 1710 and 1730 (Sekioka, 1995).

All healing traditions of the East place great emphasis on the balance of mind, body, spirit and environment as the basis for health (Cohen & Bodeker, 2008, chapter 3).

In Maori culture in New Zealand all natural resources were called “taonga” that represent valuable natural treasures derived from gods, that have to be preserved for future generations (Severne, 1995). Bathing in hot water pools was mainly used for skin diseases, arthritic and rheumatic ailments (Severne, 1995).

Bathing was considered luxurious and keeping the hygiene in ancient Egypt (Bell, 1850). Pharaoh Cleopatra established a spa close to the Dead Sea in about 25 B.C. (Erfurt-Cooper & Cooper, 2009).

In North America the bathing practices of the Incas were first described by the Spanish conquerors, historians, and missionaries (Kepinska, 2004).

On the European continent, Etruscans, Greeks and Romans were the first users of mineral waters in baths. Latin authors like Tibullus wrote works that describe Etruscan upper classes bathing habits in around the 10th century B.C. (Cataldi&Chiellini, 1995). In the 4th century B.C the Romans increased their political and military pressure on the nearby people, also on Etruscans and the whole Italian peninsula. Roman soldiers and travelers began to assimilate many of the Etruscan traditions, among them the habit of

using the waters for cure and relaxation (Cataldi&Chiellini, 1995). One of the most important spas, before the Roman era, was Baia, North of Naples, then Cumae and Puteoli became also famous in the Roman period for their bathing establishments (Jackson, 1990; Cataldi&Chiellini, 1995). After the Etruscan civilization was crushed, Greeks also had a great influence on the bathing culture of the Romans (Cataldi&Chiellini, 1995).

Ancient Greece was a center where balneotherapy developed and spread over the Mediterranean region (Kepinska, 2004). In Greece there were three types of baths: the sweat bath in a hot dry place (laconicum), the hot water bath and the steam bath (Cataldi&Chiellini, 1995). Bell (1850) mentions one undressing room, one warm room with a tepid bath (Tepidarium), one cold bath (Frigidarium) and a hot vapor bath (Luconicum). Hierapolis (now Pamukkale) and Asclepieion in Pergamon were centers of balneology in the Hellenistic era. A medicine school developed in Pergamon, which can be considered the first example of organized natural healing place and physiotherapy (Kepinska, 2004). They handled physical exercises before bathing (Bell, 1850).

The Greek spa practices and traditions were taken over by the Romans and expanded through all social classes in the whole area of the Empire until the 4th century A.D. (Cataldi&Chiellini, 1995). Military presence was often a starting point for the development of such an establishment (Jackson, 1990; van Tubergen&van der Linden, 2002).

During the reign of Caesar, the number of cold and hot water baths increased rapidly. Tepidaria or Calidaria were hot baths, while Frigidaria was the cold water bath (Routh et al., 1996). It is remarkable the similarity of the Roman and Greek terms for the cold and hot baths that supports the idea of the mixture of these cultures. Pliny the Elder (23-79 A.D.) wrote about the observations that Romans had about mineral waters. Sulphurous water could repair muscular problems, the water with hydrocarbon helped the healing of interior illnesses while alkaline water treated the so-called scrofula disease (*Tuberculous cervical lymphadenitis*) (Jackson, 1990; Routh et al., 1996).

In the 3rd century A.D. in Rome there were over 1000 public baths (Cataldi & Chiellini, 1995). Three different types of baths developed after all: baths at home (balnea), private baths (balnea privata), and public baths (balnea publica) (van Tubergen&van der Linden, 2002, from Shadewalt, 1989). In the last decades of the 3rd century A.D., the spas included also beauty services like massage, depilation, hair styling, then gymnastics, libraries, meeting places, restaurants open to every social class (Cataldi & Chiellini, 1995 from Pasquinucci, 1987). Spas had a multilateral function: a place for healing, recuperation and relaxation as well (van Tubergen&van der Linden, 2002 from Shadewalt, 1989). After several years they became centers for various sexual practices (Routh et al., 1996).

The expansion of the Roman Empire resulted in a great number of baths all over Europe. In the 19th century famous spas, like Aachen, Baden Baden (now Switzerland), Bath (UK) remains of Roman bathing facilities have been discovered (Jackson, 1990; Adler, 1993). There are maps of the Roman territories on which the main spas are also highlighted, like Budapest (Hungary), Palombara Sabina (Central Italy), Bracciano (Central Italy), HammanLif (Tunis) operating during the 3rd century A.D. (Cataldi, 1993). Vassileva (1996) also mentions the Bulgarian spas reaching their first flourishing era during the Roman period.

The Romans had a great contribution to the Turkish bath culture as well, both in the architectural and social aspects (Kepinska, 2004).

With the fall of the Roman Empire in 476 and the rise of Christianity, bathing began to be discouraged and spas became abandoned (Adler, 1993; Routh et al., 1996; van Tubergen&van der Linden, 2002).

3. RISE OF THE EUROPEAN SPAS

Baths started to come into usage again on the European continent with the invasion of the Moors in the Iberian Peninsula.

According to Imamuddin (1981), Arabian baths were similar to those of the Roman period, while Power (1979) reports that the medieval Muslim baths were different and served the cleaning of the body without any treatment practices. Van Tubergen&van der Linden (2002) mention that bloodletting, enemas and drinking cures were made at a bath, but they also agree that relaxation and pleasure were the main reasons for visiting such a building (van Tubergen&van der Linden, 2002 from Looman, 1989). For women and men there were regulations for visiting these facilities (Power, 1979).

In the early years of the 10th century A.D., at the time of Abd al Rahman, in Cordoba, the seat of Arabic supervised territories, there were 300 registered public baths. The baths called Hamman were decorated mostly with mosaic works, sometimes paintings (Imamuddin, 1981; Power, 1979).

Montegriffo (1978) mentions the construction of public baths in Gibraltar in the 13th century A.D., when using the waters was not an appreciated activity in Europe. There are also writings about the rich decorated baths of Alhambra (Bell, 1850).

After the "Reconquest" in the 15th century, with some regulations Moors, Jews and Christians could also use the public baths for some decades (Power, 1979). This regulation ended soon, and public baths started to be deteriorated. The spread of the Black Death also contributed to the closure of the public bath houses (Power, 1979). Another idea states that the use of baths was prohibited after the Spanish conquest of the region (Bell, 1850) and that Christians tried to prevent even the Muslims from bathing (Imamuddin, 1981).

The habit of using the waters started again in Italy in the 16th century. Several Italian physicians began to give importance to the water therapy and balneology (Routh et al., 1996). For a better understanding of the therapeutic effects of the mineral waters, the first step was to chemically analyze the waters and get the mineral content (Palmer, 1990). Published materials from the Renaissance era are: Tommaso Giunta: *De balneisomniae qua extant*, 1553, encyclopedic work, Venice; Falloppia: *De medicatis aquis*, 1556, Padua; Bacci: *De Thermis*, 1571, Venice; Minardo: a short description of the baths of Caldiero, 1594, Verona (Palmer, 1990).

In Central Europe, the therapeutic value and the social character of the public baths became again combined, men and women could bath together (Adler, 1993). At the hot springs, patients both drank and took a bath; at the cold springs they only drank the waters. Generally, a treatment was supervised by a doctor (Frosh, 2007). In France and Germany some spas became renowned because of healing a specific problem. In Forges nephritic problems and infertility were treated, while in Vichy and Bourbon the paralytic and apopleptic diseases (Frosh, 2007).

The reason why spas started to deteriorate again was the unisex usage that resulted in a general impurity and the spread of venereal diseases (Adler, 1993). The Encyclopedia of the Middle Ages also mentions the bath houses as places of prostitution (Vauchez et al., 2000). They were considered to be a source of contagious diseases such as syphilis, plague, and leprosy which led to the closure of many public baths at the end of the 16th century (van Tubergen&van der Linden, 2002 from Looman, 1989; Porter, 1990 from Vigarello, 1985, Courtier, 1992).

A positive turn in the development of spas began in the 17th century again. Places like Montecatini, Lucca (Italy), Varna (Bulgaria) were already known (Routh et al., 1996). In France, Vichy, Forges and Bourbon-Lucy were discovered (Brockliss, 1990), as well as Bath, Epsom and Tunbridge Wells in the UK (Routh et al., 1996), Carlsbad, Ems, Marienbad in Germany, Spa in Belgium (Coley, 1990). The first private spa institute in Belgium was founded in 1764 and the first public one in 1820.

Much attention was paid to treatments: purification, drinking cures, eating well balanced diets, and bathing (van Tubergen&van der Linden, 2002). In France the hot springs were used for bathing and drinking, the cold spring water for imbibing it (Brockliss, 1990).

Competition between various spas stimulated the chemical analysis of the various mineral waters. Boyle was the first who made a serious scientific study of the components of waters in England followed by Hoffmann from Saxony (Ford, 1984). Hoffmann, by using the work of Boyle, made a study of mineral water analysis in 1703 and Short made the systematization of the mineral water analysis in 1734 (Coley, 1990). The first legal steps in Central Europe concerning the health resorts were taken by Empress Maria Theresa since 1763. To become more acquainted with the healing places, she asked for the inventory of spas and mineral waters in the Austrian Empire (Bozikova, 2009).

Struggles made for the analysis of mineral waters had three reasons: (1) to prove their therapeutic effects, (2) to promote the spas and attract patients, (3) to be able to prepare mixtures similar to those waters known for their curative effects. Most authors who wrote on the subject in the 18th and early 19th centuries were doctors practicing medicine at one of the spas (Coley, 1990).

By the 1790's Joseph Priestly and others started preparing artificial mineral waters (Frosch, 2007). In 1780, Jacob Schweppe founded in Geneva one of the best known artificial mineral water companies that was moved after several years to London (Simmons, 1983; Back et al., 1995).

The idea of going to spas changed during the 19th century, when the curative effects of the waters started to play a secondary role. The spa-going public used to choose a location just because it was fashionable. Spa doctors and treatments were also a factor that made a place fashionable (Blackbourn, 2002). Arthritic, digestive, respiratory, dermatological, circulatory, and nervous problems were treated at these health resorts, mostly through bathing and drinking cures. Applications, like showers directed at specific body parts, mud baths, and inhalation of vapors of water were also practiced (Weisz, 2001).

The 19th century fashionable spas offered a luxurious life style in a natural environment, and became important meeting places. Theatres, reading rooms, shops, coffee houses were part of the health resort. European political elites could be found there mostly before military actions (Blackbourn, 2002). Spas were also a place of creativity

for painters, writers and composers (van Tubergen&van der Linden, 2002). Many great spas, like Marienbad, Bad Ems, Bad Homburg, Bad Kissingen were actually new establishments at the beginning of the 1800's (Blackbourn, 2002).

The rivalry among the famous health resorts made them put in new investments and enlarge the supply of services and leisure activities. First, auxiliary treatments were included, like massages, then hotels, restaurants, casinos (Weisz, 2001), followed by the singposting of paths in the surrounding countryside (Blackbourn, 2002). Estimations made for the 1830's show that about 30,000 French people took water cures, while by the end of the century this number was around 300,000 (Weisz, 2001).

Despite all the investments, a short decline was noticed during the Napoleonic wars. The mobility opportunities were limited and the number of international guests decreased at the European spas (Blackbourn, 2002).

During the 19th century, the Academy of Medicine in France played an important role in the administrative and scientific supervision of mineral waters (Weisz, 2001). In 1894 Albert Robin organized French spa doctors into a professional trade union group, and founded the *Syndicat des Mediciens des Stations Balneaires et Climatiques* (Weisz, 2001).

Before the railway lines were constructed, many spas were difficult to reach, because of their mountainous location. Travelling became easier in the second part of the 19th century and the number of spa visitors increased greatly (Blackbourn, 2002). Travelling by train, middle class people could also afford the visits at spas. In Germany there was a powerful middle class support. The majority of the 300 German spas operating at the end of the 19th century resembled Bad Berka in Thuringia or one of the solidly middle-class spas in the Black Forest. These more modest spas emphasized their 'comfortable', 'intimate' and 'family' character as retreats (Blackbourn, 2002).

After gambling was prohibited, German spas invested in bottled water sales. By the late 19th century, Bad Ems, Schlangenbad and Schwalbach were selling millions of liters a year worldwide. After that, the most successful ones (Vichy, Bad Ems, Carlsbad) managed to make their name internationally synonymous with their product (Blackbourn, 2002).

The spa-going trend could be seen also in other parts of Europe, like Poland - Cieplice Spa, Ladek Spa and Duszniki Spa, Ciechocinek and Konstancin, Krynica and Szczawnica, Iwonicz Spa (Kepinska, 2002), Slovakia - Trencianske Teplice, Piestany, Turcianske Teplice, Sliac, BardejovskeKupele, Rajecke Teplice, Vysne Ruzbachy (Bozikova, 2009), Austria - Bad Ischl, Sauerbrunn, Ultental, Ratzesberg (Steward, 2002), Hungary - Budapest, Hévíz, Balatonfüred, Miskolctapolca, Eger, Harkány, Balfi Spa and others (Török, 1848), Transylvania - Herkules Spa, Algyógy, Felix Spa, Borszék, Szejke Spa, Szeltersz Spa, Kiruj Spa, Uzonka Spa, Tusnádfürdő, Bálványos Spa, Kovászna (Török, 1848), Bulgaria - Sapareva Banja, Sandanski, Velingrad, Hisarja (Bojadgieva et al., 2002) reaching their best periods in the second half of the 19th century.

At the beginning of the 20th century, spas had to face the attractive opportunities of the seaside and the changes caused by the First World War (Blackbourn, 2002). Besides the cold and hot mineral waters, the thalassotherapy started to be used too (Cohen & Bodeker, 2008, chapter 2).

It is interesting that the popularity of French spas grew during the interwar period. There are estimates of spa visitors that show a number of around 500,000 people, including significant numbers of foreigners in 1938 (Weisz, 2001).

After the Second World War, in many European countries spa treatment became available for common people with the help of the state medical systems (van Tubergen & van der Linden, 2002 from Coutier, 1992 and Looman, 1989).

In the first part of the 20th century the traditional way of treating with mineral waters declined and disappeared from the spa practices in the English-speaking regions (Porter, 1990). In a way this can be explained by the inadequate management of the medical hydrology (Harley, 1990; Cantor, 1990; van Tubergen & van der Linden, 2002), the appearance of new drugs and therapies in the medical sector (Weisz, 2001) and the influence of the American spa ideas. Those centers that were considered economically powerful got the support from the authorities. Where this was not the case, the health resorts went to ruin (Weisz, 2001).

4. WELLNESS INSTEAD OF TREATMENT AT THE AMERICAN SPAS

European spa tradition made colonists to look for similar springs and healing places in America too. Some of these locations were White Sulphur Springs, Saratoga Springs, Arkansas Hot Springs, Calistoga, French Lick, and Desert Hot Springs (Cohen & Bodeker, 2008, chapter 2).

In 1940 the first new-style destination spa was founded in Tecate, Mexico, today very close to the American border. The spa called Rancho la Puerta was established by Deborah and Edmond Székely, had services of fitness and relaxation without traditional treatments with water (Cohen & Bodeker, 2008, chapter 2).

American trends in spa practices have three major influence factors, the conceptions and ideas of (1) Rancho La Puerta in Tecate, Mexico, in the 1940s, (2) The Golden Door in southern California in the 1950s, and (3) Canyon Ranch in Tucson in 1979. These three enterprises have been the models for spa development for the past several decades (Frost, 2004).

Lund (2000b) reported a total number of approximately 210 spas in the USA at the beginning of the 3rd millennium. The majority of today working spas are located in the volcanic regions of the western states. Mineral waters and spas became strong points in the USA in a short time. Geological and hydro-geological research was made to identify new locations for establishing spas and to define the type of the waters (Routh et al., 1996 from Bell, 1885).

With the development of the medicine and pharmaceuticals, the American spas excluded the traditional treatments from their services and gave more importance to relaxation, beauty and fitness (Cohen & Bodeker, 2008, chapter 2).

5. CONTEMPORARY APPRECIATION OF THE SPAS

At the turn of the new millennium, spa practices integrate a range of services that come from a mixture of different cultures: American emphasis on beauty, pampering and destination experiences; Asian service ethics, holistic therapies and spiritual practices; European medical traditions and clinical development (Cohen & Bodeker, 2008, chapter 1).

Since the term "health tourism" was defined by the International Union of Tourism Organizations in 1973, the health and spa tourism developed rapidly (Bielanski et al., 2011). It is reported that spas are the fastest growing leisure industry in the USA that shows a growing rate of 20% per year (Cohen & Bodeker, 2008).

According to the European Spa Association (ESPA), which represents spas in 20 nations, there are more than 1200 spas and health resorts throughout Europe (<http://www.espa-ehv.eu/association/>).

In the most developed countries of Europe, like the Scandinavian countries, the Netherlands, Germany, treatments made at a spa are covered financially by the government social health policy (Frost, 2004). In those European countries, where the government has reduced or cut the financial support of the spa visitors in the 1990s, the number of patients has also reduced (Cohen & Bodeker, 2008).

The most dynamic growth in the spa industry can be identified in Asia. A big difference can be observed between the Eastern and Western spa services. While in Western Europe and USA we find aesthetics and treatments with hi-tech surroundings, in the East visitors are in a more “high-touch and low-tech” neighborhood, rich cultural and natural heritage with lower costs that could explain the above mentioned trend (Cohen & Bodeker, 2008).

In 1986 the SpaFinder was established because of the strong demand for spa practices. This agency, specialized in spa vacations, became one of the world’s largest spa information and marketing company that can be reached at the following website: www.spafinder.com (Cohen & Bodeker, 2008, chapter 2).

In 1991, the International Spa Association (ISPA) was founded. It collects statistics and information about the spa industry. ISPA introduced a code of ethics and established standards for safety, guest relations and services (Cohen & Bodeker, 2008). Apart from ISPA and ESPA, each country has its own regulations concerning spas and health resorts and the use of mineral waters (Kepinska, 2002).

Spa resorts are differentiated according to their location – for example seaside or mountain area, the chemical composition of their mineral water – for example sulphurous, bicarbonate, and so on (van Tubergen & van der Linden, 2002), and the mineralization and temperature of the waters (Matz et al., 2003).

Nowadays a good tweak is, that hotels and resorts are adding the words “and spa” to their names that help differentiate them from the competition. Also, new trends appeared, like treatments especially for men customers, couple treatments, to group of friends, mothers with babies (Cohen & Bodeker, 2008).

In our era the water cures in mineral and medicinal waters are again accepted or acknowledged especially by many rheumatologists and dermatologists (van Tubergen & van der Linden, 2002). The popularity of the spas has flourished because of the growing depersonalization of the modern health care system and the greater emphasis on wellness and preventive medicine (Katz & McBean, 2008).

6. FINAL REMARKS

The usage of mineral and thermal waters for healing started to develop as a serious branch of the medicine with the opportunities of the specific era. Heydays and declines came one after the other. Declines were usually caused by the unisex characteristics, by immoral behavior, heydays started usually thanks to the return to the healing effects of the waters that resulted in more and more sophisticated medical practices. Deflections from this trend can be observed in the 19th century with the rivalry of some establishments, when the business ambitions started to spread over. Low attention

was paid to traditional balneology, additional services like beauty and relaxation practices, recreation, social activities were the strong points of a health resort. As drug treatments of some diseases did not turn out a success in all cases, people have started to return to the natural healing methods. This new trend can be observed mostly in dermatology and rheumatology.

We would like to support the idea of Gutenbrunner et al. (2010), the need for the terms “spa” and “health resort”, “balneology” and “hydrotherapy” to be clarified, medical and beauty services to be distinguished in this field. Everyday people should not be left tangled by marketing strategies.

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THERAPEUTIC AND TOURISM RECOVERY OF MICROCLIMATE FROM PRAID AND TURDA SALT MINES

CAMELIA BIANCA TOMA¹, I.A. IRIMUȘ¹

ABSTRACT. – Therapeutic and Tourism Recovery of Microclimate from Praid and Turda Salt Mines. Saliferous area Praid – Sovata – Corund is situated on the contact area of the Transylvanian Basin with neo-eruptive mountain chain of Eastern Carpathians, Calimani – Gurghiu – Harghita, and at the contact of Târnave Plateau with the orogenic alignment of Gurghiu – Harghita Mountains. The beginnings of salt exploitation in Praid dates back to the Roman era. Underground salt exploitation began in 1762, in the south-west of Salt Hill, and continues today.

The salt massif from Turda develops on the anticline Sic –Cojocna – Turda, oriented NE – SW, 2 km NE of Turda downtown. Archaeological evidence of the salt exploitation from Durgau-Turda, exist since the pre-Roman period (50 BC-106 AD). Other documents proving the exploitation in Turda date since the sixteenth and seventeenth centuries, during the Hungarian and Austrian dominions. Exploitation continued until 1932, when they were stopped because of primitive technical equipment, low efficiency and competition from other Transylvanian salt mines.

The holes resulting from exploitation were arranged and turned into treatment rooms for those affected by respiratory diseases.

The underground treatment from Praid salt mine, started by the 1960s in Doja mine, and in 1992 at Turda Salt Mine. These underground treatments are possible due to the microclimate which was formed in the salt mines.

Keywords: *microclimate, salt, Praid, Turda, treatment.*

1. INTRODUCTION

Recognition and therapeutic use of the saline microclimate, especially in recent decades, started from a series of observations, from early nineteenth century, namely: absence of disease of chronic bronchitis and asthma to the miners of salt mines in Wieliczka (Poland), and fast healing of the disease to new employees, improvement to the disappearance of asthma in asthmatic patients, refugees during the two world wars, in Kluttert cave (Germany) developed in salt, used as shelter during the bombing (***, 1989). Therefore, treatment of respiratory diseases within the salt mines, is now recognized as effective and with reliable results to improve, statistically interpreted in the whole world.

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In Romania this type of treatment is successfully practiced, in several mines, which have stopped or still continue the production. The speleo-therapeutic potential of Romania is one of the most well represented in Europe. Such mines are: Tg. Ocna, Slanic Prahova, Praid, Ocna Dej, Cacica, Turda, but we will focus only on the exploitation of Praid and Turda microclimate. The microclimate measurements were made by the Institute of Physical Medicine, Rehabilitation and Medical Balneoclimatology.

2. SALT SITES DESCRIPTION AND BRIEF HISTORY OF THEIR EXPLOITATION

2. 1. Praid salt ore

Praid-Sovata-Corund saliferous area belongs to Praid-Sovata diapir anticline, located in the eastern diapir area of the Transylvanian Basin, at the contact with neoruptive mountain chain of Eastern Carpathians, Calimani-Gurghiu-Harghita, and at the contact of Târnavă Plateau with the orogen alignment of Gurghiu-Harghita Mountains.

Praid Basin include "Salt Hill" diapir structure, with development in the localities Praid, Ocna de Sus and Ocna de Jos. The salt massif presents, in its surface morphology, a triangular shape, whose top, in a southerly direction, is directed to Corund village, and in North and West it merges with Sovata Basin. Salt Hill, or "Back Salt", as locals call it, has a nipple shaped, quasi-circular, and hides in his basement, the salt diapir massive, and has a maximum altitude of 571.8 m (Horvath, I., 2009).

The salt body, in the horizontal plane, has a quasi-circular shape, slightly ellipsoidal, with diameters of 1.2 and 1.4 km, and is estimated to have a burial depth of 2.6 to 2.8 km. The salt massif from Praid pierce the Mio-Pliocene blanket around and appears at the surface as diapir. This deposit belongs to the most representative salt diapirs from Europe. The volume of salt rock stuck in this diapir massif could provide the necessary of salt, of the European continent, for several hundred years (Irimus, I.A., 2006).

Praid deposit has been exploited, with interruptions, from Roman times. The first document of salt exploitation in Praid, is from 1405, the time of Sigismund of Luxembourg. During that time, the work was made only in winter time: from November 15 till April 15. Joseph mine was opened in 1762, under the Austrian specialist Aladár Frenzl, and was exploited to a depth of 55m, with ogival profile (bell mine). In the literature, the first references to the opening of the mines are those of Johann Fichtel (1780). The salt pits from Praid pass into the Vienna Royal Court property, starting with 1787, when the organized exploitation actually began. The operation of Paralela Mine begins in 1864, with trapezoidal profile, which in the end (1949) reached a depth of 90.9 m. A series of galleries and small research rooms have been executed from 1989 to identify new areas of operation. Elizabeth Gallery was made after the execution of these small rooms and galleries, and crossed the salt mountain on North-South direction, and it was used, for a long time, to drain the infiltration rain water.

G. Dozsa Mine opened between 1949 - 1950, keeping a pillar of 40 m width, away from Paralela mine. In G. Dozsa mine, three large trapezoidal rooms were operated

having the final height of 70.2 m, and a series of rooms including under the two old mines: Joseph and Paralela.

The salt rock, today, is operated under the old mines, to which was kept a safety floor of 40 m thickness, with small rooms and long rectangular pillars, in the bunk down system (the lower horizons). The salt exploitation is held, also (since 1994) in the north-east of the deposit - Telegdy mining sector – where the small rooms and square pillars method is used (Canadian way) (Horvath, I., 2001).

2. 2. Turda salt ore

Turda salt ore develops on the anticline Sic-Cojocna-Turda, oriented North-East – South-West, 2 km North-East of Turda downtown. The salt body has an elongated shape, about 4 km long, with widths ranging from 700 m to 200 m and also with a thickness ranging from 750 m to over 1000 m. Turda deposit is more complex because it basically consists of two salt massifs, which are in the eastern part of town. The first massif is situated in the Salt Valley and has a lenticular shape and the second one is in the Roman Baths area and has an ellipsoidal shape. Both massifs are united in Dumbrava synclinal area, and together form a salt deposit estimated at 38 billion tons. The salt deposit, in terms of stratigraphy, is surrounded by deposits belonging to Badenian, Sarmatian and Quaternary (Nicoleta Brişan, 2004).

Archaeological evidence of the salt exploitation from Durgau-Turda, exist since the pre-Roman period (50 BC-106 AD), and the Romans (106-274 AD) have exploited the salt from Durgau, in pyramid rooms 17-34 m deep and 10-12 m wide, but the first document that tells about the existence of a salt exploitation in Turda, is issued by the Hungarian Chancellery on the 1st of May 1271.

From existing documents dating from XIII - XVI centuries, it is shown that the salt exploitation in Turda, in that period, was located on the current location of the salt lakes, at the Salt Baths micro-basin and the South-East slope of the Salt Valley. The opening works of the "Terezia" Mine are initiated in 1960, and in short time, the "St. Anton" mine also opened, an area where the mining activity continues until the first half of the twentieth century (Mera,O., Stefanie, T., Vişinescu, V., 2010).

At the beginning, Turda Salt Mine was one of the most important mines in Transylvania, but after 1840 it started to decline due to increased competition of Ocna Mures. The construction of "Franz Joseph" gallery was completed in 1870, and was designed to facilitate the salt transport, with a length of 780 m, being extended, until the end of the century, with 137 m. The salt exploitation in "Anton" pit was abandoned in 1862, because of the presence of massive amounts of sterile inside the extracted salt, and in 1864 they started to modernize and completing the "Teresa" pit with two side rooms, "Rudolf" and "Ghizela". Exploitation continued until 1932, when it was stopped because of primitive technical equipment, low efficiency and competition from other Transylvanian salt mines (Irimuş, I. A., 2006).

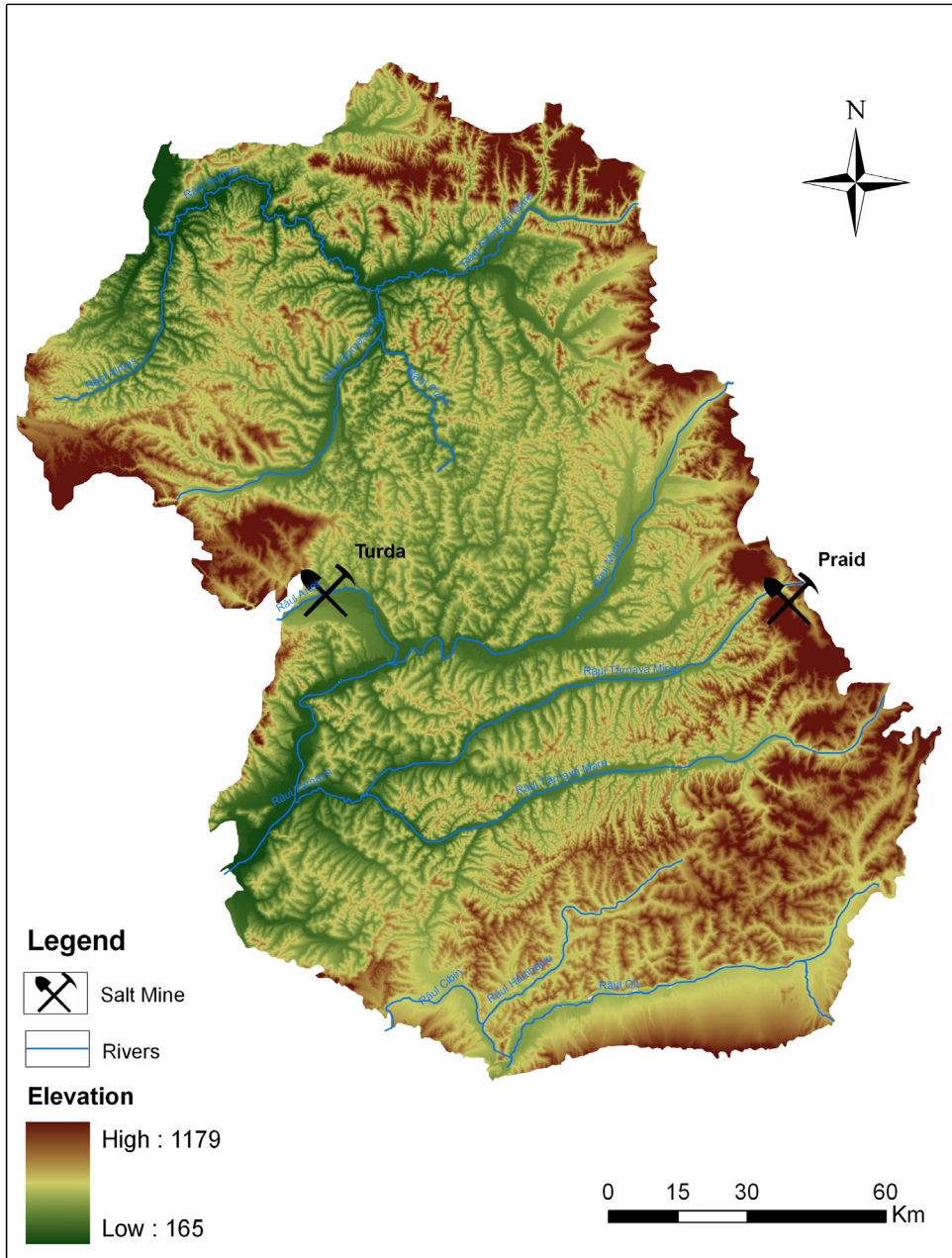


Fig. 1. The location of Praid and Turda salt mines.

3. FEATURES OF PRAID AND TURDA MICROCLIMATES

3. 1. The microclimate from Praid Salt Mine and its recovery

The microclimate from Praid Salt Mine is distinguished by the following features:

- *High degree of air purity (sterility)*, because in Praid Salt Mine the number of germs varies between 180-270 pieces/cm³. Here some certain mycological types (Mycromicetes) are present also, some of which are used to produce antibiotics (eg. like Penicillium);

- *The air temperature is constant*. In Praid Salt Mine, during cold times, temperature is 15.4 to 16.4 °C, and during summer is 15.8 °C, so maximum variation is only 0.2 °C. The rock temperature is between 15.4 to 16.4 °C. The determining factor is not only the temperature but rather her constant character;

- *Secondary action of relatively low temperature*. Relatively cold air, from galleries and mine rooms, like cold aerosols has a stimulating action on the "cough receptors" in the body;

- *Relatively high air humidity (vapor content)*. In the current treatment rooms, relative vapor content is 71% (70% at the hall entrance), which is maintained at all times of the seasons, in this way providing a constantly fluid environment, regardless of outside conditions;

- *Favorable content of vapor condensation*. Inside Praid mine air, microscopic salt particles, in suspension have a healing effect. These crystal particles of sodium chloride (NaCl), with sizes below 5 microns (50% of them), during the inspiration, enter the lungs down to the alveolar level. Beside Ca₂₊ ions, dominant in the saline air, other aerosols are present in the rich sulphate, nitrates, ammonium, Mg, K, Na, I and Brom ions. They float through microscopic drops of water and thus complete the therapeutic effect of Ca and Na particles;

- *Low speed of air currents*. Section of the treatment and visiting rooms from Praid, varies between values of 240-250 m², so because of these dimensions, the human body can not see air currents, so there is no feeling of cold. Air velocity measured in the salt mine is 0.2 to 0.3 m/sec. and is independent of outside weather conditions;

- *The high content of carbon dioxide in the air*. In the air of Praid Salt Mine, the CO₂ content varies between 611-799 mg/m³, which increased the inspired air with 1.0 to 1.5 l/min, thus accelerating lung ventilation;

- *Large negative ionizers (high number microns)*. At Praid, the ionizer level varies between 413-580 ion/m³, weight of negative ions is slightly positive in summer (natural radioactivity in saline air expressed in Ra 222 is 1.5 to 1.9 x10⁻¹³ Curie/liter, which is 2-3 times higher than in the atmosphere from surface);

- *Very low ozone in the air*. The lack of ozone (O₃ +) in the saline air, in medical terms of means higher purity, reduces smooth muscle convulsions. Low concentration of reducing material is inversely proportional to the degree of air purity;

- *The air pH is low (acidic character)*. Low pH of saline air (at Praid is between 6.5 to 6.9), contribute to air disinfection and reduce bacterial flora;

- *Partial pressure of oxygen is high.* In Praid Salt Mine underground, the pressure is 734 mm Hgm/m in October, and 726 Hgm /m in June, so it is directly related to the pressure variation from the surface (Armaş I., Demian R., Verga M., Horvath I., 2004).

Given the peculiarities of Praid Salt Mine microclimate, one can state its therapeutic value for treating respiratory diseases.

In Praid Salt Mine, the underground treatment started by 1960s in Doja mine. Speleotherapy and climatic-therapy treatment, includes practically, inhaling the air from the mine, being useful for respiratory diseases (diseases as asthma, bronchitis and allergy). Treatment duration is 18 days, for adults, and 10-12 days for children, 4 hours per day spent in the salt mine. During the time spent in underground, gymnastics led by a specialist is also recommended, as well as walks and dosage exercise. Age category people that can be treated is between 2 and 60 years and they are constantly monitored by medical staff. In the treatment base, both patients with respiratory diseases and tourists who visit the exploitation rooms from Praid Salt Mine have access. Aerosol treatment of patients is done under constant supervision of medical staff. In summer season, an average of 1500 patients and from 1000 to 1500 visitors enter daily in the treatment base. In other periods, the number of patients and visitors is much less, about 100 to 300 daily.

In 1980, treatment was displaced to horizon "50", which is at a depth of 120 m from surface. This space contains operating rooms no. 657, 656 / A, 655, 653, 654, 651 and 652, a total area of 9400 sqm with a 20 m width and 14m height. Access to underground is made by bus through a coast gallery, on an incline, 1250 m long within mine. The treatment base is served by six medical staff and are arranged some first aid room, and for babies are arranged two houses, where you can change diapers and feed. For entertainment, some arrangements were made inside the mine: it was built a church (fig. 2), a playground for children with wooden toys, a gym space (fig. 3), a museum (fig. 4), a restaurant (fig. 5), a tennis table and a small library and gifts hops. The entire surface of mine has internet access (Horvath, I., 2004, 2009).

The number of people who seek this treatment is increasing and is characterized by annual return of the patients with a maximum in summer.



Fig. 2. The church from Praid Salt Mine.



Fig. 3. The gym from Praid Salt Mine.



Fig. 4. The Museum in Praid Salt Mine.



Fig. 5. The Restaurant in Praid Salt Mine.

3. 2. The microclimate of Turda Salt Mine and its recovery

The microclimate from Turda Salt Mine is distinguished by the following features:

- *The air temperature* in the cold season is between 7.2 ° C and 9.3 ° C. During summer, the temperature is between 9.2 and 10 ° C, 2 ° C. So, the temperatures are slightly higher than in winter, the difference between the average values of the temperature in the winter (9.3 ° C) and the values in the summer (10.2 ° C) is less than 1 ° C, which shows, the thermal invariation of the microclimate from one season to another;

- *Relative air humidity* ranged from 60-76% in winter season (average 67.5%) and 72-80% in the warm season (average 75.8%), in both cases being higher than outside. Differences between observation points are more evident in winter, in summer, values are more homogeneous;

- *Air currents speed* is reduced in the salt mine, is more obvious near the vents and openings for entry. Thus, in winter, values range from 0.3 to 0.4 m/s. For summer are observed differences between rooms, in the way that, the new opening, raises the velocity currents in small rooms up to 0.16 m/s, while, in Rudolf mine is maintaining a null velocity;

- *The pressure* is 1.2 mm lower to the upper level of the mine from outside, and 5-6 mm higher at the floor level of Rudolf mine from the upper corridor, reported to a altitude difference of about 60 m;

- *Thermal comfort index* expressed by equivalent effective temperature, namely, effective temperature felt by humans, based on actual temperature, humidity and air currents rate, indicating values from 7.1 to 10.4 ° TEE in the cold semester, and 9.1 to 11 ° TEE in the warm semester. These intervals, encircle Turda Salt Mine microclimate within the category of discomfort by cooling, showing a moderate cooling index;

- *Pulmonary stress* calculated on the values of water vapor pressure, size ranging between 5.6 and 7.6 mb, shows a slightly dehydrated character in all rooms inside the saline, and a balanced character in entry areas, at the vents;

- *Concentration of aerosols* particles varies between 130-250/cm³ with a rate of 80-95% particles below 3 mm, so with access to the pulmonary alveoli;

- CO_2 concentrations ranged from 724-840 mg/m^3 , the minimum in the upper side of Rudolf mine, and maximum in table room;
- Nitrogen dioxide concentration is in all cases well below the standard of 10 mg/m^3 ;
- Air pH is around neutral point, slightly basic, indicating the absence of mineral acids in the air inside the mine (***, 1989; Mera, O., 2010).

A new company to manage and exploit tourism and therapeutic potential of old salt mine from Turda, was founded at the end of 1991, following discussions between representatives of Tourism Aries, SA Turda and Transgex S.A. Cluj companies, with those of Turda City Hall. Turda Salt Mine was open to the public in April 1992, after some small design.

Turda Salt Mine was closed in 2008 for an extensive modernization process in a PHARE 2005 project, and opened for tourists in January 2010. The salt mine is now equipped with the new treatment rooms, and the old operating rooms received a new look and enhanced functionality. Thus, in Rudolf Mine (fig. 6) rearrangements were made in order to have a concert hall, a sports field, a bowling, a minigolf (fig. 7) but also a huge gondola and an elevator. Also, on the lake from Theresa Mine (fig. 8) a dock with boats was built (fig. 9). Overall, Turda salt mine appearance has changed radically.



Fig. 6. Rudolf Mine, Turda Salt Mine.



Fig. 7. Minigolf in Turda Salt Mine.



Fig. 8. Terezia Mine, Turda Salt Mine.



Fig. 9. Dock with boats, the Theresa Mine, Turda Salt Mine.

4. CONCLUSIONS

Results obtained in all these years, increasing number of patients and tourists, is a guarantee that these salt mines can be used with good results for therapeutic purposes.

Favorable results of therapeutic treatments, obtained during this time, 17 years of activity in Turda Salt Mine, and 52 years of activity in Praid Salt Mine, are attributed to these specific conditions observed in these places: constant air temperature, relative air humidity, salt aerosols presence in the form of solid particles, and the lack of air- pollutants and pathogen germs.

Saline microclimates are similar, but there are some differences: air temperature, which in Praid Salt Mine is higher than in Turda Salt Mine with 4-5 degrees; temperature variation from winter to summer, in Praid Salt Mine the difference is only 0.2 °C, while in Turda Salt Mine it is 1 °C; and relative air humidity, which in Praid Salt Mine is constant, but in Turda Salt Mine it presents certain differences between winter and summer.

Thanks to these beneficial actions of microclimates on the human body, the number of patients and especially that of tourists is increasing every year, reaching mines reputation abroad. In Turda Salt Mine, the number of patients together with the number of visitors reached 64 000 in 2008, and in Praid Salt Mine, in the same year, the number of patients with that of tourists was 430 000.

It must be remembered that there are just a few therapeutic bases like these, in Transylvania, and is a good idea to use them for therapeutic and tourist purposes.

Improvement of these two mines, which are the most important in Transylvania, as an underground sanatorium, is an important objective, which allows full exploitation of the natural factors of the areas.

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A NEW TREND IN THE HOTEL INDUSTRY: ECOLOGES

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ABSTRACT. – A New Trend in the Hotel Industry: Ecolodges. The change phenomenon is deeply affecting the business world as well as all other fields in social life. One of the fields being affected from the change is the tourism and hotel establishments, which are its basic components. Today, while tourism rapidly continues to develop all around the world, on the other hand, one can see that different hotel concepts are created in parallel to new travelling tendencies. In recent years, since the tendencies particularly for environmental friendly practices have gradually developed, an accommodation concept called “eco-hotels” or “ecolodge” or “green hotel” has occurred. In this study, the importance of ecolodges which are one of the newest trends in hotel industry, is being discussed. Today, ecolodges are one of the first choices for hotel investments in many destinations. In this study, the samples presented are quite interesting and it is anticipated that with its such aspect, it will be quite beneficial to hotel investors and hotel managers.

Keywords: *changing, tourism, hotel establishments, environmental-friendship practices, ecolodges.*

1. INTRODUCTION

A rapidly changing business environment, changing customer demands, and increasing competition has been a challenge for many of today's hospitality companies (Cho et al., 2006). The gradual rising in the importance of tourism for countries' economies have led to an increase in the number of tourism establishment nowadays, and strengthened the competition environment. As for all the establishments, one of the main reasons for the hotels is obviously to stay competitive as well. The way for that is to make the hotel more attractive than the competitors (Didin and Köroğlu, 2008). Ecolodges are accepted as one of the new trends in the hotel industry in recent years. An important part is that the travellers usually live in the industrialized metropolitan areas. Problems in big cities such as noise, environmental pollution, traffic and overpopulation are increasing the people's longing for the nature. Ecolodges offer their environmentally aware customers a holiday alone with nature, and thus gain an important competitive advantage. Moreover, ecolodges adopt an environmental friendly approach and considerably serve for the sustainable tourism efforts.

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The tendency for environmental friendly practices is not only a peculiar concern to tourism, but also to all industries in the world. Particularly, the establishments in all the industries which play a role in environmental problems such as climate changing and global warming are seeking solutions about reducing such negative effects. The problems such as pollution of the seas, melting glaciers and ozone depletion are tried to be minimized by the studies of international environmental friendly organizations, non governmental organizations and scientists. In this context, the "environmental sensitive" concept gradually began to gain importance by the effects of individuals and organizations that behave in a sensitive way for the environment (Gül, 2011: 46). Today, we can abundantly notice that in the hotel industry as well. Rada (1996 adapted from Bohdanowicz et al., 2005: 1643) states that due to high level of resource utilization (energy, water, consumables) in hotel facilities, the environmental footprint of hotels is typically larger than those of other types of buildings of similar size. In this context, Holjevac (2003) suggests that the hotel of the future will be a "green hotel" or an "eco-hotel". Everything, from the choice of the location, construction, equipment, hotel products and hotel services, will be subordinated to the preservation of nature and the environment, to man – the worker, and man – the guest. Nature hotels or "eco-oasis" will be a common phenomenon. Likewise, Leonidas (2004) asserts that the sustainable and environmentalist design in hotels are the criteria which are increasingly demanded by the customers, and states that eco-resorts are new hotel concepts. Hotels have numerous motivations for going green including: a feeling of social responsibility, governmental regulations, and economic benefits (Cometa, 2012: 1 adapted from Bohdanowicz, 2006).

In this study, the importance of ecolodges which are recently one of the newest trends in hotel industry, is being discussed. The study consists of two parts. In the first part, the eco hotel concept and its basic features are explained. The second part includes the samples related to ecolodges in the world. And in the last part of the study, there are some suggestions for the investors who want to make investments in the hotel management field.

2. A NEW PHENOMENON IN TOURISM: ECOLODGES

The term "ecolodge" was formally launched on the market at the First International Ecolodge Forum and Field Seminar held in 1994 at Maho Bay Camps in the U.S. Virgin Islands (Wood, 2002: 27; Mehta, 2007: 418; Dizdarević, 2010: 26) and Maho Bay Camps was determined as the first ecolodge (Mehta, 2007: 418). As a follow-up of the 1994 forum, TIES published the first book for ecolodge industry named "The Ecolodge Sourcebook for Planners and Developers" (Mehta, 2007: 417) which contains information on site selection, finance, planning, design, alternative energy applications, conservation education, guidelines and an impressive set of resources including a variety of architectural plans for ecolodges (Eagles, 2001: 615). Later, "The First International Ecolodge Guidelines" was published in 2002 after the Second International Conference held in 1995 in Costa Rica, which offered a definitive international definition of an ecolodge (Wood, 2002: 27; Mehta, 2007: 418). According to the definition, ecolodge is "an industry label used to identify a nature-dependent tourist lodge that meets the philosophy and principles of ecotourism" (Weaver, 2001: 147; Fennell, 2003: 169; Mehta, 2007: 418; Ceballos-Lascurain, 2008: 197; Kwan et al., 2008: 698; Raju, 2009: 47). Mehta et al. (2002) enriched the definition by utilizing existing one and the following definition was proposed (Mehta, 2007: 418):

"An ecolodge is a five- to 75- room, low-impact, nature-based, financially sustainable accommodation facility that helps protect sensitive neighbouring areas; involves and benefits local communities; offers tourists an interpretive and interactive participatory experience; provides a spiritual communion with nature and culture; and is planned, designed, constructed and operated in an environmentally and socially sensitive manner".

Ecolodges are usually small-scale, individually and locally owned businesses (Moscardo et al., 1996: 32; Wood, 2002: 36; Kwan et al., 2010: 4), rather than being part of a chain. However, there are also a number of outbound tour operators, which have ecolodge chains. For example Abercrombie & Kent Hotels and Resorts, a transnational hotel chain, is corporating with The Nature Conservancy to develop an ecolodge chain in Belize, Brazil and Peru (Honey, 1999: 67; Weaver, 2001: 150). For example, Russell et al. (1995) undertook an international ecolodges survey of 28 operators in nine regions around the world (Belize, Costa Rica, Peru, Brazil, and Ecuador, the state of Alaska, Australia, New Zealand and Africa). This study discovered that many of the lodges were found in or adjacent to protected areas, with outstanding natural beauty acting as a key to success of the operation. Most of the ecolodges sampled were small, accommodating about 24 guests, with some successful operations in Amazonia catering up to 100 guests. Although most of the ownership had been typically small scale and independent, corporate ownership was becoming more common. The authors cited the P&O line in Australia and the Hilton in Kenya as two examples of this recent phenomenon (Fennell, 2003: 173; Raju, 2009: 52).

According to The International Ecolodge Guidelines, an ecolodge should meet the following criteria, which are the key principles of ecolodges (Bien, 2002: 140; Wood, 2002: 28; International Finance Corporation, 2004: 28; Mehta, 2007: 419; Dizdarević, 2010: 27):

- Conserve the surrounding environment, both natural and cultural.
- Have minimal impact on the natural surroundings during construction.
- Fit into its specific physical and cultural contexts through careful attention to form, landscaping and color, as well as the use of localized architecture.
- Use alternative, sustainable means of water acquisition and reduces water consumption.
- Provide careful handling and disposal of solid waste and sewage.
- Meet its energy needs through passive design and combines these with their modern counterparts for greater sustainability.
- Endeavor to work together with the local community.
- Offer interpretative programs to educate both its employees and tourists about the surroundings natural and cultural environments.
- Contribute to sustainable local development through research programs.

Bricker et al. (2004) did a study for determining the location of ecolodges and nature-based lodges in countries. The 60 countries were chosen based on their high concentration of nature-based lodges, their developing (or mature) ecotourism industry, and their location in an area of high biodiversity and/or significant natural attractions. Of the total 5,459 lodges mapped (another 1,059 lodges could not be plotted because no location was available), Indonesia has the largest concentration of lodges (758),

followed by Costa Rica (590), Thailand (468), Peru (356), Ecuador (345), Guatemala (322), Mexico (304), Sri Lanka (277) and Tanzania (259). Of the lodges mapped in all 60 countries, 84 percent are located in biodiversity hotspot areas, as defined by Conservation International. The highest concentration is in Mesoamerica (1,157 lodges), followed by Indo-Burma (543 lodges). Of those ecolodges that completed the in-depth surveys, 60 percent are located within or on the periphery of an established protected area, and 39 percent are located within a private reserve (International Finance Corporation, 2004: 9). Authors marked these ecolodges on the map as seen below:

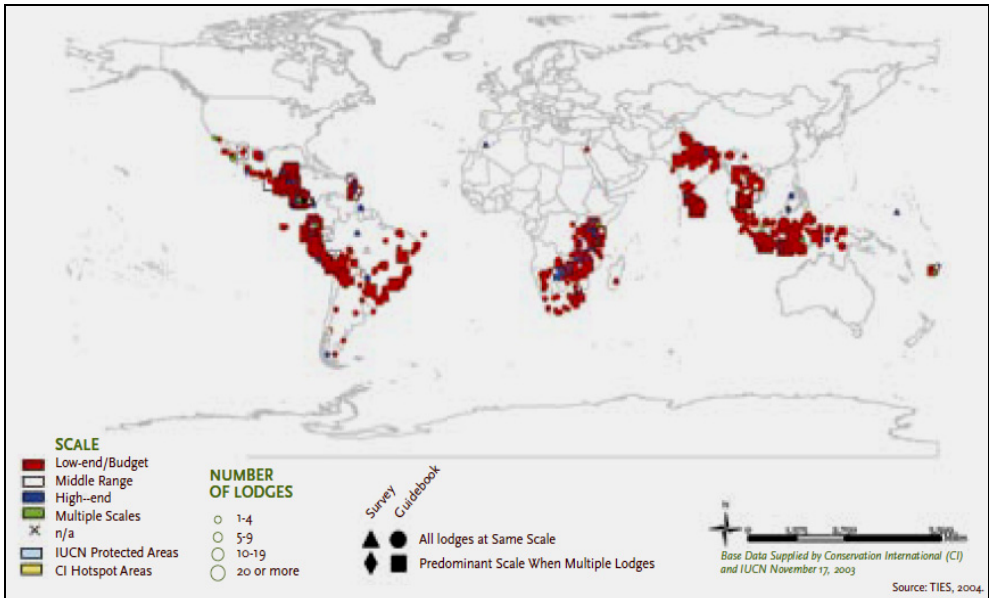


Fig. 1. Ecolodges worldwide

3. EXAMPLES OF ECOLODGES IN THE WORLD

Against all the global warming and environmental pollution which are highly discussed in all fields, hotels are also seen to make efforts for starting to take necessary precautions. The environmental friendly hotels, numbers of which increase day by day, apply various practices to minimize the damage given to the environment. While some of them do not include any electronic appliance within them, some other changes the towels and sheets only if the customer wishes to. And some hotels care about to offer organic food products. Today's travellers mind out that the hotel is environmental friendly as well as with comfort, luxury and design. In this sense, ecolodge models are seen in the tourism industry number of which is growing day by day. Features of some of such hotels may be summarized as in the following (Buckley, 2003; <http://gezz.org/index.php/seyahat/85-seyahat-onerileri/148-dunyanin-en-iyi-eko-sik-otelleri>):

Examples of ecolodges

Table 1

<p>Ngala Lodge and Game Reserve, South Africa (Africa)</p> <p>Glass and cans are recycled in nearby Nelspruit. Catering scraps are used in neighbouring communities for raising pigs. Candle ends are provided for a local village business, which recasts them and sells them back to the Lodge. Sewage is treated in multi-chambered septic-tank systems. Paper and plastic packaging are burnt in an on-site incinerator. The lodge also buys a locally made artisanal paper, manufactured from elephant dung and recycled office paper, for use in the guest rooms.</p>
<p>Rapita Lodge, Solomon Islands (Asia-Pasific)</p> <p>The tourist lodge was constructed by a village working group in the traditional style, using mangrove-pole frames and thatched walls of sago and nipah palms. The resort is run as a cooperative by the Tobakokorapa Association. Members purchase shares in the cooperative in order to receive dividends. The community shares the management responsibilities, providing staff for housekeeping, cleaning and bar and restaurant facilities. Tours are run from the village and include bush-medicine tours and river safaris. A number of young villagers work as guides. Following establishment of the lodge, the village has been able to prevent logging on community land and has banned fishing in several reef areas.</p>
<p>Rara Avis, Costa Rica (South and Central America)</p> <p>Rara Avis sponsors a butterfly-breeding project for export to northernhemisphere zoos; cultivates tree seedlings for reforestation; maintains a live collection of canopy orchids; and supports a range of research and education projects. The main tourist activities are rainforest walks and canopy climbs, principally to watch birds and other wildlife and visit forest pools and waterfalls.</p>
<p>Aurum Lodge, Canada (North America)</p> <p>Aurum Lodge is particularly deserving of the title ecolodge because of its integrated energy-efficient and low-impact environmental design and technologies, and because of its direct involvement in the conservation consequences of other local land-use practices. It has received funding from two relevant Canadian government programmes, the Renewable Energy Deployment Initiative and the Commercial Business Incentive Program. The main building has three storeys, including a partly sunken, full-plan basement which forms an integral part of the building's air circulation and energy management system. Energy-saving design features include; dual insulated walls; overhanging eaves on both upper and lower storeys; windows largely on the southern side; an integrated air circulation system with both passive convective and active ducted-fan components; double-glazed windows; heat exchangers to pre-warm incoming air; and energy-saving appliances. In addition to passive solar heating, there are various energy sources, storage systems and heat exchange mechanisms. There is a cast iron wood stove in the kitchen and a slow-combustion woodstove with a large-mass masonry mount in the main living area.</p>

Daintree Ecolodge, Australia (Australia and New Zealand)
Sewage is treated in a multi-chamber biocycle system located between the villas and the restaurant. Power is supplied from a mains line along the nearby road to Daintree Village. Used kitchen oils are collected and returned for reprocessing.
Whitepod Hotel, Switzerland (Europe)
This hotel, which is located in Switzerland, offers an environmental accommodation facility to winter sports lovers. The hotel consists of nine tents in three different types which are remarkable by their round domes. Recycled materials were used for building the tents, and in order to be ergonomical, white colour was preferred in summer and green in winter. The platforms on which the tents were placed have been designed from sustainable Swiss wood. Therefore the tents are able to be carried to any place easily without damaging the environment. The tents, in which the electricity consumption is minimized, are heated with stoves and illuminated with gasoline lamps. Water consumption is under control by a massive bath located in the main building. All the guests are using the bath in common; sheets and towels are replaced only when the guests want to.

5. CONCLUSIONS

One of the most important factors affecting the success of hotel managements in today's global competitive environment is to be able to create difference. In such an environment, the working of hotel establishments with increasing performance and customer satisfaction level depends on their strategical thinking and to be able to apply them (Seymen, 2001). Eco hotels are accepted as one of the new trends of the tourism in recent years. In an environment where environmental problems are increasing day by day, ecolodges both provide their customers to live a different holiday experience and serve the sustainable tourism efforts at an important level.

Within the frame of this study, suggestions for the entrepreneurs who wish to make investments in hotel management field may be as follows:

- The entrepreneurs who wish to make investments in hotel management field should at first well analyse where the hotel trends are heading towards, who their customers are and in what kind of environment they want to spend their holidays.
- The investors should create common projects with expert architectures, designers and marketing experts in hotel management field, particularly at planning and application levels.
- Close following of the changes in hotel trends by visual and written media and visiting of the international tourism exhibitions by the investors may help to decide what kind of an investment is possible to be made.

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THE TOURISM CAPITALIZATION OF THE HYDROGRAPHIC POTENTIAL IN "MARAMUREȘ LAND" DEPRESSION AREA BY MEANS OF RURAL TOURISM

ALINA SIMONA SIMION¹

ABSTRACT. – **The Tourism Capitalization of the Hydrographic Potential in "Maramureș Land" Depression Area by Means of Rural Tourism.** The rural tourism of Maramureș is a complex activity, with multiple facets. It is not exclusively based on the peasant household, but also on holidays in the middle of nature, motivated by different activities that take place due to a rich natural potential. Out of this attractive natural potential, the hydrographic component was chosen to be analyzed, as it is an important resource, which determined the emergence, development and diversification of tourism in Maramureș Land. This study intends to present the tourism value and importance of the hydrographic resources of Maramureș Land, by means of which rural tourism can be diversified in this geographical area. The hydrography is the main factor influencing the modification of the Maramureș geographic space, the development and characteristics of the settlements, the economic activities performed by the local population. It is also the main factor in directing and orienting the transport network. Maramureș Land hydrographic network has a high variety, from fresh water, to salt water, from rivers with high flows to mineral water springs, being used in diverse manners.

Keywords: *Maramureș Land, hydrographic resources, tourism capitalization, rural tourism, sport tourism.*

1. INTRODUCTION

Rural areas are the framework for a range of tourism activities, specific for many forms of tourism. The built up area of the village with anthropogenic tourism resources is best suited for cultural, religious, recreational and partially for curative tourism. The village surroundings, which encompasses mostly a natural environment, is suited for sport and adventure, recreational, scientific and curative tourism, hunting, caving etc. One can therefore say that rural tourism greatly mingles with other forms of tourism, stimulating and completing each other.

The hydrography of Maramureș Land, through its morphometric characteristics, has an important role to play in the orientation of geographic phenomena. The rivers act as communication and connection lines (the road network can be seen along these rivers), which guide the energy flows and put a distinctive mark on human habitats

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and activities. The underground and surface hydrographic resources of Maramureş Land are an important tourism resource, from a scenic point of view, as well as for recreational and spa treatment purposes.

The river network, with its high density and considerable discharges, is the main factor influencing the mass and energy exchanges between the extreme limits of the Maramureş geographical space. The hydrographic network of Maramureş Land is tributary to Tisa. It is represented by the main collecting rivers Vişeu and Iza, with their tributaries. From the tourism perspective, they are important for sport tourism on some segments, more exactly for canoeing and white water rafting. Alongside the capitalization through active sport activities, the rivers can also be used for sporting activities that require less physical effort, such as fishing.

2. METHODOLOGY OF THE RESEARCH

Starting from the specialized references, which are extensive in the case of rural tourism, and adding the territorial and cartographic analysis, we proposed several possible methods of tourism capitalization for the hydrographic components by means of rural tourism. The cartographic material is intended to complete the written information and to establish a first visual territorial contact of the locations where one can engage in sporting activities, by capitalizing the hydrographic resources. The results obtained in this research, presented below, can act as sources of inspiration for establishing a service offer within the rural tourism of Maramureş.

3. THE CAPITALIZATION OF HYDROGRAPHIC COMPONENTS

The components of the Maramureş Depression hydrography can be capitalized by means of rural tourism, more exactly by specific activities of sport (recreation and adventure), scientific and curative tourism.

3. 1. Sport and recreational tourism

Today, we witness a new shift of the tourism market towards sport tourism, and the hydrographic resources of Maramureş space offer the perfect backdrop for a large range of sporting activities.

White water rafting is part of the adventure sport tourism and is increasingly sought after in Romania, as a recreational alternative for adrenaline rush junkies. In Maramureş Land there is no offer of tourism services that includes rafting, but this sport is practiced by amateurs, especially on Vişeu River. The rivers of Maramureş Land that are suitable for rafting are Iza, Vişeu, Vaser, Mara, Tisa and Săpânţa.

The longitudinal section of some parts of the main Maramureş valleys do not require any improvements in order to practice rafting. However, some do need such improvements by deepening the river bed and creating water drops to increase the tourists' thrills. In the case of low flowing rivers, some works can be implemented by constructing small embankments and water accumulations, that can be released in a controlled manner to ensure a water flow that is suitable for rafting. Such an example is the barring of the river channels, as in the case of Iza River, where, along its course, there are places that see the river split into two or more channels, or like Mara, which splits near Sat-Şugatag. On some Maramureş rivers there are problems due to the

widening of the river, but the main concern is the low slope angle of the river which leads to sedimentation, creating islets, especially near confluences. Such an example can be seen on the rivers Mara and Iza, near Vadu Izei. Rafting requires river sectors that have a less smoother and a more turbulent flow.

The length, flow and mineralization of Iza River allow it to be capitalized for fishing and rafting (on its middle course), and for canoeing in the lower course. The course of Iza River does not have many spectacular sectors, even though the discharge allows rafting. Iza has a sector that is quite suitable for rafting between Bârsana and Sighet. Mara River has a high potential for this sport, as it is accesible, without many anthropogenic interventions, on its entire course, from the village of Mara to its confluence with Iza.

Tisa is the best suited for rafting, due to its discharge and the mountain area that the river crosses. However, an obstacle for this sport is the presence of the border which is along this river. A possible course for rafting might start at Valea Vișeului, where Tisa enters the Romanian-Ukrainian border, until Sighet, having a length of 32 km.

The main rivers that are suitable for tourism capitalization in Maramureș Land

Table 1

Crt. no.	The name of the river	The length of the river in the analysed region (km)	The length with the possibility of capitalization (km)
1.	Iza	83	10 rafting; 5 canoe
2.	Vișeu	80	6 rafting
3.	Tisa	63	32 rafting
4.	Vaser	43	6 rafting & canoe
5.	Mara	40	21 rafting & canoe
6.	Săpânța	20	10 canoe, 5 rafting
7.	Ruscova	39	14 rafting & canoe

For Vișeu River, the best sector for rafting is the one between Petrova and the confluence with Tisa, as the river goes through a gorge, and the discharge is higher as it approaches the confluence. Even if it runs through a volcanic region, mineralization is low. This leads to the development of a rich aquatic fauna, with possibilities to capitalize this potential through sport fishing and recreation. Its tributaries, Vaser (43 km) and Ruscova (39 km), are fast-flowing and suitable for rafting. The tributary of Vișeu, Vaser, has a gorge sector, 42 km long, ideal for rafting and canoeing.

As for Săpânța River, its sector suitable for rafting is relatively short, but spectacular due to the gorge formed in a volcanic region. Having a steep slope and an average flow of 3.8 m³/s, the river is appropriate for rafting, with a very rough surface with boulders up to 50-70 cm in diameter that have been dislodged and transported from the volcanic range. Along the river, there are smaller drops and also larger drops where waterfalls are formed, with suitable heights for wet climbing, and ice climbing in winter. At the confluence, the slope is low, creating a marshland favourable for lakes that can shelter species of golden and rainbow trout for fishing. The highly oxygenated river water (9.5-12 mg/l), with a pH that varies between 4.5-9, is rich in rainbow trout, with possibilities for sport and relaxation fishing.

On the river sectors that fulfil the conditions for sports like rafting and canoeing, further activities can be added such as mock naval battle or retrieving objects from the water. Rafting can be classified as an open air recreational activity or a team sport where movement coordination is crucial. The practice period depends on the water level, the best months being April, May, the start of June or autumn, if precipitation is adequate. The months of July and August are also suitable for this sport, if the water level is high enough.

Another sport with a capitalization potential in Maramureş Land is canyoning, which involves going through a rough sector (rocks, jumps, steep valleys, waterfalls, basins) with a large difference in height, carved into the rock by water. The complex mountain topography, due to genetic and modelling factors, offers the possibility for canyoning in many places in the mountains of Maramureş Land (Covătari Waterfall, Pişătoarea Waterfall). Runcu Valley is one of the best suited for canyoning, with a lot of rapids, sometimes on rock walls.

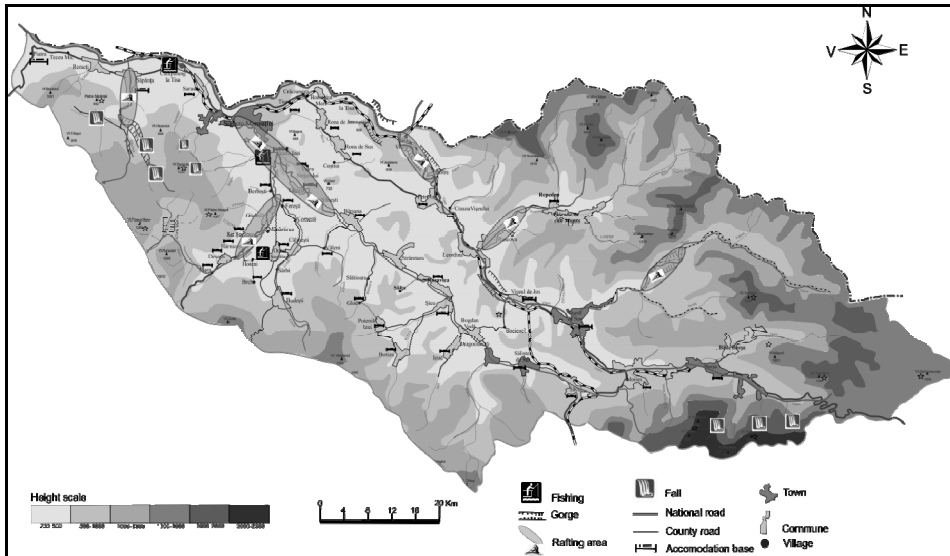


Fig. 1. Area with excellent conditions for water sports.

The waterfalls contribute to the landscape's spectacularity in Maramureş Land. Waterfalls like Cailor (Borşa), Strungi (Sighet), Covătari, Runcu and Şipot (Săpânţa), are extremely important for the development of sport tourism through wet climbing and ice climbing in winter.

In addition to water sports, the hydrographic potential can be further capitalized by ensuring the recreation of the regional urban population through picnic tourism. Unfortunately, we notice a lack of facilities and / or the deplorable state of lakes and rivers, which makes them unattractive for recreation, being mostly exploited from a scenic point of view. The number of lakes that have recreational equipment, like hydrobicycles and boats, is reduced. This kind of equipment is found only in one area – Găvrilă Lake (Ocna Şugatag). This lake also has a small strip of beach, unlike other lakes in the county.

3. 2. Scientific tourism

The hydrographic network includes lakes, ponds, marshlands, oligotrophic swamps that contain a valuable biodiversity both for science and tourism. The wet areas change their size during the year, some even disappear during summer, reappearing after rains or due to snow melting.

The oligotrophic marshes from Maramureș are the most representative in Romania. The peat found here is of high scientific value, being an „archive” for past and present biodiversity. This can form the basis for inferences regarding the evolution of climate and vegetation.

This form of tourism is in an incipient stage, being performed only by dedicated biologists, but can form a perfect material for consolidating the students’ knowledge during open biology and geography classes, coordinated by their teachers. Moreover, they can lead to research studies for bachelor students, during laboratory classes, and also for publications.

The multitude of marshlands and the general lack of interest in knowing them, with the exception of researchers and dedicated persons, often leads to their omission from maps.

The lakes that exist in the depression area of Maramureș are mostly man-made, being divided into two categories: salt water (Ocna Șugatag) and fresh water (Câmpulung la Tisa, Petrova, Sighet). Most lakes are used for recreation and fishing, but there are a series of small lakes used for aquafarming, mainly for trout (Săpânța, Călinești, Ieud, Piatra, Mara, Desești).

3. 3. Curative tourism

From all the natural resources of Maramureș Land, salt was the most important one for the historical and social-political evolution of the area. The existence of salt deposits in the region is due to the paleogeographical evolution of the territory during the Quaternary Period. The most important salt deposits in Maramureș Land, capitalized at present, can be found at Ocna Șugatag and Coștiui. The collapse of the old salt mines led to the creation of salt lakes, mainly capitalized on a regional level. Other rich deposits, identifiable due to mineral water springs, can be found in the area of Slătioara, Botiza, Bogdan Vodă, Ieud, Sălișteea de Sus, Rona de Jos. The salt waters are used for health and spa tourism in Ocna Șugatag and Coștiui. In other places, the waters are used within the households, for food preservation.

The mineral water springs found in the region enhance the hydrographic richness. Many mineral springs are suitable for spa usage due to their flow and chemical characteristics, but their present day usage is limited to the local level. The existence of such springs with a considerable sulphur content is due to the old volcanic phenomena that took place in this region. The sulphurous springs are plentiful, and can be found in: Vadul Izei, Oncești, Bârsana, Botiza, Poienile Izei, Bogdan Vodă, Ieud, Sălișteea de Sus, Săpânța, Borșa, Crăciunești, Breb, Câmpulung la Tisa, Crasna, etc (fig. 2).

The presence of chemically varied hydromineral deposits of curative importance contributed to the emergence of tourism in this area. However, over time, they were abandoned, and today they are used by locals who know, from experience, the benefits of these waters. The usage of mineral waters for treatment and cure started a long time ago in Maramureș County, in spa type settlements. The most famous spas were Săpânța, Breb,

Văleni-Feredeaua, Ieud, Crasna, Șugău-Feredeaua (fig. 3). One can still find facilities for balneotherapy in some settlements with a long standing tradition, old spas, that, unfortunately, no longer cope with the times, being left in a state of decay and abandonment (Poienile de sub Munte, Dragomirești, Crăciunești). The last few years saw some attempts to revitalize some of the settlements formerly used as spas, by building facilities and capitalizing the waters at a local level (for now), and less through tourism, but with promising perspectives for their reintroduction in the tourism circuit (Botiza, Câmpulung la Tisa).

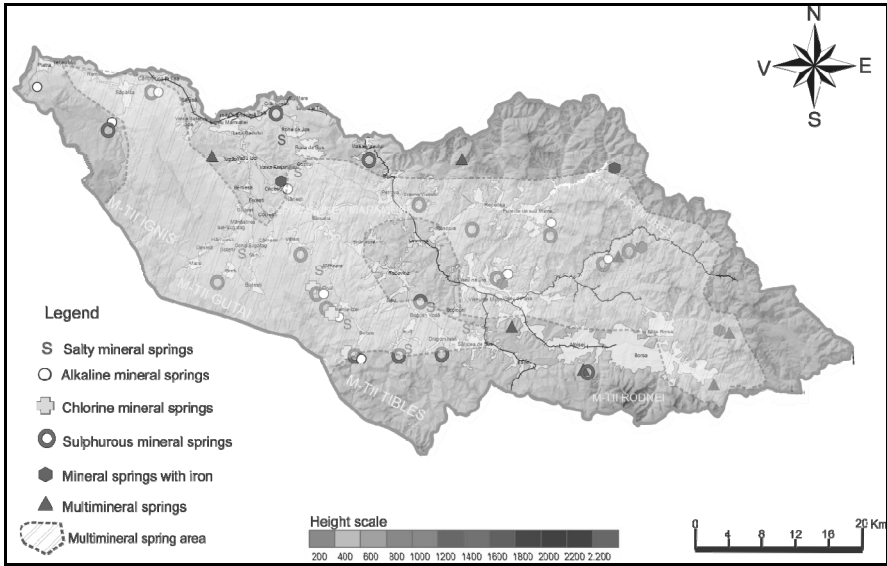


Fig. 2. Sparkling mineral water typology and its distribution in Maramureș Land

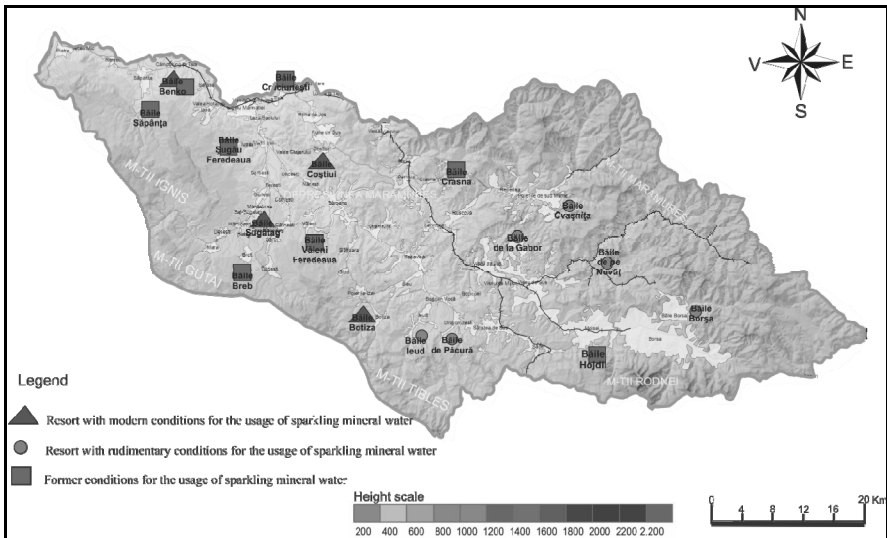


Fig. 3. Facilities for the usage of mineral waters

The richness of curative natural resources found in Maramureș offers many and diverse capitalization possibilities, but for now the facilities for balneotherapy are lacking, some do not meet the standards, while some are not used at all.

4. CONCLUSIONS

The hydrography of Maramureș Land includes numerous resources, many left unused, which form the basis for the territorial planning regarding curative and recreational tourism, with possibilities for a sustainable development of rural tourism in Maramureș.

Groundwater, through its characteristics, microclimate and scenic beauty, leads to the construction of secondary residences and tourism facilities for sleeping, dining, recreation. It usually takes a lot of time to make these areas suitable for tourism, due to financial or bureaucratic reasons, that is why suiting the lakes and rivers and their adjacent areas for tourism services is poor within the analyzed region, but the perspectives are promising. The most numerous initiatives regarding the arrangement of hydrographic components (lakes) are those that involve small trout fisheries, mainly used for fish trading and less for recreational and sport activities. The exception is Meghery Lake (Câmpulung la Tisa), that is meant for sport and relaxation fishing.

Other lakes within the depression area of Maramureș Land are the ones at Ocna-Șugatag, which, besides their scenic function, are used for recreational tourism, and then for curative and sport tourism.

The existence of a surface covered by flowing or stationary water changes the scenery, making it more attractive.

Adventure sport tourism is a continuously growing market, with many possibilities for capitalization within the presented area due to its hydrographic richness. The rich and diverse hydrographic network, with great potential for boosting rural tourism, is not capitalized as it should be.

Another way to capitalize hydrography through tourism is creating old peasant type installations (mills, whirlpools), that can use the river energy for power, thus also capitalizing the cultural tourism of the area.

The existing lakes are insufficiently fit for recreational purposes. The diversity of hydrographic components has a good frame for sustaining tourism activities even without large construction projects, only with minimum effort.

The attractiveness of present day rural tourism can suffer if the provided services are not diversified. The hydrography of Maramureș Land represents an important capitalization potential for rural tourism, through recreational activities.

The development strategies for rural areas must take into account the inexhaustible natural resources, such as rivers. Most settlements are situated along rivers, that can contribute to the economic and territorial development of these places through different forms of tourism, but only after their proper planning. The curative tourism of Maramureș Land is centred on the existing spas, but also on the development of other tourism products that can make use of the hydrographic resources. The hydrographic components offer an opportunity for the diversification of tourism activities within the region.

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LAND LAW AND ITS IMPACT ON THE RURAL SPACE IN ROMANIA

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ABSTRACT. - **Land Law and its Impact on the Rural Space in Romania.** Through its functions, rural space is both an objective reality, as well as the outcome of a continuous evolution of some goal-oriented conscious actions. As a determining function, agriculture is mainly put into practice through agrarian structures which, in their turn, are being influenced by land legislation. Consequently, rural space is not only an objective reality, but also the outcome of constantly progressing/regressing actions which are materialized via spatial planning, aiming at ensuring by means of specific instruments – in the middle of nature and often against nature – the existence and well-being of the population.

Keywords: *Romania, rural space, land legislation.*

1. INTRODUCTION

Romania has a particular position on the European continent, being situated in a transition area both to the East, as well as to the South, at the border between the peninsular Europe and the Continental Europe, feeling the physico-geographical and especially the political-economic influences of the two areas of Europe in its general and especially agricultural development.

Romania's territory, as it appears, reveals the harmony of the geographical structures and of the agrarian potential – starting with the landforms, the hydrographic network, the soil and vegetation, the use of land and land planning, and ending with the communication methods, the network of inhabited areas and related economic activities, thus reflecting its natural-economic valences integrated within a continuous process of sustainable development, exploitation, restructuring, harmonious planning.

Within this entirety, rural space is all to be seen outside towns and municipalities, expressing the coexistent order between nature and the outcome of certain goal-oriented continuous voluntary actions; agriculture is the determining function whereas the territorial structure is determined by the land legislation. Consequently, agriculture is the foundation of rural economy in its capacity as sole owner of the territory as production and use, as well as population and settlements.

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Rural space is thus the expression of the coexistent order of the objects of material world, the position, location, form, size, surface and efficiency can only be fulfilled when coherence is achieved according to the main function of some viable agrarian structures as a factor of stability and economic growth in compliance with national strategies and sectoral programs correlated with EU directives and regulations.

This requires first of all the sustainable use of the land fund via the integration of socio-economic principles with the conservation of the environment, in order to achieve food safety, soil quality protection, economic and social viability through the diversification of economic activities – vegetal and animal production, industrial processing of agricultural, forestry and fishery products, handiwork and small scale industrial activities, tourism services and agro-tourism (the National Strategy for the Sustainable Development of Romania Horizons 2013-2020-2030, 2008).

2. LAND LEGISLATION DURING ITS HISTORICAL EVOLUTION

The land legislation enforced during our historical evolution along with each land reform - every 25 years – has easily solved existing problems as far as social action is concerned, still it ruined some viable structures, subsequently becoming much more difficult to reconstruct them. This happened because in all the cases, agrarian structures issues were solved according to the classic formula (there was a permanent slight moral and social resistance) “property right is a natural right”, meaning that everybody was entitled to property, even more strengthened in a period (after 1945) through the use of the concept according to which “land is property of those who work on it”, thus becoming decisive the principle of land social utility and function – ensuring the support of farmers, thus confirming that property establishment and re-establishment has always been meant to offer social assistance.

Even if in certain periods of time this solution was reasonable, in the contemporary age, an land reform can only be considered as efficient if the land – as the main means of production – is managed to allow the incorporation of the highest possible coefficient labor capitalization, organization, planning and management with a view to achieving higher quantitative, qualitative and economic outcomes in the framework of the national and world competition.

It is without doubt that agrarian structures – occurred as a result of the land legislation – should have fixed adequately the opposition of the concepts small-sized property - large-sized exploitation by considering as complementary the two forms taking into consideration the particularity of each natural-economic area, the evolution and the level of economic and social development, in general, and agricultural development, in particular, thus creating the necessary conditions for non-repetition of the agrarian phenomenon.

Nonetheless, the 7th Land Reform in Romania, deriving from the land legislation – starting with Law 18/1991 – Law on land fund – disregarded the axiom „property and exploitation are two different things”, which would have ensured the preservation of the existing agrarian structures which had been accomplished by the efforts and sacrifice of the post-war generations for the development of agriculture from its traditional forms to the modern organization, instrumentation and management forms.

In the context of the idea that "associative forms are the future of Romanian agriculture", this concept could not be adequately put into practice in the agricultural policy, respectively in the land legislation; if things were different, this would have ensured in the area of private property the advantages of large-sized exploitations, already existing structures, and all that needed to be done was the rectification of the retribution, respectively the implementation of the rent for the land owned and the participation in the profit of units (exploitations, farms) which just needed to be adjusted to the requirements of the market economy.

Considering that the great land reforms resulted in the dissolution of the large latifundia and the apportionment of property (for peasants), eliminating the strong feudal remains by changing the destination of property, were merely meant to play the role of a social assistance tool (Bulgaru, 1936), the land laws after '89 (Bold&Craciun, 1995; Bold&Craciun, 1998; Bold&Predila, 2003), which almost over night replaced the mighty producer with the small farmer, who had no capital and lacked the necessary equipment and, in many of the cases, was unfamiliar with the production technologies implemented, resulted in the disintegration and irrational use of land, respectively the decrease of agricultural production and the transformation of Romania into a marketplace.

Historically speaking, we should not omit the fact that the peasant-owner is an element of stability and social balance, still the dissolution of large production units (such as CAP, IAS, complexes, farms) in which modern techniques and technologies could have been used, having the land agglomerated and organized in optimally placed and sized farms - each following a certain pattern according to the particularity of the agricultural production, was a bad choice as they would have materialized in the framework of rational agriculture systems the outcomes and recommendations of the scientific research in agriculture. The following systems accomplished until 1990 were dissolved or destroyed during the fast privatization process: 3.1 million ha irrigation systems, 3 million ha drainage systems, 2.2 million ha CES, 776 farms and stall-fed cow and ox facilities, 98 farms and stall-fed pig facilities, 138 poultry farms, 66 factories for mixed feed, silos and reception bases, orchards and vineyards, farms of the production agricultural cooperatives, storage centers, production centers of CAP and IAS, mechanization stations, dissolution of CAPs (4200), IASs (600), farms (24.000), respectively the failure to use over 65.000 higher education experts and over secondary education 15.000 individuals.

Consequently, we are now facing the same agricultural system as that existing 100 years ago, and the situation is even more exacerbated by the deindustrialization process which ruined the socio-economic balance of rural space and the depopulation of rural areas, both processes being encouraged by the European integration process and the globalization.

3. RESULTS AND DISCUSSIONS

Under the circumstances, the implementation of an adequate agricultural policy, respectively an adequate legislative framework is a must, having regard to the current situation of the Romanian agriculture, respectively the polarization of agrarian structures: 50% of the agricultural surface of 1375 million ha is in the possession of households having a surface of up to 10 ha (3.9 million households), whereas approx. 40% is owned by exploitations of over 100 ha (fig. 1 and 2).

In the current context, the prognosis according to which there will be a reduction of 2.4 million small-sized subsistence exploitations by 2013 (about 500,000 annually) by agglomerating these surfaces in middle-sized farms, is not a realistic one (the dissolution of industrial, mining, forestry etc. activities which were the main source of income for rural families, as well as the emigration of younger population, still make the small-sized farm the basic subsistence resource for the rural population, most of it being composed of senior citizens; it is also unrealistic to assume the production of energetic raw materials in agriculture as long as food safety in our domestic production is not guaranteed and as long as over 60% of the imports of food products can be produced in Romania.

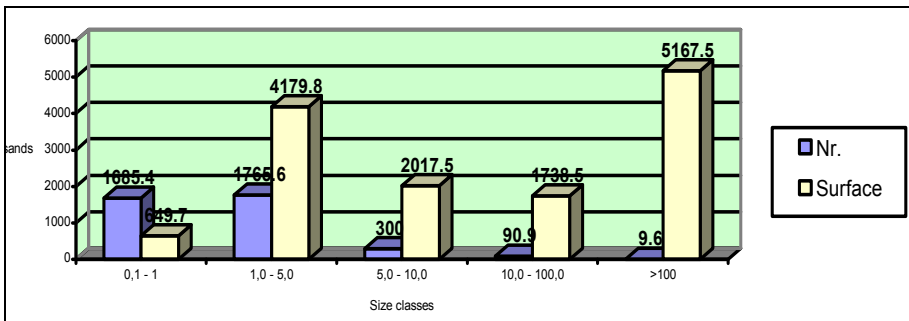


Fig. 1. Structure of Agrarian Surfaces.

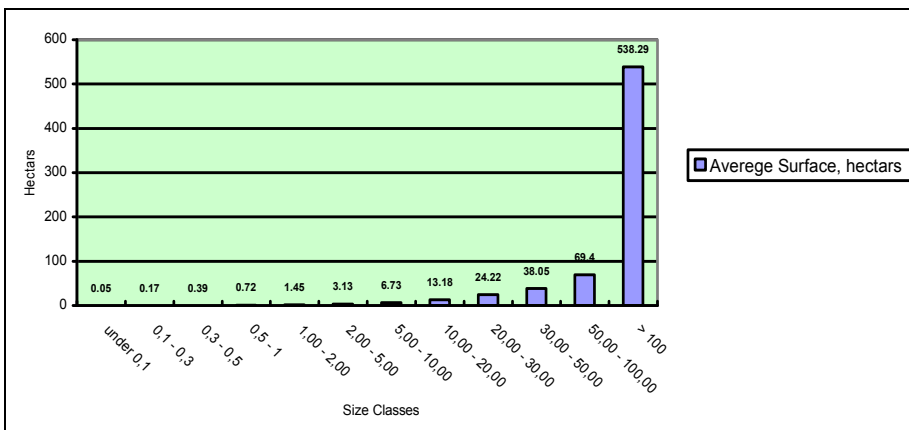


Fig. 2. Average Surface on Size Classes.

Having regard to the existing agrarian structures and the national economic imbalance due to deindustrialization, the protection of national production is a must, by harmonizing the development of multifunctional agriculture in close connection with the environment and in compliance with the Common Agricultural Policy of the EU covering the complexity of all its economic, socio-cultural and environmental functions.

For the development of agriculture and rural space, due consideration should be given to the provisions of the National Program for Rural Development – PNAR-2007-2013, establishing the increase of competitiveness in agriculture and forestry (Axis 1), Improving the environment and rural areas (Axis 2) and The quality of life in rural areas and diversification of the rural economy (Axis 3). Likewise, the National Strategy for Sustainable Development – 2013-2020-2030 and the Agriculture and Rural Development Strategy – 2009-2013 generating new financing systems for agricultural producers, processors and other such activities under the form of Structural Funds (European Regional Development Fund and the Cohesion Fund) for investments, have offered irredeemable financial assistance for structural, economic and social problems (European Social Fund – FSE, European Regional Development Fund – FEDR, the European Agricultural Guidance and Guarantee Fund, Financial Fund for Fisheries Guidance and the establishment of the first European institution in Romania – Agricultural Credit Guarantee Fund (FGCR).

Under the circumstances, all that needs to be done is the reimplementation of a policy involving the role of the state and the guidance of economic development, and not at all the sole responsibility of the market. Basically, having regard to the diversity of geographical conditions, of the natural and human resources, the diversity of property forms and usage of land, of the ethnic and cultural traditions, as well as the different level of socio-economic development, it is the rural space and agriculture to create such agrarian structures to ensure the usage of land, the technological equipment and the development of the network for processing, storage and marketing of agro-food production (Romanian Center for European Policies – CRPE – 2009; Joint Declaration of the Ministries of Agriculture, 2011).

To this purpose, the integration into the Common Agricultural Policy of the EU and into the National Program for Rural Development for the period of time 2007-2013 facilitated direct subsidies and the use of EU funds for the modernization of agriculture and the increase of competitiveness of Romanian agricultural products, as well as rural development. The priorities of the program are concretized in 4 fields of activity (axes): Axis 1: Increase of competitiveness in agriculture and forestry – 45% of the total of EU funds; Axis II – Improving the environment and rural areas – 25% of the money dedicated to the other fields of activity. European irredeemable funds are awarded for the following types of private investments: modernization of agricultural exploitations; increase of the economic value of forests; increase of the added value of agricultural and forestry products; improvement of the agricultural and forestry infrastructure; diversification of non-agricultural activities; encouragement of tourism; basic services for the rural economy and population. It is worth noticing that the middle-term Strategy 2009-2013 highlighted the structural deficiencies that increase the gaps as compared to the other Member States – plots fragmentation, insufficient or outdated technological facilities – stipulating as a fundamental measure the reduction of the fragmentation of agricultural surface and the stimulation of agglomeration of small-sized farms (about 3.9 million with an average surface of 2-9 ha; having also defined the minimum limits for agricultural exploitations, smaller farms are considered to be family agricultural exploitations).

However, these dimensions have not been correlated with the strict entirety of the European legislation according to which small-sized producers (private individuals or small-sized farms) sell small amounts of food products produced in their own household to end consumers (Agricultural and Rural Strategy 2009-2013).

In this context, semi-subsistence farms covering between 2 and 8 ESU in size are being assisted via irredeemable funds. The Economic Size Unit (ESU) is the unit expressing the economic size of an agricultural exploitation, which is calculated based on the standard gross margin of the exploitation (Decision no. 85/377/EEC of the Commission) and one economic size unit amounts to 1.200 Euro.

As a matter of fact, farmers, local public authorities and organizations willing to obtain structural funds from the EU have at their disposal active measures, under the form of projects consisting of selection criteria and beneficiaries established by the Ministry of Agriculture and Rural Development. Individuals may currently submit projects for 8 types of activities: settlement of young farmers (measure 112); modernization of agricultural exploitations (measure 121); increase of the added value of agricultural and forestry products (measure 123); assistance for the semi-subsistence farms (measure 141); establishment of the groups of producers (measure 142); establishment and development of micro-enterprises (measure 312); encouragement of tourism (measure 313); renovation and development of villages, improvement of the basic services for the rural population and rural economy and assertion of the rural inheritance (measure 322); functioning of local action groups, acquisition of competence and territory revival (measure 431).

Under the present circumstances, agricultural policy should be differentiated according to the current situation, respectively the existence of small-sized subsistence and semi-subsistence households, on the one hand, and the existence of large-sized exploitations, on the other hand (established via association, leasing or cooperation) providing the market with agricultural products, constantly in favor of association, cooperation, leasing (Fig. 3 a, b). It is thus to finally understand that the establishment of middle-sized properties (through purchasing or agglomeration) is no longer a viable solution.

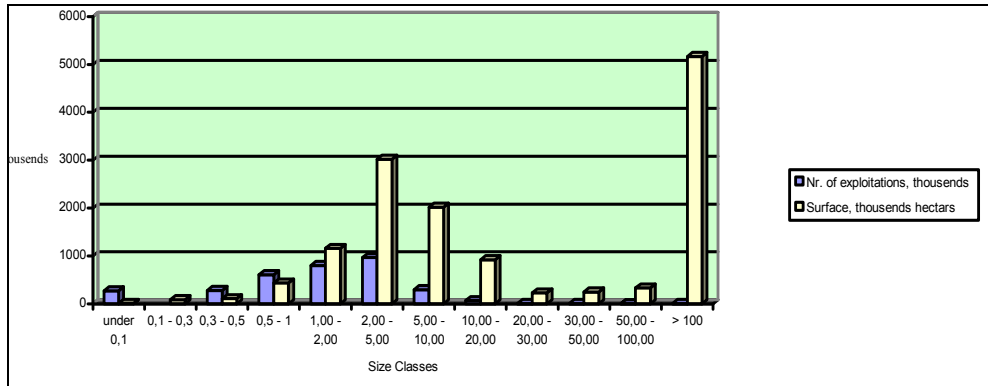


Fig. 3a. Structure of Agrarian Surfaces and Number of Exploitations.

It is a must that the assistance awarded to farmers producing agro-food products should be diversified in terms of their technological facilities and their integration as to the processing and marketing of their products, lawfully compelling supermarkets to sell minimum 50% of the Romanian products.

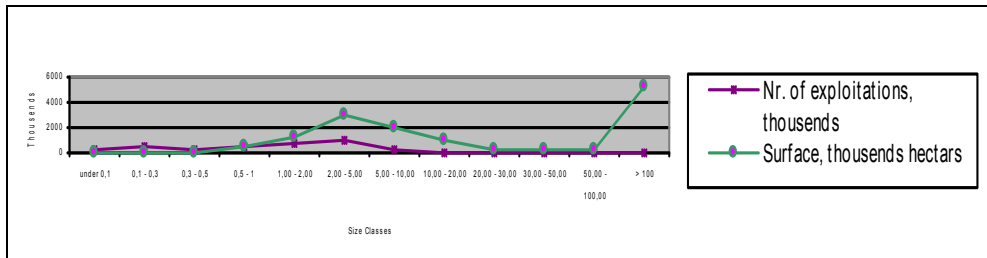


Fig. 3b. Structure of Agrarian Surfaces and the Number of Exploitations on Size Classes.

Supporting small-scale agriculture is a necessity in order to contribute to its comprehensive integration into the economic activity, thus contributing to the consolidation of competitiveness and the preservation of the vitality of rural areas – avoiding depopulation and land abandonment, ensuring a balanced rural development, especially in mountainous and in underprivileged areas, eliminating depopulation and village “dormancy” in the traditional natural economy - in order to facilitate the transfer from and subsistence economy to the commercial economy through the economic organization of farmers (associations, cooperatives, companies, groups of producers). The main agricultural producers are companies, within the meaning of Law 31/1990; republished, with subsequent amendments; agricultural firms and other forms of association in agriculture, within the meaning of Law 36/1991; associations in compliance with GO 26/2000 on associations and foundations, approved by amendments and additions via Law 246/2005; agricultural cooperatives, within the meaning of Law 566/2004 and any other legal form of association, in compliance with the laws in force.

In the capitalist context, the agricultural producer is more and more playing the double role of buyer of industrial products and seller of agricultural products, thus requiring such priority measures:

- Development of associative, respectively cooperative structures (collective cropping, supply and capitalization, credit institutions, specialized capitalization cooperatives (cereals, fruit, vegetables etc.), and of groups of producers equipped with warehouses which can store enough products for supermarkets and for export purposes. The tradition and experience of many other countries confirm that association is a must, still the Romanian state must play its judiciary role by guaranteeing reference prices and the reduction of their fluctuation, as well as advantageous credits – as incentives for the association;
- Improving market functioning conditions by eliminating monopolist situations and regulating the flow of products in the agro-food chain. The failure to organize markets (producers, processors, warehouses, sellers) results in an unreal market price, thus bringing prejudice to the agricultural producer, who is often unable to cover his/her production costs. The legal provision – as mentioned before – according to which at least 50% of the agro-food products must by all means be of Romanian origin in supermarkets;

- In favor of credits, with an interest of maximum 10-12%, over a period of time of 20 years, for all small-sized and large-sized producers, by eliminating any restriction, respectively guaranteeing co-financing not only via their own production-based activities, but also via Rural Credit Guarantee Fund (RCGF), created by the Ministry of Agriculture and Rural Development, which guarantees through banks a credit up to 80% of the total value, thus creating a partnership among Fund-Bank-Farmer. This approach shall ensure the development of agricultural activities, the decrease of the level of under-development of non-agricultural activities, the more comprehensive exploitation of the available human and economic potential, providing the financial resources necessary for a strategically adjusted and oriented implementation of the Community and National funds. The Lisbon Strategy of the European Union established the following community-goals: competitiveness, improvement of agricultural and forestry land, sustainable development, increase of the quality of life.
- A policy of direct intervention by the state in order to ensure social balance based on the stabilization of farmers' income, by assisting subsistence and semi-subsistence households to cover first-necessity expenses (social protection) and production costs having regard to the "promises" made in 1989, as well as agro-environmental subsidies for under-privileged and mountainous areas. All these actions should be taken in order to permanently leave out the idea according to which agriculture is a national priority exclusively in statements and on election agenda in terms of the Release of the National Rescue Front towards the Population aired on December 22nd, 1989, under point 5: „Restructuring agriculture and the assistance of small farmers' production”.
- An investment policy of the state to rehabilitate land improvement systems – irrigation systems, drainage systems and soil erosion control, development of the infrastructure and the increase of the tourism capital through the conservation of vital elements (soil, water, forests, flora, fauna).
- Differentiated taxation on land, having regard to the value of the land which is determined by the capitalized rent in order to ensure the exploitation of the land to the general good and sanctioning those who fail to cultivate it or fail to protect and conserve it. The tax should be considered as the sum of the differential rent I – respectively the natural fertility of the land, as well as the differential rent II – respectively its location in the territory and capital investments (land improvement works, plantations etc.)
- Giving support to agricultural exploitations through land survey and territorial organization – free of charge, by specialized bodies of MADR (Bold, 2011), with a view to creating rational and economic agrarian structures for each commune, according to the specific conditions and taking into consideration the county and commune territory plans, as an integral and simultaneously open system, ensuring conformity among land resources, environmental requirements and envisaged development, polarization centers and communication flows, ending with the organization and planning of each category of usage and the creation of differentiated cultivation systems (crop-rotation, strip cropping,

grassy strips, agro-terraces) in compliance with the recommendations of the scientific research community. Rational and economic agrarian structures can only be considered when the land is so organized and planned as to allow the implementation of the highest coefficient of capitalization, labor and management, competitive through the products produced on the national and world market, in accordance with the environmental requirements and the envisaged development from an economic, social and territorial point of view.

- Continuous improvement of the legislative and normative framework and the elaboration of a Rural Code, consisting of all the laws in the field of agriculture, forestry and related fields, in order to facilitate the process of information-documentation and the implementation of actions which have grown to be highly essential in the context of diversification of the property forms and economic activities.
- The strict control by the state of all agro-food products entering our country without paying adequate taxes and VAT, thus acting as a disloyal competitor in relation to the Romanian products and all the agricultural producers.

In our opinion, it is high time we changed things in the current history of Romania by giving agriculture what it needs to be given – its place as a vital field of activity, elaborating an adequate legislation with a view to creating viable agrarian structures according to the specific natural and economic conditions of each area and settlement.

To this purpose, the Department for Territorial Organization and Land Survey, including terrestrial measurements (geodesy, photogrammetry, remote sensing, cartography), which have initially been created and developed within the field of agriculture as the main owner and user of the land fund and rural space, must be transferred again to the Ministry of Agriculture and Rural Development.

This is imperative as it is essential to get familiar and rationally use the land in the framework of viable agrarian structures, in terms of adequate technological equipment of the territory and settlements, and the rural space in its entirety.

It is widely known that based on land survey, through a set of technical, economic and legal operations, we get to know and systematically and constantly take an inventory of the land fund in terms of its quantity, quality and legal status, respectively the surface, category of usage and its owners.

Otherwise the territorial organization represents a complex technical and economic activity, whose role is to create economic agrarian structures through land agglomeration (eliminating dispersal, fragmentation, disintegration), through the placement of various usages in compact real estate complexes, within optimally located and adjusted exploitations and farms, with the surrounding land adequately organized respecting the natural conditions (relief, soil, hydrology, climate), according to the development techniques (hydro- technical, biological, agro-technical), water distribution in soil (irrigation, draining), cultivable land systems (crop rotation, strip cropping, grassy strips, agro-terraces), modification of biological soil conditions (soil amendment, fertilization), differentiated organization of each usage in units of optimal sizes and forms (fields in rotation, strip grounds, lots, roads), constantly ensuring the rational use and the conservation of natural resources, fittings and technical equipment.

These secular activities have been performed by means of a constantly improved and developed system, especially over the past 50 years, after the creation within the Ministry of Agriculture of the Institute for Agricultural Studies and Design – ISPOTA (HCM 1240/1953) and the Institute of Geodesy, Photogrammetry, Cartography and Territorial Organization – IGFCOT (HCM 87/1971 and Decree 207/1973), dealing with research, technological engineering and design, whereas at the level of counties – the Office of Land Survey and Agricultural Territorial Organization – OCOTA.

IGFCOT and OCOTA efficiently used a unitary system of measurements, land registration plans and maps on different scales, meeting all the requirements of the national economy, of the geodesic and cartographic data bank, of the cadastral data bank, as well as a unitary system for territorial organization.

All this activity, having its own executive structure for terrestrial measurements, land survey and territorial organization, created and equipped by the Ministry of Agriculture, has been transferred under the area of competence of the Ministry of Administration and Home Affairs (at the request of an unprofessional minister of agriculture, priest Ilie Sârbu, so that he should avoid being asked questions regarding the enforcement of law 18/1991). Considering the diversity of the property forms and the land use, this activity should have been by all means subordinated to the Ministry of Agriculture. Furthermore, ignoring the provisions of Chapter VII of Law 18/1991 - Law on land fund, Territorial organization and planning have been abusively dissolved as an activity.

Consequently, the Ministry of Agriculture has been deprived of its main technical instrument which used to make possible the systematic and permanent familiarity with the land fund - from a quantitative, qualitative and legal point of view, respectively surface, use and owners, as well as of those bodies in charge with the creation of viable agrarian structures based on territorial organization and planning. As a result, some of the negative effects were: no inventory of land, no statistics of owners, uncultivated land and irrational use of land, the uncoordinated placement of investments, the lack of designing activities for the organization of viable exploitations through agglomeration, association, farming and the implementation of rational agricultural systems which are recommended by the field of scientific research, failure to use EU funds, failure to have a real tax and duty basis etc., failure to achieve a coordinated development of rural areas.

It is worth mentioning that the lack of territorial order, the dispersal and fragmentation (47 millions of lots compared to 22 millions of lots before the war) had the following consequences: 1/3 of the agricultural land is not cultivated, the impossibility to ensure the increase of the agricultural production resulting in the import of agricultural and food products.

As a matter of fact, with a view to accelerating the process of general land survey, Law 7/1996 – Law on Land Survey, established the National Department for Land Survey, Geodesy and Cartography which, via a number of other laws (Law 590/2001 on the organization and functioning of the National Department for Land Survey, Geodesy and Cartography, GEO no. 70/2001 regarding the replacement of the general land survey with the agricultural land survey, Law 308/2001 on the transfer of the national land survey body under the competence of the Ministry of Administration

and Domestic Affairs, GO no. 41/2004 regarding the amendment and supplement of the law on land survey no. 7/1996, Law 499/2004 on the establishment of the National Agency of Land survey and Real Estate Advertising, GD no. 1210/2004 on the organization and functioning of the National Agency of Land survey and Real Estate Advertising etc, which was transferred at the end of the year 2011 under the competence of the Ministry of Regional Development and Tourism) generated the dissolution of agricultural territorial organization, the development of some extremely convenient structures to the benefit of land survey, turning an activity to be performed in the field into an activity to be performed in an office - mostly focusing on the legal circulation of land and real estate goods. It is striking that the institution in charge with this activity (a now autonomous institution – “state within state”) has failed over the past 15 years to perform the land survey in any of the communes in Romania, even though this was its main lawfully established activity. We highlight that this complex Agency has only been concerned to deal with the urban land survey in city and town areas and to obtain direct material advantages in its relations with the citizens regarding the legal circulation of land and real estate assets; at the same time, the rural area (95% of the territory of Romania) is dominated by chaos; there is a deficiency of information concerning the land fund and territorial agglomeration and organization, in the context of property forms diversification.

Under the circumstances, the only viable solution has in view the transfer of this activity (land survey) from the Ministry of Regional Development and Tourism back to the Ministry of Agriculture and Rural Development and its reorganization as General Direction (instead of Agency) in order to be efficiently coordinated and controlled. It is also of great importance to go back to the former structure (OCOTA + IGFCOT), also covering agricultural territorial organization, thus bringing back into existence the main body in charge with the inventory and rational use of land, the establishment of a viable agrarian structure with agglomerated and organized lots of land, with a view to implementing rational agricultural systems which are recommended by the field of scientific research.

This necessary reorganization, whose main objective is to revive the activity in the field of Land survey and Territorial Organization, has a double effect: carrying out the technical, economic and legal evidence (respectively the identification, description and entry into cadastral documents of all buildings – land with or without constructions – existing in the entire country, regardless of their destination and owner, with a view to registering them in the Land Register), as well as the accomplishment of agricultural territorial organization and planning, arrangement of agricultural exploitations without which agriculture cannot fulfill its functions because it requires the existence of economically viable agrarian structures, having a territorial stability – as basis for the implementation of rational agricultural systems which are recommended by the field of scientific research.

4. CONCLUSIONS

As a consequence, an agricultural policy which is adequate for the existing agrarian structures (polarized) in which 8.9 million ha of the total of 13.75 million ha agricultural land belong to 3.9 million households, close attention should also be given to these so that they can be thoroughly integrated into the economic circuit both to

ensure a more comprehensive consumption of the products for their own needs, as well as for marketing them, by economically organizing farmers (associations, cooperatives etc) who can ensure market competitiveness and the protection of producers' income.

This is even more important taking into consideration the high level of rural areas as basis for the promotion of an economically adequate legislative framework.

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THE CLASSIFICATION OF RURAL SETTLEMENTS ON FELEACU HILL

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ABSTRACT. – **The Classification of Rural Settlements on Feleacu Hill.** Feleacu Hill has been inhabited since ancient times, as proved by archaeological findings. Nowadays, due to the favourable natural conditions, there are 17 rural settlements spread out from the top of the hill to the lower parts. The paper presents the classification and typology of these villages. According to the demographic size, most of the settlements are small and medium-sized, less than 1500 inhabitants. Structurally, there are some concentrated villages, but the majority of the villages have a scattered structure, as the houses are separated by small lands, orchards or gardens. The texture of the villages is irregular, as they inherit the medieval network of streets. The economic functions are complex. However, most rural settlements have primarily agricultural functions, but those closer to Cluj-Napoca have mixed functions because they tend to become dormitory villages for people working in Cluj-Napoca.

Keywords: *Feleacu Hill, population census, linear village, scattered village, dispersed village, concentrated village, texture, structure, dormitory village.*

1. INTRODUCTION

Nowadays, rural settlements are still part of the Romanian society, and by analyzing them, important and useful information can be provided, for a better understanding of our traditions, values and of our society's way of living. By studying their past and present existence, one can provide predictions for the preservation and future development of the villages on Feleacu Hill (P. Idu, 1969). The presence of rural settlements in this area is the result of a sum of combined factors that were favorable to their location and wealth, such as: water supply, soil and subsoil resources, the existence of two important nearby cities: Cluj-Napoca and Turda, and, of course, the presence of roads, which cross the area and provide means of transportation for all the rural population living in these villages. But even if the conditions mentioned above are optimal, there still are differences in development between the villages on Feleacu Hill, as it will be shown below.

2. THE CLASSIFICATION OF RURAL SETTLEMENTS ACCORDING TO THEIR DEMOGRAPHIC SIZE

The demographic size of a settlement is the mixed result of the natural conditions of the analyzed territory and the socio-economic potential of the population (Gr. P. Pop, 2012). In time, the number of inhabitants has many ups and downs in these rural

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settlements, as it can be seen in the official data that is provided by the population censuses (I. Bolovan, 2000). So, in 1850, according to the population census, all the rural settlements on Feleacu Hill were included in the category of small villages (Ciurila, Pruniș, Sălicea, Săliște, Tăuți, Ceanu Mic, Comșești, Mărtinești) and medium villages (Aiton, Rediu, Feleacu, Gheorghieni, Vâlcele, Tureni, Micești). The same classification is preserved in 1857, but in 1869, one should mention the existence of the first village with more than 1500 inhabitants, Aiton (1550 people). As the population continued to increase, there were three villages in 1890, which were classified in the category of large villages, over 1500 people: Aiton, Feleacu and Gheorghieni. At the next population census, in 1900, one more village, Rediu (1525 inhabitants), joined the category of the above mentioned large villages. Following the same trend, some of the villages enlisted in the first census in the category of small villages, enlarged their population, and thus they were classified in the category of medium villages, having more than 500 inhabitants, such as: Ciurila, Sălicea, Ceanu Mic and Comșești.

The dynamics of the population in the villages on Feleacu Hill by censuses

Table 1

Villages / Year	1850	1857	1869	1880	1890	1900	1910	1930	1941	1956	1966	1977	1992	2002
Aiton	1301	1453	1550	1657	2018	2003	2184	2289	2413	2173	1890	1453	831	727
Rediu	1137	1124	1194	1146	1434	1525	1750	1843	2172	1581	1418	1319	795	611
Ciurila	435	448	478	506	533	579	621	612	629	605	487	354	233	236
Pruniș	211	164	235	249	254	300	334	357	399	397	302	227	147	139
Sălicea	379	370	483	500	539	578	569	735	734	706	567	485	326	283
Săliște	335	341	388	343	265	356	414	430	463	451	383	310	150	118
Feleacu	1272	1288	1439	1460	1719	2033	2231	2343	2437	2258	2317	2520	1849	1709
Casele Micești										73	68	34	0	11
Gheorghieni	1174	1181	1353	1340	1582	1680	2087	1871	1767	1749	1638	1701	1226	1077
Sărădiș										275	217	205	102	75
Vâlcele	875	867	959	972	1122	1161	1286	1447	1495	1432	1309	1423	939	938
Tăuți	226	236	292	281	339	367	429	510	612	497	378	336	197	214
Tureni	1016	992	1083	1045	1099	1134	1240	1450	1566	1408	1386	1363	1022	1027
Ceanu Mic	469	544	615	699	875	943	917	1020	984	859	816	734	546	519
Comșești	487	452	497	480	584	596	653	588	543	503	412	345	236	240
Mărtinești	202	190	166	175	228	226	256	367	466	539	579	563	371	383
Micești	986	988	1034	1068	1215	1214	1350	1468	1522	1423	1229	904	560	416

In 1941, the population census recorded the largest number of inhabitants for ten of the analyzed villages, and afterwards, the population was gradually declining, and this phenomenon was recorded for all the villages on Feleacu Hill. So, in 1941, there were six large villages: Aiton, Rediu, Feleacu (more than 2000 inhabitants), Gheorghieni, Tureni and Micești; six medium villages: Vâlcele (1495 inhabitants), Ciurila, Sălicea, Tăuți, Ceanu Mic and Comșești (543 inhabitants); and only three villages were in the category of small villages, under 500 inhabitants, Pruniș (399 inhabitants), Săliște and Mărtinești. At the population census in 1956, two new villages were recorded: Sărădiș, a small village (275 inhabitants, separated from Rediu), and Casele Micești, a very small village, having less than 100 people (73 inhabitants, separated from Micești).

Formally, these small villages were hamlets which already had a declining population when they were classified as villages.

In 1966, just three villages remained in the category of large villages with more than 1500 inhabitants: Aiton, Feleacu and Gheorghieni, and in 1977 the number of large villages dropped to only two: Feleacu (2520 inhabitants) and Gheorghieni (1701 inhabitants). At the population census in 1992 only Feleacu was classified as a large village, 1849 people being recorded at that time, and going from one extreme to another, in the village Casele Micești, there was no recorded population at all, as there was no permanent resident living in the village at that time.

According to the population census in 2002, the rural settlements on Feleacu Hill were classified as follows:

- very small sized villages, with less than 100 inhabitants: Casele Micești (11 inhabitants), Sărădiș (75 inhabitants).
- small sized villages, with a population between 100-500 inhabitants: Săliște (118 inhabitants), Pruniș (139 inhabitants), Tăuți (214 inhabitants), Ciurila (236 inhabitants), Comșești (240 inhabitants), Sălcea (283 inhabitants), Mărtinești (383 inhabitants) and Micești (416 inhabitants).
- medium sized villages, with a population between 500 and 1500 inhabitants: Ceanu Mic (519 inhabitants), Reditu (611 inhabitants), Aiton (727 inhabitants), Vâlcele (938 inhabitants), Tureni (1027 inhabitants), Gheorghieni (1077 inhabitants).
- large villages, with more than 1500 inhabitants: Feleacu (1709 inhabitants).

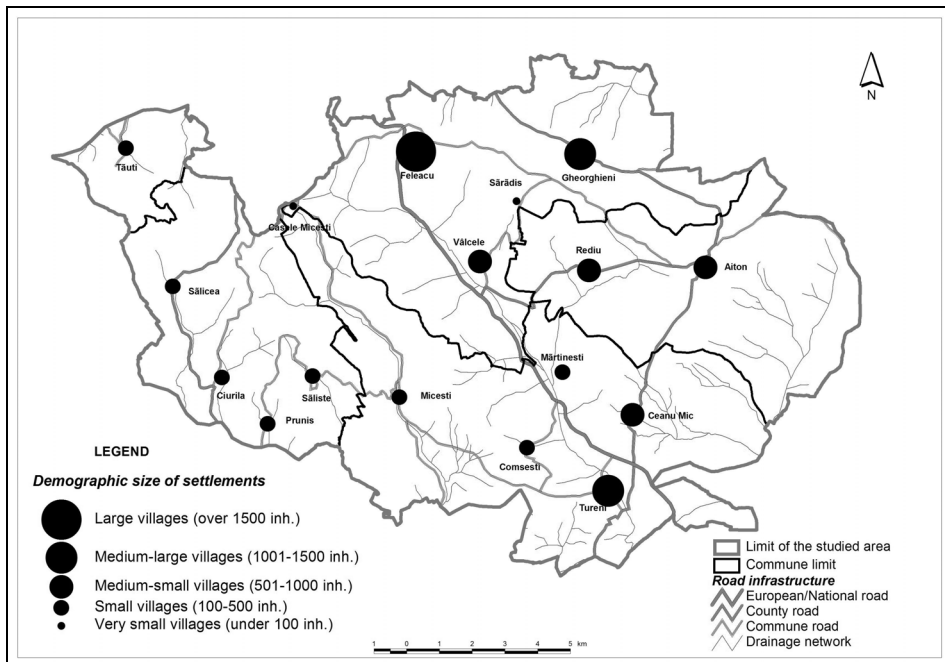


Fig. 1. The demographic size of settlements on Feleacu Hill in 2002

3. THE CLASSIFICATION OF RURAL SETTLEMENTS ACCORDING TO THEIR SHAPE, STRUCTURE AND TEXTURE OF THE BUILT-UP AREA

Taking into consideration the *shape of the villages*, all the settlements on Feleacu Hill have a non-geometrical or irregular shape of the built-up area, due to their ancient existence and permanent adaptation of the villages to the geomorphology of the terrain.

The *structure* of a village indicates the degree of concentration of the dwellings in the built-up area (V. Surd, 2003). Generally speaking, there are three major types of villages that are considered in Romania, according to the position of the dwellings in the built-up area of a village: the concentrated village type, the scattered village type and the dispersed isolated type (V. Mihăilescu, 1927; Alina-Gabriela Mureșan, 2008).

The concentrated village type is not characteristic for Feleacu Hill. Still, a concentration of the dwellings can be seen in the villages Ceanu Mic and Sălicea (especially in the new built-up area, where large houses are predominant), and in the centre of some of the settlements, in particular in the villages that hold the administrative position of commune seat (Feleacu, Tureni, Ciurila, Aiton).

On Feleacu Hill, most of the rural settlements have a scattered structure of the dwellings, as the houses are separated by small cultivated lands, orchards and gardens and the houses are aligned along the main means of transport (Al. Savu, 1987). Such is the case for Vâlcele, Pruniș, Săliște, Tăuți, Comșești and Rediu.

A peculiar case of scattered village is *the linear village*, which is formed along a transport route, such as a road, or a river. That is the case of Mărtinești, located at the contact between the hills and Racilor River flood plain. Some tendencies of linearity were also found in the case of the villages Tăuți and Sălicea, which developed some tentacle ramifications along some of the main stream tributaries or along secondary roads.

There is also the case of a *dual linearity*, when the dwellings are mainly located around two parallel roads, such being the case for Ciurila and Gheorgheni villages.

Another peculiarity of the settlements on Feleacu Hill is the presence and development of a secondary built-up area of a village, along the main road, at some distance from the ancient built-up area. This is the case for the villages Tureni and Vâlcele, which recently developed along the national and European E60 road, and along the way that connects the old core of the village with this new built-up areas.

A dispersed structure, with dwellings separated between them by large fields, or even forest, can be found in the small sized villages: Casele Micești and Sărădiș. In the case of the village Casele Micești, there are two separate and distinct cores, made up by only a few houses, and separated between them by a forest. At Sărădiș, the dispersion of the houses is more obvious on the top of Feleacu Hill.

The *texture* of the villages (the manner in which the road network is arranged) does not have a geometrical regularity, because most of the settlements inherited the structure of the roads from medieval times, so nowadays there is a very complex and irregular texture in these villages.

4. THE CLASSIFICATION OF RURAL SETTLEMENTS ACCORDING TO THEIR ECONOMIC FUNCTIONS

In general, a classification of rural settlements according to their economic functions is mainly established by taking into consideration the active population (J. Benedek, 2000). This is because only the job of an individual is recorded at the population census,

without providing the respective location. So, in the end the results may not be very accurate for the studied unit.

The rural settlements on Feleacu Hill may be classified as follows:

- Rural settlements with agricultural functions, where the majority of the population is active in the primary economic sector (agriculture, fishing, forestry): Săliște, Mărtinești, Rediu, Casele Micești, Comșești, Pruniș, Sărădiș, Micești, Ceanu Mic.
- Rural settlements with agriculture and service functions: mainly the settlements located along E60 road between Cluj-Napoca and Turda, and the commune seats: Tureni, Vâlcele, Aiton, Ciurila.
- Rural settlements with agricultural and residential functions (the tendency is to become dormitory villages): Gheorghieni, Tăuți and Sălicea, in which most of the active population goes to work to Cluj-Napoca.
- Rural settlements with mixed functions – agriculture, service and residential functions of the active population: Feleacu, the most typical dormitory village on Feleacu Hill.

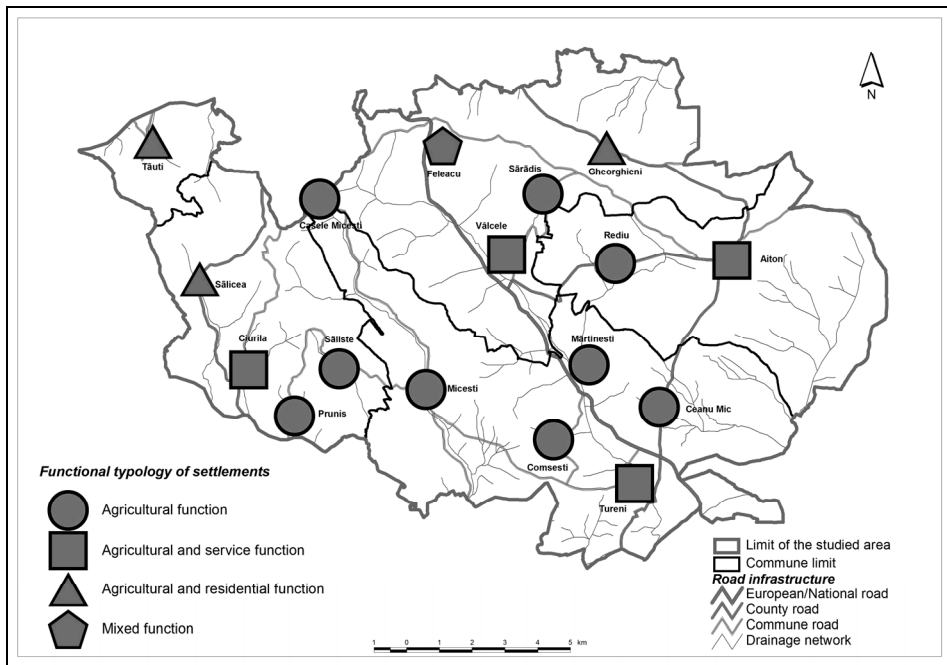


Fig. 2. The functional typology of settlements on Feleacu Hill

5. CONCLUSIONS

On Feleacu Hill, the environment offers good living conditions, so there is a high degree of humanization in the analysed unit. Because of the reduced slopes, high resources in water supply, gentle climate and forest vegetation, the rural settlements have a long

historical background (T. Nicoară, 2001) and developed from the top of the hill (Feleacu, Casele Micești, Sărădiș, Sălicea, Gheorghieni), along its permanent streams (Vâlcele, Reditu, Mărtinești, Tureni, Tăuți, Săliște, Micești) until the bottom of the hill, at the border with other geographical units, such as the Transylvanian Plain (Aiton, Ceanu Mic) and Iara-Hășdate Depression (Ciurila, Pruniș).

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POST COMMUNIST FUNCTIONAL CHANGES IN ROMANIA'S SMALL TOWNS. CASE STUDY: BEIUȘ LAND (BIHOR COUNTY)

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ABSTRACT.- Post Communist Functional Changes in Romania's Small Towns. Case Study: Beiuș Land (Bihor County). Until the establishment of the communist regime, the predominantly rural Romania had showed a slow evolutionary trend from rural settlements towards an urban status. This trend was disrupted by the communist state policies aimed to industrialize and urbanize Romania. In this context, at the national level, a number of small towns emerged, many of them being mono-industrial. Their support lasted until the fall of communism. The transition to the rigors of the market economy has affected these small towns, triggering forms of urban restructuring and finally an urban decline process with the diminishing of the urban functions. Within Beiuș Land, the most important changes triggered by the communist policies were the birth of the three new towns (two of them being the exponents of the urbanization policy and the accelerated industrialization) besides the traditional urban centre – the town of Beiuș.

The present paper looks at the post communist functional changes that occurred into the four small towns in Beiuș Land from economic, socio-cultural and residential point of view. The working method relies on a series of indicators showing the number of enterprises, the professional structure of the population, the share of population occupied in different work sectors, the presence of socio-cultural buildings and the ratio of house building, between 1990 and 2011. The analysis of the mentioned indicators for the given period will highlight the major changes that occurred in the four towns and how they adapted to the market economy and to the changes that the Romanian economical system faced after 1990.

Keywords: *small towns, Beiuș Land, post-communism, functional changes.*

1. INTRODUCTION

The most frequently used criterion to delimit groups of cities is based on the population size. Population is usually the most used criteria to separate small towns from other categories of the urban network and identifying them as a distinct category of urban system (Brennan *et al.*, 2005). Besides the criterion of the number of people which identify small towns, there is a qualitative method for identifying and defining small towns, which emphasizes on the significance and the role they can play within the adjacent territory through the functions they perform. From this perspective, centrality

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is the most used criterion to define cities, identifying in this way centers with more or less functional importance for the adjacent territory (ESPON, 2006). The principle of centrality based on the theory of central places developed by Walter Christaller in 1933 formalized the relationship between a city's population, the specialization degree and the number and range of functions fulfilled by cities. By this method of identification, a small town is considered a place where a number of economic, cultural, political, administrative and financial functions are concentrated and fulfilled with effects on the surrounding territory. A combination of these functions results in a higher importance of the city in the territory. This way of defining the city emphasizes the important role of cities in the functional pattern of the national territory, and especially in their area of influence. Smaller towns act as centers for providing services (public or private) for the surrounding rural areas (Courtney and Errington, 2003).

The urban development affects and influences the unequal spatial development (Kim, 2008), on the one hand by urban specialization in different industries. On the other hand, the size distribution of cities in a region is essential for its development. If the towns of the region are small and evenly distributed, urbanization will have a minor effect on the regional disparities, whereas when towns differ in size, it usually happens that there are spatial disparities in regional development. Two types of theories explain the role of small towns in the rural development. Firstly, the modernization theory, which suggests that small towns are centers that disseminate innovation and encourage modernization (Săgeată, 2001) in rural areas. Secondly, the dependency theory suggests that small towns contribute to the impoverishment of the rural population especially by exploiting its natural and human resources (Tacoli, 2003). The middle or intermediate hypothesis implies the need to take into account, on the one hand the uniqueness of small towns and on the other hand the distinctiveness of the region where they are located (Tacoli, 1998). It was considered that the development of small towns can influence the change of the rural population (Zamfir and Brăghină, 2000) from the surrounding countryside by providing employment in non-agricultural activities (Zamfir, 2005), thus having an important role in the decrease of the migration pressure on larger towns.

The factors and forces responsible for the growth of small towns are: the location, the types and resources of their area of influence, the infrastructure and the quality of labor resources, the historical evolution and the administrative status. Besides these factors related to small towns, they are also affected by exogenous factors like national or regional economic development, macro-territorial development trends, regional decline or regional attractiveness (UNCRD, 1983). Hinterland richness in terms of natural resources (agriculture, minerals etc.) influences the economic performance of small towns. It is well-known that the development of small urban centers takes into account the development potential of their rural area of influence (Vârdol, 2009). Key elements in the development of small towns are represented by the historical, cultural, political and religious legacy.

Due to the different political and socio-economic context, Romanian small towns present certain specific peculiarities which are reflected in their role played in the territory. During post-communism, the Romanian society went through profound demographic, economic, social and cultural changes. These mutations occurred in both rural and urban

areas, left their mark on the functionality of the environment. Contrary to the large and medium size cities tributary to the communist past, the small towns in Romania are facing serious and generalized issues, represented firstly by the economic restructuring, followed by demographic decline, labor migration and, ultimately by reduced urban functions.

All these specific post-communist problems of Romanian small towns, caught the attention of specialists from various fields, being tackled in a number of studies conducted mainly by geographers and sociologists. It is worth mentioning the studies elaborated by Iașu and Muntele (2001), Zamfir (2007), Erdeli and Dumitrescu (2007), Zamfir, Talângă and Stoica (2009), Pascariu (2010), Camară (2011), Filimon et al. (2011), Humă and Chiriac (2012) etc. The present study is enrolled in the same vein, aiming at the analysis of the functional changes occurred during the post-communist period in the four small towns of Beiuș area.

As it is well known, small towns are considered the link between rural and urban areas (Ianoș, 1987), which is true both for the communist era and the present. Specifically, the role of small towns in the adjacent territory, besides their demographic size and their position in territory, is derived from the functions they perform, which gives them the status of "relays in the transmission of urban characteristics in rural areas" (Ianoș, 1987, 46), but without claiming exclusiveness of this action.

In order to render the functional changes occurred within Beiuș Land small towns, we analyzed the economic, socio-cultural and residential function changes. The analysis carried out for Beiuș, Nucet, Ștei and Vașcău towns focused on the following indicators: the number of economic units, the structure of the active population by activity branches, the level of endowment with socio-cultural units (to render the economic and socio-cultural function changes) and the degree of housing renewal (to render the changes in the residential function). The period of analysis covers 20 years between 1990 and 2010. Statistical information used in this paper was taken from the databases of the four small towns (BDL) and the censuses of 1992 and 2002 provided by Bihor County Statistics.

2. COMMUNIST LEGACY IN THE FUNCTIONAL PROFILE OF SMALL TOWNS

Until the end of World War II, the evolution of Romanian towns analyzed through spatial planning had not suffered major influences, their development following a natural course. Thus, the settlements were developed mostly based on the actual capitalization of local potential (Ghiorghiță, 2002), not taking into account that the contribution of local development can induce regional and national development. This fact had triggered, especially in rural areas, the emergence of undefined structures, textures and shapes, which later led to complex problems in systematization, in accordance with the newly adopted legislation. The following period was characterized by the decisive intervention of the communist state, where the administrative organization was correlated with active economic policies imposed from the top down, with a strong impact on regional development. Planning in communist Romania was imposed by a suitable form of the New Economic Policy (NEP) from the Soviet Union, economic development being based on five-year plans (Vela, 1986). It was the moment when "the stage of building the multilaterally developed socialist society" started. The five-

year plan foresaw huge investments in industry, in large economic projects, but of a doubtful economic value. The emphasis was on the siderurgy, petrochemical, chemical industry and machine construction industry (Dobrescu *et al.*, 2012). The existing rural-urban gap in the early stage of communism led to the establishment of immediate urbanization policies at large scale. In 1967, the Central Commission for Village Systematization presented the prototype of the future Romanian rural settlements: each village was going to have one or more schools, a public library and a house of culture, cinema, medical and maternity clinic, a public bath and a network of shops that was to ensure the supply of consumer goods for the residents. In parallel, intellectuals were supposed to be brought in these communes to decide on a medium term the transformation of these communes into semi-urban settlements. Rural systematization foresaw the replacement of households from small and scattered villages (considered as lacking development perspectives) being concentrated in the more compact communes. Hundreds of communes selected across the country were to be converted into agro-industrial centers with urban status. Their inhabitants (in number of at least 5000 in each town) were to be removed from their individual homes in collective dwellings (blocks) with several floors creating a high density of the population. Inside these localities, the administrative and political offices were supposed to be grouped in the center of the settlement. Industrial sites, stores, schools, hospitals and other facilities were supposed to be constructed in these areas serving the surrounding villages within a radius of up to 20 km (Dumitrescu, 2008). Since the early 1980s the systematization became part of annual and five-year plans.

Concerning the urban framework there are three major phases of the regional policies that brought a metamorphosis on the Romanian urban space:

- The first stage corresponds to the 1950 administrative-territorial division (28 regions including rayons, cities and towns) after an "imported" model (Forman *et al.*, 2011). This division had assumed the appearance of regional small centers which had difficulties in exercising their administrative and socio-economic functions.

- The second stage includes the reduction of the number of regions to 16. During this period, there had been important changes, towards the economic and social enhancement of regional seats and rayon centers which developed technical infrastructure and their own institutions resulting in a lesser importance of the other urban centers.

- The third stage is represented by the administrative division of the territory in smaller units, the traditional counties, by Law no. 2/1968 (initially 39 counties, and then, after the changes in 1981, 41 counties). This meant the descent of the industrialization process from large urban areas to middle and lower urban entities. A number of new county seats (which previously had not had a significant industry) faced a major development. The economic development led to an increased urbanization process. In 1975 the urban population increased by 335% from 1930, compared with the increase of 51% of the total population (Forman *et al.*, 2011). As a result of industrialization, urbanization was amplified through an increase of the existing cities due to the migration from rural to urban (Lăzărescu, 1977). Also, industrialization triggered the emergence of new cities, other cities resulting from the transformation of villages that had been developed economically. The setting up of suburban communes, the way in

which they were administratively subordinated to towns, triggered the strengthening of the relations between these units and the polarizing unit until the merging of the periurban areas with cities.

3. THE POST COMMUNIST PERIOD IN THE CONTEXT OF FUNCTIONAL CHANGES OF SMALL TOWNS

The end of the planned urbanization and regional redistribution policies has increased the polarization process. These polarization processes are stimulated by new industrial cycles of de-industrialization and stagnation (Musil, 1993). The end of regional and urban redistribution policies determined the increase of decentralization process and the dependence of the cities on their economic and social potential. Economic basis, the position within the region and the access to the main communication routes of small towns resulted in their differential evolution based on the ability to adapt to the new opportunities offered by the transition to a market economy. The polarization processes that occurred were more intense within these towns. The evolution of towns followed a specific post-industrial period trend of urban systems formation corresponding to the last phase of the industrial development characterized by high energy consumption towards a rectification process. The urban structures created by the forced urbanization process characterized by large industrial units based on limited local resources and imported labor force underwent a shock in the economic transition, being unable to adapt to the market economy. Lack of identity emphasizes the drift status, solutions being found in state policies.

The interdependence relations between employment, places, services and infrastructure, respectively, the direct link between the closing of the major industrial units (especially mining) and local living standards (Sheldon *et al.*, 2002) have prompted the authorities to promote socio-economic development policies in order to improve the situation of the areas affected by industrial and mining restructuring, including them in a sensitive category of "disadvantaged areas". The beginning of negotiations with the European Union towards the integration into the community space has contributed greatly to the reorientation of national territorial development policies by adopting measures of decentralization and regional development (Development Regions facilitated by Law no. 151/1998). Accession to the European Community space imposed adherence to rules and principles of sustainable development set by the European Union. In this context, cities, particularly smaller ones, have access to funding sources (Structural Funds) and the possibility of shaping development strategies and policies based on human and natural resources that they have. Nevertheless, the articulation of the legal and institutional framework, or operational tools such as policies, strategies and programs in a unified approach that respects both national distinctiveness and European policy framing seems to be difficult.

4. FUNCTIONAL CHANGES IN THE SMALL TOWNS OF BEIUȘ LAND

Beiuș Land, located in the South-East of Bihor County, is part of the "land" type area category, this being a geographic region of deep authenticity specific to Romania (Cocean, 1997, Filimon, 2012). The urban system of this region is represented by the

towns of Beiuș, Ștei, Vașcău and Nucet. If the first city has a long and continuous urban tradition, not the same can be said about the other three, which are the effects of central policies of forced urbanization and industrialization. If until the setting up of the communist regime the regional convergence axes were directed towards Beiuș, after several external interventions in the natural course of regional development, the urban hierarchy was disturbed. The gravity center moved temporary from Beiuș to Ștei - Vașcău - Nucet (fig. 1). In this context, a series of functional changes took place in the small towns of Beiuș Land.

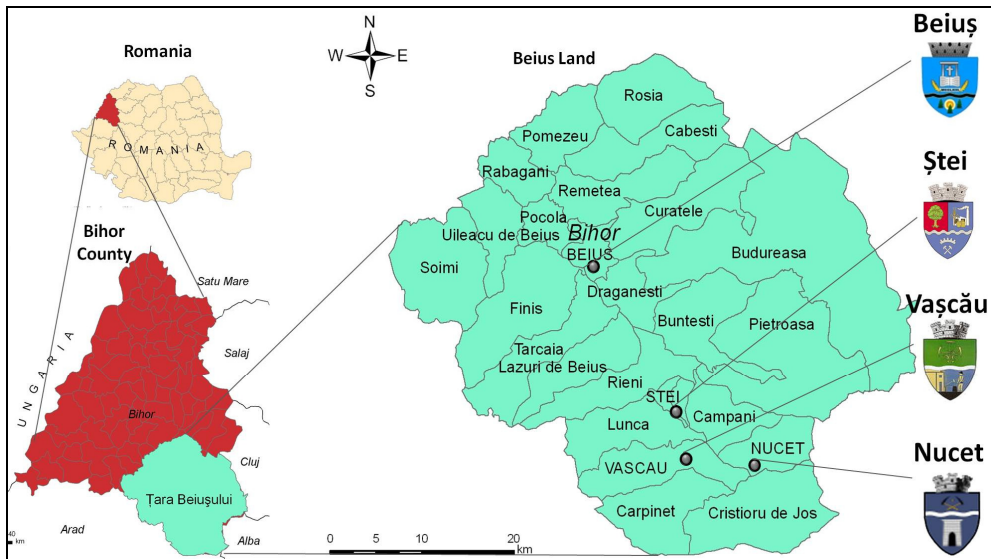


Fig. 1. Beiuș Land. Location of urban settlements

Economic changes

The largest changes occurred in the post communist period affected the economy. The difficulty to adapt to the rigors of market economy of the old economic units was felt acutely. Large economic units closed their doors, the vacuum created and the need of a fast recalibration resulted in the emergence of new economic units. Even if the number of industrial units increased in the post-communism years, the lack of entrepreneurial experience correlated with the lack of resources and avoidance of major investments, made that many of these units did not contribute significantly to the economic development of towns and did not compensate for the disappearance of old economic structures.

The dynamics of the *number of economic units* in the post-communist period reveals a continuous increase in all four studied towns. Beiuș has the highest economic growth in number of economic units, rising from 135 in 1990 to 404 economic units in 2005 and 591 in 2011. Ștei, from 68 economic units in 1990, reached 248 in 2005 and 332 in 2011. Nucet town has increased from 18 economic units in 1990 to 37 in 2005 and 63 in 2011. It can be noted that Ștei-Nucet-Drăgănești as a disadvantaged area had no

major impact on promoting the installation of new economic units in the case of Nucet. On the contrary, in Ștei the disadvantaged area status triggered the installation of powerful companies with a major impact in transforming the profile of this area. Vașcău presents a unique situation with a stationary character. The number of economic units in 2005 was the same as in 1990, in recent years their number increasing to 57.

The professional structure of the population for the four towns reveals a continuous decrease of the share of active population from the total population. Beiuș is the town that has the most stable evolution from this perspective. Thus, if in 1990, 57.65% of the population was active, in 2005 its share was 46.15 and decreased to 44.89 in 2010. In Nucet in the first year of the establishment of democracy and market liberalization (1990), the share of the active population from the total population, was only 19.43. Furthermore, this indicator underwent a slow increase at 21.16 % in 2005 and 21.71 % in 2010.

Ștei registered a significant decrease of the active population during this period of transition, moving from a share of 81.21% of active population to 65% in 2005 and almost at half by 2010, when the share of active population was 39.47%. Another city that has experienced a continuous decrease in the active population is Vașcău, from 35.49% in 1990 to 15.10% in 2005 and only 11.87% in 2010.

There are a number of factors that led to these changes in the occupational structure. On the one hand, the reorganization of economic units with large number of employees and, on the other side, the lack of urban attractiveness. Regarding the economic profile of the towns of Beiuș Land, the economic changes which had occurred in recent years can be seen by analyzing *the structure of the employed population by sector*. Depending on the economic distinctiveness of urban areas can be highlighted a number of urban types based on the economic profile (fig. 2).

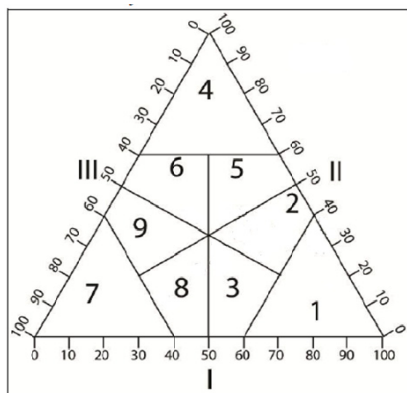


Fig. 2. I, II, III – functional types; (1. agrarian, 2. agrarian-industrial, 3. agrarian-service, 4. industrial, 5. industrially-agrarian, 6. industrially-service, 7. service, 8. service-agrarian, 9. service-industrial) (Lukić et al., 2012)

For the studied towns, the situation varies from case to case being otherwise under the influence of different exogenous factors which have acted on them with a different intensity. Resilience and adaptation processes are those which set their print at present.

In the early 1990s, Beiuș had a dominant industrial profile with a low participation of the service component. *The industrial armour* dressed in the communist period by a town with a long urban and commercial tradition (in 1451 it was declared *oppidum*) was easily replaced by a *mantle* represented by economic units with activities in services. Nowadays, Beiuș is a town with an economic profile characterized by numerous activities in providing services.

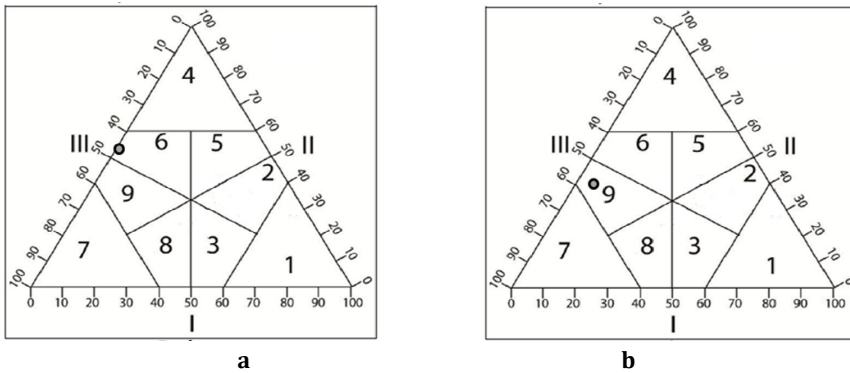


Fig. 3a. Beiuș - economic functional type in 1990 and **3b.** Beiuș - economic functional type in 2010.

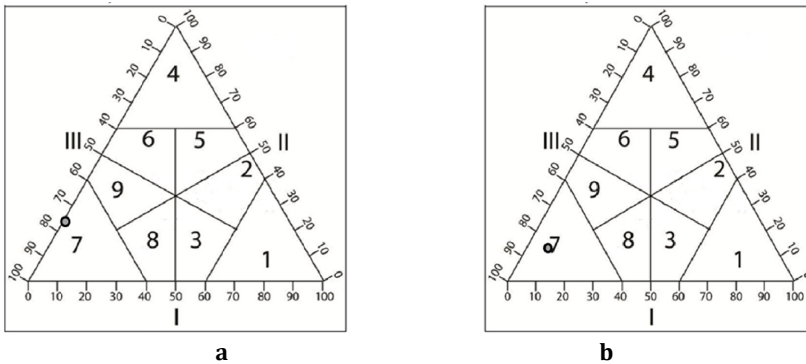


Fig. 4a. Nucet - economic functional type in 1990 and **4b.** Nucet - economic functional type in 2010

The new town created during the Soviet occupation was developed around the mining activity and related industrial branches. After the fall of communism and the shift to market economy, the communist overdeveloped industrial structure, dependent on one another and with low production, faced difficulties to adjust. Most of the economic units diminished their activity, the social consequences being severe. The local economy diversified due to the new private economic initiatives. 82% of these have a commercial profile, only 15% provide services and 3% has industrial activity. It is obvious that twenty years after the fall of communism, the local economy did not manage to diversify its profile and outrun the difficulties of monospecialization, Nucet and the two other villages remaining mining communities which lost their identity without constructing a new one (Filimon *et al.*, 2011).

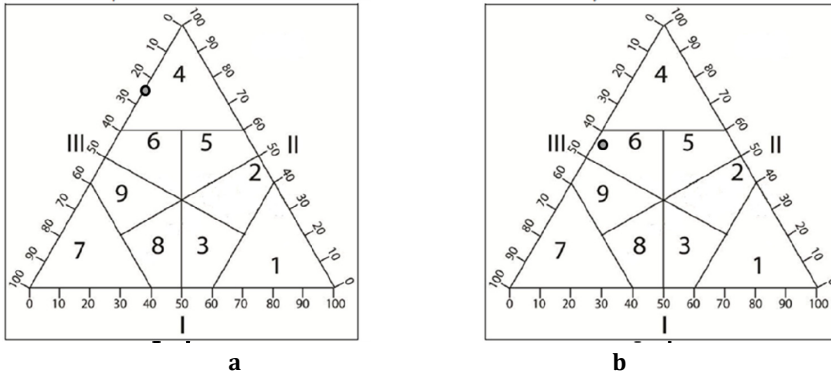


Fig. 5a. Ștei - economic functional type in 1990 and
5b. Ștei - economic functional type in 2010

The town planned in Moscow and built by the Russians owes its existence to the forced industrialization policies. In the early 1990s the town had a mono-industrial profile, where about 75.5% of the total workforce operated in the industry. The reduction and finally closure of these industrial entities created new economic opportunities. In 1998 Ștei-Nucet disadvantaged area was established (Emergency Decree no. 24/1998, modified by Law no.20/1999), by including the towns of Ștei, Nucet and Drăgănești commune, which were to benefit from a series of facilities to attract potential investors (Filimon *et al.*, 2012). The newly-established industrial platform changed the economic profile of the town, much more because the new economic units were accompanied by connected activities. The tertiarization process is obvious, respectively the transition from a mono-industrial town to an industrial-services type town.

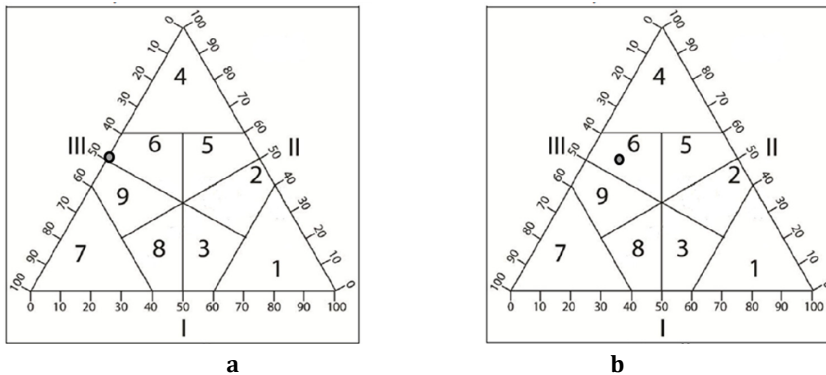


Fig. 6a. Vașcău - economic functional type in 1990 and
6b. Vașcău - economic functional type in 2010

Vașcău maintained the same industrially-service profile throughout the entire post-communist period, having an alternation of population employed in the tertiary sector. The share of the population employed ranged from 49.5% in 1990 to 57.6% in 1991 and back to 35.5 % in 1992. This highlights the existence of instability in Vașcău

on a reduced temporal scale. The oscillatory evolution continues throughout this period. In 1998 the share of population employed in the tertiary sector reached the maximum (77%), coinciding with the year of the declaration of the disadvantaged area Ștei - Nucet - Drăgănești.

Socio-cultural changes

The changes in the socio-cultural composition of the towns are analyzed according to their level of endowment with social equipments: schools, universities, libraries, museums, cinema, culture, theaters, philharmonic, hospitals, religious buildings and spaces designed for recreation.

The town, regardless of its size, is a generator of culture, and tradition plays an important role in this sense. Taking into account this tradition and how these towns earned their urban status, with the exception of Beiuș, the cultural function did not receive a special attention from the state authorities, therefore no major differences in the current period compared to the communist period were noticed.

During the communist period, this function was achieved through organized action in the House of Culture, cultural associations, cinemas. Immediately, after the change of the political regime in Romania, due to the wider range access to television services, the first to suffer were the cinemas. They have disappeared from the sphere of recreational activities offered by these towns. The activities of the House of Culture and cultural associations were reduced significantly in the post-communist period due to the lack of the state external intervention.

In the educational field, unlike the communist period, changes were not particularly spectacular. The number of schools remained the same: five high schools, three in Beiuș and two in Ștei. The only changes that occurred consist in the reorientation of these high schools from the industrial profile towards a human, pedagogical profile. A significant change is represented by the presence of higher education institutions, present in Beiuș, by a branch of the University of Oradea, specialized in teaching and engineering.

Socio-cultural institutions in Beiuș Land small towns

Table 1

City	High schools		Museums		Hospitals		Libraries		House of Culture	
	1990	2011	1990	2011	1990	2011	1990	2011	1990	2011
Beiuș	3	3	1	1	1	1	3	1	2	-
Nucet	-	-	-	-	1	1	2	1	1	-
Ștei	2	2	-	-	2	1	2	1	1	-
Vaşcău	-	-	-	-	-	-	1	1	1	-

Source: BDL, 1990-2010

From socio-cultural and recreational point of view, the biggest changes occur at the individual level. This can be noticed in the way in which the towns have adapted to the new demands of the people. Freedom of religious expression, limited in the communist period, generated the emergence of new religious communities to which the towns had to answer. The answer comes through the emergence of new urban religious buildings belonging to different denominations (Baptist, Pentecostal etc.).

The changes in the cultural recreational range of the urban environment are the result of changes in recreational behavior of the individual. Thus, it is a shift towards activities considered degrading or even banned during the communist era, like gambling, discos, night clubs etc.

In terms of changes occurred in the health-service system, it should be noted that during communism there were a total of four hospital units, one in Beiuș, one in Nucet and two in Ștei. Following the restructuring that took place in the Romanian health system, hospitals even closed. The number of hospitals decreased to three, one hospital in each of the mentioned towns. Vașcău has never had a hospital. The most important changes in health care system of the post-communist period are represented by the emergence of private medical establishments such as dental offices, medical offices and specialized pharmacies.

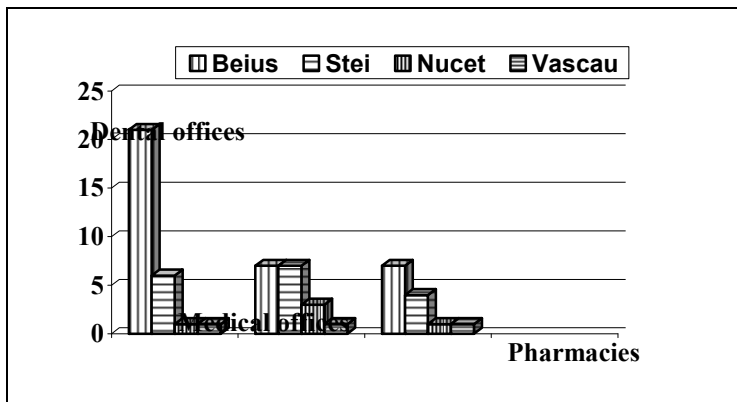


Fig. 7. Medical and connected services in the small towns of Beiuș Land
source: BDL, 1990-2010

In the four studied towns, there is a total of 29 dental offices, 11 pharmacies and 18 private family medicine offices. Their distribution in the four towns shows their higher concentration in Beiuș. In Beiuș and Ștei there are also ambulance services, providing service to the entire Beiuș Land.

Changes in the residential function

The residential function or the ability to provide a decent standard of living to its inhabitants is related to the attractiveness of towns. To highlight the changes occurred in the post-communist period, we analyzed the evolution of the number of dwellings from 1990 to 2011. This trend overlaps a general trend of population decline.

The number of new dwellings in the four analyzed towns for the entire period is 747, or an average of 34 dwellings/year. At the town level, Beiuș stands out with 375 dwellings, ie 17 dwellings/year followed by Nucet with 258 dwellings (12 dwellings/year) and Ștei with 9 dwellings/year (197 new dwellings). Vașcău registered a decrease of housing for the entire period (-73 dwellings), respectively - 4 dwellings/year.

The spatial effects of these functional changes in the small towns of Beiuș Land are consequential in the rural area that they polarize and influence. The emergence and intensification of metropolisation processes caused a weakening and even limitation of some urban functions of the small towns in the favor of Oradea, the county seat. The high quality services offered by the city of Oradea induces an increase in the urban attractiveness, influencing regional orientations.

5. CONCLUSIONS

The small towns of Beiuș Land represent the skeleton on which the regional development of this territory must be built. Although these towns were influenced by the same effects of the transition from centrally planned economy to the economic development generated by local mechanisms, the adaptive course was different. This difference is given by the existence or not of an urban tradition. If Beiuș has a long urban tradition, Ștei with the newly created elitist urban character managed to draw a certain urban identity. In Vașcău and Nucet, the urban character is entirely missing, having a predominantly rural character. In these towns the link between past, present and future is extremely weak, their urban image being the most affected. The identity of an urban space is the result of the historical past. In this context, one should take into account Beiuș with a modest urban dynamics but which has a high capitalization potential nourished by the legacy of the past, especially in the cultural field. The other three towns owe their existence as urban areas to the central forced policies. Their short period of existence and the diversity of origin of the inhabitants created an unstable community cohesion linked to the industry and implicitly to the created jobs there. With the disappearance of the communist industrial units, the articulation between individuals, territory and identity has also disappeared. Slow economic recalibration processes and resilience in the case of Beiuș and adaptation in the case of the other three towns are obvious.

In order to adapt to the new market economy rigors after the end of the communist regime, the small towns of Beiuș Land suffered major changes. The most visible changes are in the economical profile of the four small towns, which directly or indirectly affected their socio-cultural and residential functions. Functional changes are more obvious in the three towns emerged during the communist era which highlight severe urban decline signs. Contrarily, due to its urban potential enhanced during the history through its commercial status gained already in the Middle Ages, the town of Beiuș presents nowadays a stable situation. The functional changes registered in this town offer more competitive opportunities and a wider polarizing area in the region.

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CLUJ-NAPOCA URBAN GROWTH FROM 1250 TO 2012. A GEOGRAPHICAL INFORMATION SYSTEM APPROACH

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ABSTRACT. – **Cluj-Napoca Urban Growth from 1250 to 2012. A Geographical Information System Approach.** This paper presents a study of urban growth in Cluj-Napoca city, Romania, by using Geographical Information Systems (GIS), historical maps, historical evidences and General Urbanistic Plans. The study explores the temporal and spatial characteristics of urban expansion from 1250 to 2012, and population dynamic from 1450 to 2012. Overlapping the layers obtained by digitizing the cartographic materials, a map representing Cluj-Napoca urban growth dynamics for 1250- 2012 period was realized. The economic development, the migration flows from village to city and other activities, have resulted in the increase of urbanization and therefore in substantial changes in the population structure.

Keywords: *urban growth, Geographical Information System, Cluj-Napoca, historical map, historical evidences.*

1. INTRODUCTION

The spatial configuration and the dynamics of urban growth are important topics of analysis in the contemporary studies.

The study of urban growth is “*a branch of urban geography that concentrates on cities and towns in terms of their physical and demographic expansion*” (A.K. Knowles, 2008). In the recent decades, analysis of the urban growth from various perspectives has become an essentially performed operation for many reasons. Geographers are becoming interested in temporal uncertainty as part of the broader interest in developing a form of GIS that can analyze and represent change over time as effectively as current systems handle change over space.

Urban growth is “*a dynamic process that alters urban form*” (N. Schwarz, 2010), is a spatial and demographic process and refers “*to the increased importance of towns and cities as a concentration of population within a particular economy and society*” (B. Bhatta, 2010).

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Maps record the geographical information that is fundamental to reconstruct past places, whether states, regions or towns. Historical maps often hold information retained by no other written sources, such as places, boundaries, and physical features that have been modified or erased by modern development (D. Rumsey and M. Williams, 2002).

2. STUDY AREA

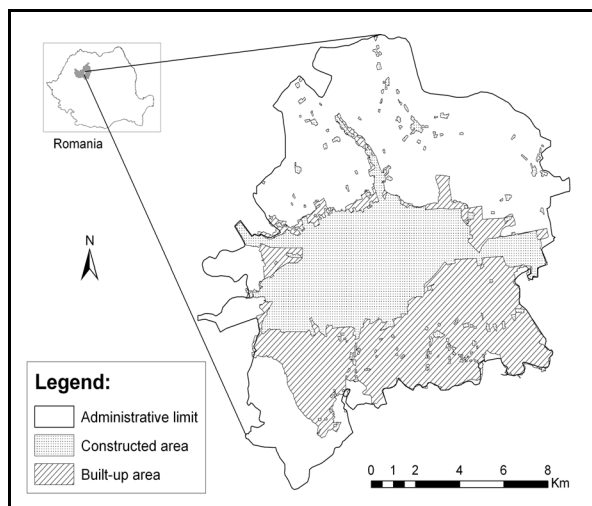


Fig. 1. Location of the study area.

Cluj-Napoca City, county seat of Cluj County, is the most important urban center of Transylvania.

Cluj-Napoca is located within Someșul Mic Corridor, at the intersection of three major geographical units: the Transylvanian Plain, the Someș Plateau and the Apuseni Mountains, at an average altitude of 360 meters and intersected by the parallel of 46°46' North latitude and the meridian of 23°36' East longitude (Fig. 1).

3. MATERIAL AND METHOD

3. 1. Data


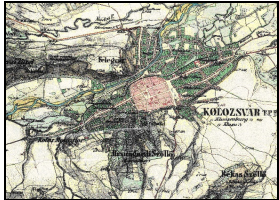

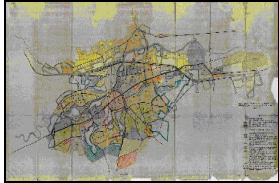

For this study, historical maps, historical data and two General Urbanistic Plans were collected in order to evaluate the temporal and spatial characteristics of urban expansion from 1250 to 2012. Population data were obtained from various literature sources and Statistical Yearbook of Romania.

The cartographic materials used in this study are listed in Table 1.

List of the cartographic materials used in this research

Table 1

Data type	Year	Producer / provider	Process	Output
Historical evidences	1250	-	Establishing the limits of the first medieval enclosure	Layer with boundary of built-up area
Historical evidences	1450	-	Establishing the limits of the old fortress	Layer with boundary of built-up area

Data type	Year	Producer / provider	Process	Output
Historical map (Josephin map) 	1763	The first Habsburg military topographic campaign	Georeferencing, digitization	Layer with boundary of built-up area
Historical map (Franciscan map) 	1853	The second Habsburg military topographic campaign	Georeferencing, digitization	Layer with boundary of built-up area
Historical map (Neue Aufnahme) 	1869	The third Habsburg military topographic campaign	Georeferencing, digitization	Layer with boundary of built-up area
General Urbanistic Plan 	1976-1998	Cluj-Napoca City Hall	Georeferencing, digitization	Layer with boundary of built-up area
General Urbanistic Plan 	1998-2011	Cluj-Napoca City Hall	Georeferencing, digitization	Layer with boundary of built-up area

Historical records have allowed the outlining of the limits for the first medieval enclosure of Cluj in 1250 (fig. 2) and the limits of the old fortress of Cluj in 1450 (fig. 3).

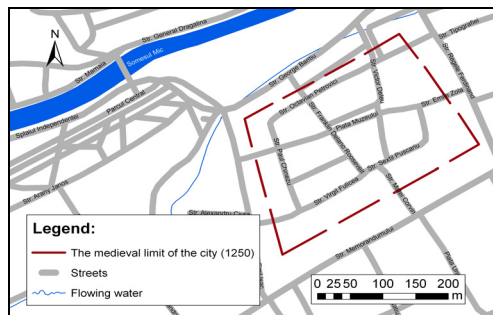


Fig. 2. The medieval limit of the city.

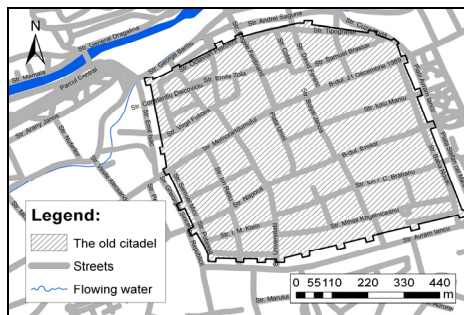


Fig. 3. The limits of the old fortress of Cluj.

3. 2. Map processing

The sprawling problem of Romanian cities has become critical for the last two decades and is important because of the major impacts that are obvious in increased energy and land consumption. Thus, urban sprawl produces many adverse impacts that have direct effects on the quality of life for people living in urban area (Muntean et al., 2011).

The rapid spread of urban space and its environmental challenges require precise mapping techniques to represent complex earth surface features more accurately. Some mapping approaches (GIS processing) can be used to assess urban land use and urban sprawl (Thapa, Murayama, 2009).

For this study, GIS methods and techniques were used. GIS allows one to visualize the geographic patterns embedded in historical evidence, examine difference at different scales, aggregate data from smaller to larger units, and integrate material from textual, tabular, cartographic, and visual sources, provided that they share a common geographical location.

Use of historical maps to extract the boundaries of the city to investigate patterns of urban expansion is relatively simple and can collect information from the pre-satellite ages (Xiao et al., 2006).

To query or measure spatial relationships between features, they must be lifted of historical maps and made into vector GIS layers. This is done by digitizing map features as polygons. Integrating historical maps in GIS to analyze the spatial information they contain, or to layer them with other spatial data, required that the maps be georeferenced.

The maps of different historical periods (1763, 1853, 1869), and the General Urbanistic Plans were georeferenced and digitalized and put into GIS. The maps were geometrically inter-matched and converted to Stereo 1970 map projection.

4. RESULTS AND DISCUSSIONS

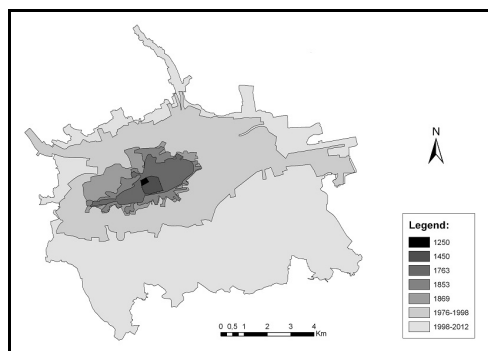


Fig. 4. Cluj-Napoca urban growth.

A map representing Cluj-Napoca urban growth dynamics for 1250-2012 period was realized using ArcGIS 9.3.1, by overlapping the layers obtained by digitizing the above-mentioned cartographic materials (Fig. 4).

Table 2 presents the surface and population dynamics of the city located along Someșul Mic River.

Surface and population dynamics of Cluj Napoca between 1250 and 2012

Table 2

	Year	Surface (km ²)	Nb. inhabitants
Cluj-Napoca	1250	0,06	-
	1450	0,53	6000 ³
	1763	4,05	7500 ¹
	1853	6,31	19612 ⁴
	1869	10,01	3283
	1976-1998	39,61	262421 ⁵ - 332498 ⁶
	1998-2012	93,32	332498 ⁴ - 314513 ⁷

In Cluj-Napoca, the residential function of the city, directly related to the enhancement of the industrial and business functions, led to the perpetual development of the settlement situated alongside the riverbank of Someșul Mic River (Muntean et al., 2011).

Figure 5 shows that after the construction of the first fortified enclosure of Cluj (1250), the area of the city has rapidly increased from about 0.06 km² to 10 km² in 1869 reaching approximately 93 km² in 2012.

Population dynamics followed the same positive trend, from 6000 inhabitants in 1450 to 332,498 inhabitants in 1998 reaching to 314,513 inhabitants in 2012 (Fig. 6). Population data for 1250 are not available.

³ According to Pascu, Șt., 1974. *Istoria Clujului. Consiliul Popular al Municipiului Cluj*, 576 p.

⁴ According to Rotariu, T., (coord.), Semeniuc, M., Mezei, E., 1996. *Recensământul din 1850: Transilvania, Edit. Staff*.

⁵ According to „Anuarul Statistic al Republicii Socialiste România, Direcția Centrală de Statistică – 1977”.

⁶ According to „Anuarul Statistic al României, Comisia Națională pentru Statistică – 1999”.

⁷ According to „Recensământul Populației și al Locuințelor din 2011”.

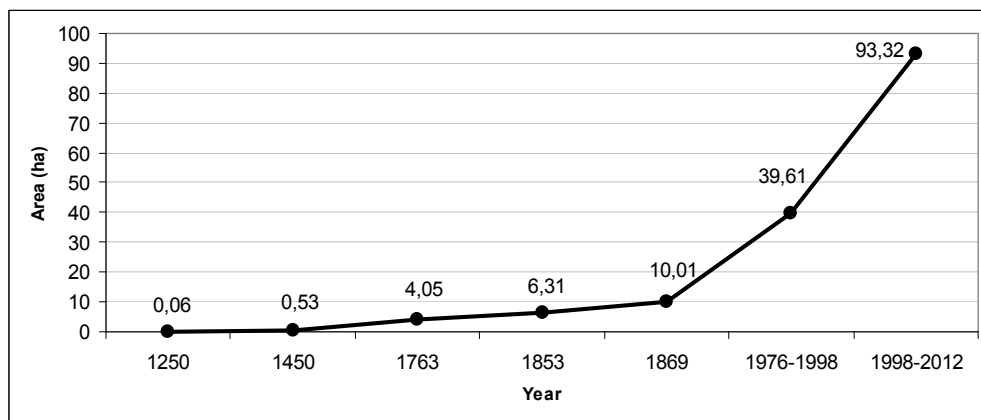


Fig. 5. Area dynamics for Cluj-Napoca between 1250 and 2012.

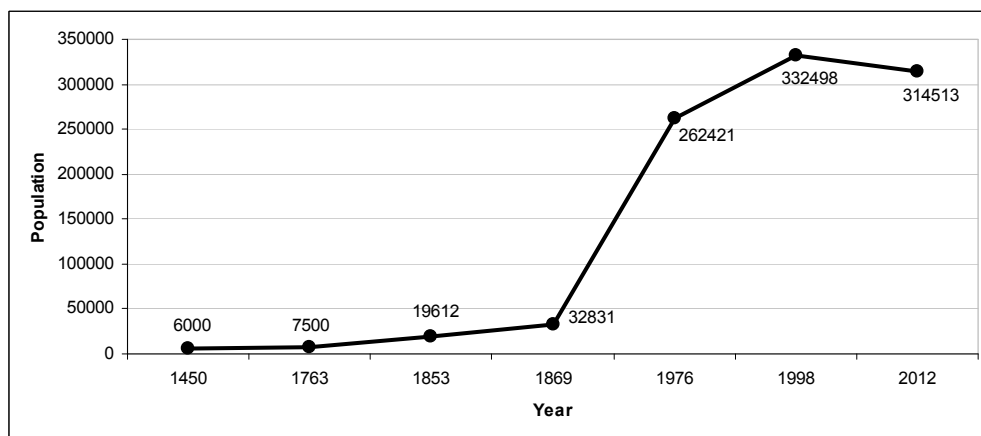


Fig. 6. Population dynamics for Cluj Napoca between 1450-2012.

Starting with the end of the 19th century, Cluj-Napoca City had a rapid growth of the urban area and an accentuated dynamic of its population.

In 1895, the settlement called Mănăştur became part of the city and then, in the inter-war period, other neighbourhoods (Andrei Mureşanu, Grigorescu, Gruia, Dâmbul Rotund, Iris etc) started to develop. After World War II, Someşeni village was also added to Cluj-Napoca City.

The 1960-1990 period represents one of the most important stages of the city's development, because during this time Gheorgheni, Grigorescu, Mănăştur, Zorilor and Mărăşti neighbourhoods were built. After 2000, tens of real-estate projects began to develop, concerning particularly the peripheral areas of Cluj-Napoca.

In Cluj-Napoca, as in most Romanian cities, urban growth bears the conjunctural imprint determined by the existence of a decisional politics exposed to economic and

political clientelism. This situation encouraged the "uncontrolled urbanization", which has multiple facets in Cluj-Napoca. The following can be noted in this regard:

- the abusive occupation of the urban space by extending building on unencumbered land instead of the establishment of sound policies for recovery and reconstruction of already-built degraded areas, such as the industrial brownfield sites; the extension of residential areas on geotechnically vulnerable land;
- occupation of green spaces in the existing built-up area. The extension of the built-up area, although increased the area of green spaces, will lead to their destruction if the current urban development policies continue;
- the improvised nature of urbanization in new neighborhoods (areas built without prior planning of the road network, with no access to public utilities etc.).

Of course, the term "uncontrolled urbanization" should be understood in terms of the way that urban development based on speculative and/or scientifically unsubstantiated decisions affects the base interests of the community in the long term. The term is appropriate as "factors" and "actors" are "behind" the decisions affecting the potential and development prospects of the city, including also its environmental state. They undoubtedly exert some kind of control which serves, however, only personal and group interests.

5. CONCLUSIONS

Cluj-Napoca City flows perceptibly across municipal boundaries and this process is at different stages of development in different new residential areas. Thus, the responsibility for land use management remains divided between local administration and this fragmentation of urban management, frequently exacerbated by the political tensions, may lead to incoherent land use planning. In this context, the mixture of forces include socio-economic trends such as the means of individual housing preferences, transportation, the price of land, demographic trends, cultural traditions and environmental constraints, the attractiveness of existing "green areas", and the application of land use planning policies at local scale.

Morphological measurement of urban development is important for the study of urban development. Urban planners and researchers are often concerned with the change in size, shape, and configuration of built-up areas. The measurement of the urban form can provide a more systematic analysis of the relationship between urban form and process.

The study area is characterized by a highly authentic human fingerprint and a space-time dynamics marked by many changes and evolutionary bifurcations. Regarding the territorial dynamics of the urban system, the 1250-2012 period reveals a continuous development and growth of the built area and the population.

The economic development of Cluj-Napoca City, the migration flows from village to city generated by the progress of industry and other activities (transport, services, commerce, etc.), the extension of its boundaries by incorporating adjacent communities, have resulted in the increase of urbanization and therefore in substantial changes in the population structure.

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THE GIS-BASED ROAD DISTANCE AND TIME CONNECTIVITY INDEX OF THE SETTLEMENTS WITHIN THE WEST REGION OF ROMANIA

R. RUSU¹, T. MAN¹, C. MOLDOVAN¹

ABSTRACT. – **The GIS-Based Road Distance and Time Connectivity Index of the Settlements within the West Region of Romania.** This study is based on previous approaches to the subject of connectivity index (R. Rusu, 2007; R. Rusu, 2008) and is organically linked to the work of R. Rusu, T. Man and C. Moldovan (2013) which introduced the road distance connectivity index for the settlements of Banat. While preserving the above-mentioned index and the methodology to calculate it, this study extends the research to the whole West Region of Romania and sets the methodological framework for calculating a road time connectivity index, based on driving times from each settlement to the nearest central places of every rank. Although the values of the road time connectivity index would in fact depend more on various factors that have an impact on driving speed, it is a more reliable instrument to calculate connectivity. Settlements close to motorway entries/exits or located along or near national roads will have a better value of the time-based connectivity index than of the distance-based connectivity index. Both distance-based and time-based road connectivity indexes may represent useful tools in the planning and management of infrastructure projects, in development strategies meant to reduce territorial disparities, as well as in regional and local planning.

Keywords: *West Region of Romania, road distance connectivity index (RD), road time connectivity index (RT), accessibility, isolation, settlements, GIS.*

1. INTRODUCTION

Communication and accessibility are very important issues for every settlement. The location of a town or village along the main road may provide an important competitive advantage in comparison to other similar settlements, lying far from the main communication lines. The benefits of such a location may eventually convert the settlement into a “central place” (W, Christaller, 1933). More than that, central places tend to organize their own transport and communication network within their area of influence. Therefore, roads and other transport networks tend to converge towards central places and this is more visible in the case of larger cities. In contrast, villages located at distance from the main roads may undergo severe drawbacks in terms of social and economic development. Isolation may lead to lack of investments, resulting in the absence of facilities, low living standards, lack of labour opportunities, which in their turn determine outmigration, demographic ageing and eventually the negative circle closes when the village has (almost) disappeared.

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However, accessibility is just one aspect to be taken into account. In fact, as stated above, the role of the communication lines is to give access to higher-grade central places, like towns or cities, which provide goods or services that one cannot find at home. Centrality is therefore crucial for the understanding of accessibility (R. Rusu, T. Man, C. Moldovan, 2013). Then, connectivity would not mean just the mere connection to the main transport network, but the degree in which this network would provide the means to get to higher-ranked central places.

The approach would be then to consider the position of specific groups of people in specific locations (either rural or urban communities) and postulate the means by which they might access a set of services or facilities deemed socially necessary. The welfare of the communities depends to a large extent on standards of connectivity and accessibility to such services or facilities. The most valid measure would be the assessment of the space (distance) and time budgets needed for the population of every settlement to reach specific destinations (S.D. Nutley, 1980; R. Rusu, T. Man, C. Moldovan, 2013).

This paper is indeed a sequel of our previous analysis on road connectivity index (R. Rusu, T. Man, C. Moldovan, 2013), based in its turn on former assessments of connectivity and accessibility in Banat (R. Rusu, 2007; R. Rusu, 2008). There are two notable differences between this study and the previous ones. First, the area of analysis has been enlarged, to include the whole West Region of Romania, therefore adding Hunedoara County to the already studied Arad, Timiș and Caraș-Severin counties. Second, and more important, a significant step forward has been made by introducing the road time connectivity index as a new manner of calculating connectivity, starting from the road distance connectivity index, presented in a recent paper (R. Rusu, T. Man, C. Moldovan, 2013).

2. METHODOLOGY

The methodology which fundamented the calculation and assessment of the road distance connectivity index has been drawn up in detail in our most recent work (R. Rusu, T. Man, C. Moldovan, 2013). However, since there is a strong link between the road distance connectivity index and the road time connectivity index, it is necessary to write a summarized version of the methodology for calculating the road distance connectivity index before focusing on the road time connectivity index. More than that, results for both road distance and time connectivity indexes in the West Region of Romania will be presented.

The above-mentioned paper comprised a short description of the recent Romanian contributions on the topics related to connectivity and accessibility (Alina-Gabriela Mureșan, 2008, I. Muntele *et al*, 2010, M.G. Oprea, 2011, Cs. Máthé, 2011) and assessed their strengths and flaws. All these works made reference to more or less recent foreign geographical literature (Haggett and Chorley, 1969; Taaffe and Gauthier, 1973; Chorley and Haggett, 1976; Weibull, 1980; White and Senior, 1983; Spiekermann and Wegener, 1996; Cairncross, 1997; Schürmann, Spiekermann and Wegener, 1997; Miller, 1999; Spiekermann and Neubauer, 2002; Lumsdon and Page, 2004; Duval, 2007; Olsson, 2009; Rodrigue *et al*, 2009, to point out just a few) but made little or no reference to each other or to other relevant Romanian works on the topic of connectivity, accessibility or isolation.

The methodology for calculating the road distance connectivity index was largely based on previous works (Rusu, 2007; Rusu, 2008) on the same subject. Nevertheless, while then a general connectivity index was sought for, this time the focus was on the road connectivity index, using a slightly different approach and GIS techniques. We relied only on the distance to the nearest central places (RD).

Ranking of central places considered for the West Region of Romania

Table 1.

Rank	Short description	Cities, towns and commune centres in the West Region	Settlements outside the West Region
0	National capital city		Bucharest
1	Regional centre	Timișoara	Cluj-Napoca, Craiova
2	Sub-regional centre	Arad	Oradea, Sibiu
3	County seat	Reșița, Deva	Drobeta T. Severin, Târgu Jiu
4	Important middle-sized city	Lugoj, Caransebeș, Hunedoara, Petroșani	
5	Small city or town with large area of influence	Lipova, Ineu, Sebiș, Chișineu Criș, Sânnicolau Mare, Deta, Făget, Oravița, Moldova Nouă, Bocșa, Oțelu Roșu, Brad, Hațeg, Orăștie, Lupeni, Vulcan, Petrila	Salonta, Ștei, Orșova, Câmpeni, Cugir
6	Small town with minor area of influence or urban-like commune centre	Pecica, Nădlac, Sântana, Curtici, Pâncota, Gurahonț, Recaș, Gătaia, Ciacova, Jimbolia, Buziaș, Băile Herculane, Bozovici, Anina, Călan, Simeria, Uricani, Aninoasa, Geoagiu	Vaşcău, Baia de Aramă, Abrud, Zlatna, Bumbești-Jiu
7	High-grade commune centre	Vinga, Vladimirescu, Șiria, Săvârșin, Beliu, Cermei, Ghioroc, Șimand, Vârfurile, Hălmațiu, Biled, Orțișoara, Giroc, Jebel, Cărpiniș, Lovrin, Nădrag, Peciu Nou, Periam, Dudeștii Vechi, Mehadia, Berzasca, Topleț, Carașova, Teregoava, Crișcior, Ilia, Certeju de Sus, Ghelari, Baia de Criș	
8	Commune centre	All the other commune centres	

Therefore, in order to assess the connectivity of settlements, we have first taken into consideration all classified roads within the territory of the analyzed region, and all the settlements. Distances by road were calculated (using GIS) from each settlement to the nearest central place of every rank (except for rank 3, where distance to the county seat was compulsorily considered). For this, a preliminary study was needed to determine the ranks of the settlements within the analyzed territory, and even in the neighboring areas. We relied our assessment on such a hierarchy, based on a previous analysis (Rusu, 2007), which classified the settlements into 12 ranks or levels, starting from the national capital, Bucharest (rank 0) down to the most underdeveloped villages or hamlets, with almost no inhabitants and no elementary services (rank 11). However, for the purpose of this study, we have only taken into account the first nine levels (rank 0 to rank 8, commune centre), considering that smaller villages (ranked 9 to 11)

are irrelevant as central places. Central places belonging to any rank are also included as central places for all the ranks below. For instance, Timișoara, ranked 1, is also considered as ranked 2, 3... down to the lowest rank, as it provides not only high services, specific for regional centres, but also basic goods, available in any low-grade settlement.

The values of distance were then aggregated for every settlement into a connectivity index using the following formula (R. Rusu, 2008; R. Rusu, T. Man, C. Moldovan, 2013):

$$RD = \left(3 - \frac{Dr0}{150}\right) + \left(3 - \frac{Dr1}{75}\right) + \left(3 - \frac{Dr2}{40}\right) + \left(3 - \frac{Dr3}{20}\right) + \left(3 - \frac{Dr4}{12}\right) + \left(3 - \frac{Dr5}{8}\right) + \left(3 - \frac{Dr6}{5}\right) + \left(3 - \frac{Dr7}{3}\right) + \left(3 - \frac{Dr8}{2}\right)$$

where

- RD – road distance-based connectivity index;
- Dr0 – distance from the settlement ranked 0;
- Dr1 – distance from the settlement ranked 1...
- Dr8 – distance from the settlement ranked 8.

The maximal value for each component of the formula is 3, at zero distance, meaning that the settlement belongs to a rank above or equal to the one considered. Therefore, the formula takes into account a highest possible value of 27 in the case of the capital city of Bucharest. All the other settlements nation-wide have smaller values of the connectivity index. Although most settlements have positive scores, values may be negative for each component and overall.

As distances were calculated from every settlement using classified roads, one may face the issue that not all the settlements are actually located on roads, or at least the point representing the settlement is not on any road. Therefore, a range of 4 kilometres to the nearest road has been taken into consideration for the West Region settlements, as for instance 32 villages of Banat are not reached by any public classified road (Rusu, 2007).

To calculate distances a networks dataset was generated using ArcGIS Network Analyst Extension. This dataset included all the roads categorized by types and all the nodes (access points to the network). Based on these the shortest route from each localities to the nearest attraction point was calculated. The final step was to calculate the RD index. The RD value for each settlement was used as input point in interpolation process using ArcGIS Spatial Analyst resulting a raster dataset representing the spatial variability of RD. The overall values for each settlement have been interpolated to produce a map of the road connectivity index in the West Region of Romania (fig. 1).

For the road time connectivity index, we transformed the distances into driving times needed for a motor vehicle to get to certain locations. While distances are important to assess the connectivity of a certain settlement, journey times to central places provide a better and more realistic picture on accessibility and the real connection each settlement has to the nearest central places. For each type of road, we considered a

Distances considered for a score of zero in every component of the formula

Table 2.

Rank	Distance (in km)
0	450
1	225
2	120
3	60
4	36
5	24
6	15
7	9
8	6

certain average speed (table 3). Distances may be perfectly calculated and are always the same (except when new infrastructure is built). Journey times represent however just a mere approximation, because the speed also depends on many factors – the quality of the road, the weather conditions, the density of traffic, the number of settlements and stops on the road. On the same road, the same journey will take longer at peak hours or in heavy weather.

More than that, roads are quite different, even if they belong to the same category. An average speed of 70 km/h is not possible on all national roads. Different road sectors allow for different speeds. Vehicles slow down while passing through towns or villages.

Temporary works on certain roads may also determine a high variability of the average speed. In winter or in heavy conditions, speed must also be adjusted. Differences between roads increase as one refers to lower grade roads. Few county roads are perhaps better than some national roads, while other county roads are unmodernized and even unreliable for driving. The local roads are the most diverse in terms of modernization. While many are still not fit for motor vehicle traffic, important works are in progress in many villages, as a result of the implementation of rural infrastructure rehabilitation programmes.

Accepting the fact that time needed to get to a destination is more relative than the distance to that destination, we transformed all distances into driving times. In few cases, it came out that the shortest route (in terms of distance) is not necessarily the fastest one (in terms of time), as for example between Timișoara and Reșița. Lower classified roads may cut distances, nevertheless they might increase journey times.

Using the same technique as in the case of distance, we assessed the time needed to get from each settlement to nearest central place of every rank (except for rank 3, where the county seat was compulsorily considered). Then we used a similar formula as for the road distance connectivity index, assuming that 1 kilometer = 1 minute, which means that an average speed of 60 km/h is to be considered to achieve a perfect similarity:

$$RT = \left(3 - \frac{Tr0}{150}\right) + \left(3 - \frac{Tr1}{75}\right) + \left(3 - \frac{Tr2}{40}\right) + \left(3 - \frac{Tr3}{20}\right) + \left(3 - \frac{Tr4}{12}\right) + \left(3 - \frac{Tr5}{8}\right) + \left(3 - \frac{Tr6}{5}\right) + \left(3 - \frac{Tr7}{3}\right) + \left(3 - \frac{Tr8}{2}\right)$$

where

- RT – road time-based connectivity index;
- Tr0 – journey time to the settlement ranked 0;
- Tr1 – journey time to the settlement ranked 1...
- Tr8 – journey time to the settlement ranked 8.

Results would be different from those of the distance-based connectivity index. Although the values of the road time connectivity index would in fact depend more on various factors that have an impact on driving speed, it is a more reliable instrument to calculate connectivity. Settlements close to motorway entries/exits or located along or

Average speeds for motor vehicles according to the type of road

Table 3.

Type of road	Average speed
Motorway	110 km/h
National road	70 km/h
County road	50 km/h
Local (commune) road	30 km/h

near national roads will have a better value of the time-based connectivity index than of the distance-based connectivity index. On the contrary, isolated settlements, situated far from the main roads, sometimes at the end of a minor local road, would have worse values of the time-based connectivity index than of the distance-based connectivity index (fig. 2).

3. RESULTS

3.1. The distance-based connectivity index

The results have been already presented for Banat in our previous work (R. Rusu, T. Man, C. Moldovan, 2013). In this paper, Hunedoara County is added to have an overview of the distance-based connectivity index of the whole West Region of Romania (fig. 1).

The overall score of the connectivity index for the 1405 settlements comprised in Arad, Caraş-Severin, Hunedoara and Timiş counties varies between 23.38 (Timișoara, also the largest urban centre) and - 31.91 (Bigăr). More than half of the settlements (804) have positive values of the connectivity index, while the other 601 have negative values and are rather isolated. However, most settlements (1061, or more than 75%) have rather average scores, between 10 and - 10.

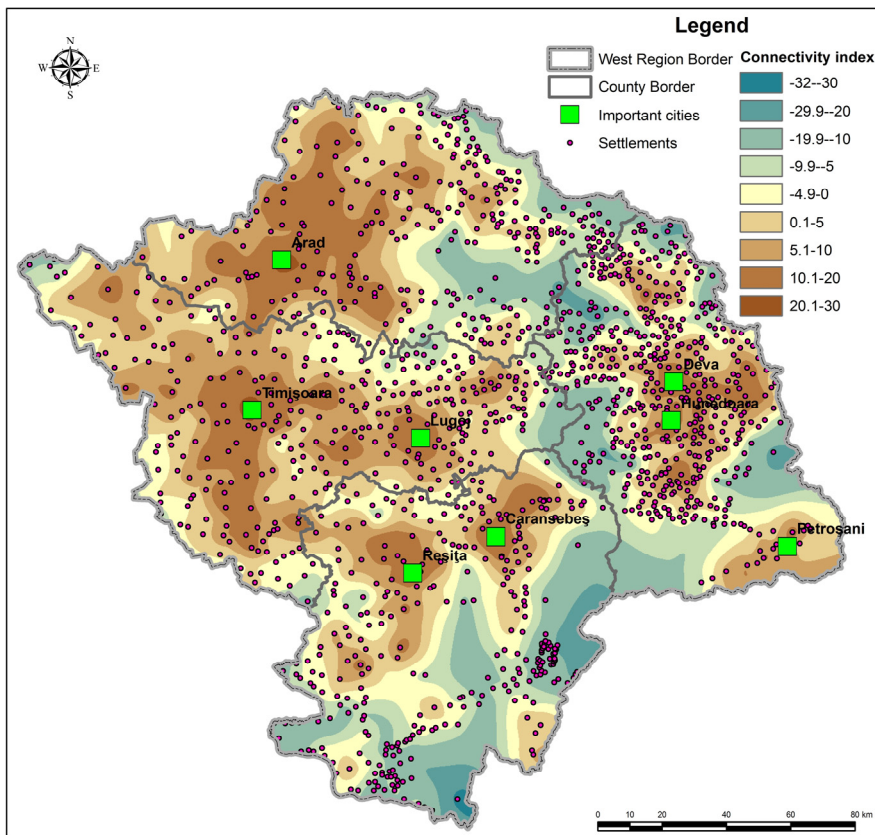


Fig. 1. The distance-based road connectivity index in the West Region of Romania.

Timișoara (23.88), Arad (22.69) and Reșița (20.10) dominate the classification. Large areas with positive values of the connectivity index are surrounding these cities. In Arad County, the area with best connectivity lies between the city of Arad and Chișineu-Criș (to the North), Pecica (to the West), Lipova (to the East). To the South, it is connected to the area centered on Timișoara, which also extends a great deal to the East (to Lugoj and even farther) and to the South (to Deta and Gătaia). In Caraș-Severin County, large areas with high values are situated around Reșița and Caransebeș. In Hunedoara County, although maximal values are a bit lower compared to the other three counties, there is still a compact area with values above 10 along the Mureș (Orăștie) Corridor and to its South, centered on the quadrangle formed by Deva – Hunedoara – Călan – Simeria. High values are also characteristic for the northern part of Hațeg Basin, for Petroșani Basin, for the centre of Brad Basin, and for towns like Sănnicolau Mare, Ineu, Sebiș, Oravița, Anina, Buziaș, Jimbolia, not too far away from the main cities.

The lowest values correspond to the least accessible areas, usually in the mountains, where road connections are weak. Therefore, the lowest score was registered for Bigăr, an isolated village in Almăj Mountains. Similarly low values are recorded for settlements in Metaliferi, Cerna, Țarcu, Șureanu, Găina and Codru Moma Mountains, as well as in Lipova Hills, eastern Zărand Mountains, Almăj Basin.

It is interesting to note that low values also characterize the settlements situated along the borders, like those along the Danube or Nera. Even lowland settlements like Iam, Lățunaș, Grănicerii, Beba Veche (the westernmost village in Romania) and their surroundings, located near the border with Serbia, have low connectivity. This is due to the poor infrastructure close to the borders, on the one hand, and the large distances to the main cities. In these cases, the political factor (the border) acts as a restriction, not the morphology, as in the mountains (R. Rusu, T. Man, C. Moldovan, 2013).

3. 2. The time-based connectivity index

Values of the road time-based connectivity index are significantly different than those of the distance-based connectivity index. While settlements in the upper part of the classification slightly improved their score, due to their good connections to high-grade roads and even motorways, the values decreased a lot for the lower-end settlements, which are not just very far away from central places, but also connected to them by poor infrastructure.

The values of the time-based connectivity index range between 24.08 (Timișoara) and – 64.87 (Meria, in Poiana Ruscă Mountains, Hunedoara County). Less than half of the settlements (666 out of 1405) have positive values of the index; therefore the majority of the settlements have negative values, which points out the low quality infrastructure in many parts of the West Region. About 13% of the settlements have an index above 10, but more than 20% have an index below – 10 and more than 5% register values below – 20.

Once again, the major cities and the county seats are best classified: Timișoara, Arad (23.52), Reșița (20.97), Deva (20.66 – this score does not take into account the recent opening of the motorway sector between Deva and Orăștie). Most of the other cities and towns (Lugoj, Bocșa, Caransebeș, Hunedoara, Simeria, Lipova, Orăștie, Pecica and so on) have scores above 10. Similar high scores characterize the rural areas located in the immediate neighbourhood of cities (Dumbrăvița, Giroc, Săcălaz, Chișoda, near Timișoara; Vladimirescu, Fântânele, Șagu, near Arad, to point out just a few).

The main axes where positive values are registered are generally superimposed on the route of the motorway sectors and the national roads. One large North-South axis crosses the region from Zerind, at the border with Bihor County, to Moravița, in southern Timiș County. Timișoara and Arad lie in its centre. Other areas with positive values are around the large cities, as mentioned before, but they also extend to the West and to the East, along Mureș Corridor (from Arad) or Bega and Timiș valleys (from Timișoara). In Hunedoara County, one should mention the high values of the area between Deva, Hunedoara, Hațeg and Orăștie, as well as most of Petroșani, Hațeg and Brad basins.

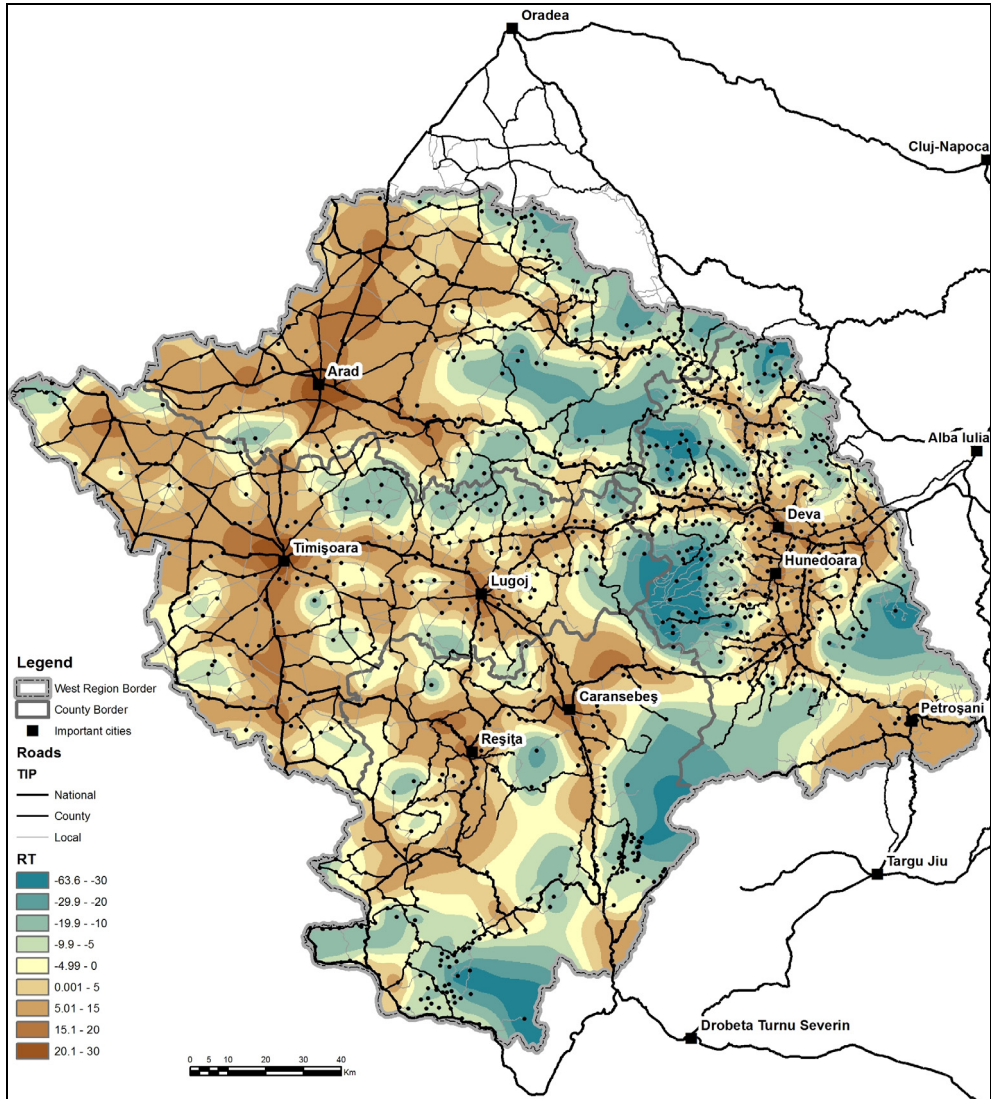


Fig. 2. The time-based road connectivity index in the West Region of Romania.

As in the case of the distance-based connectivity index, the poorest values correspond to isolated settlements, most of them located in the mountains. Meria and Dănulești (in Metaliferi Mountains, - 59.01) register the lowest values. Areas with very low values are Poiana Ruscă, Metaliferi, Găina, Almăj, Șureanu and Cernei Mountains, where certain settlements are grouped either on watersheds (Poiana Ruscă Mountains) or on slopes and dead ends of the valleys.

Low scores are also registered in lower mountains and hilly areas, where topography is not so much to be blamed. Areas in the “shadow” of investments, usually between counties, like Lipova Hills, Buziaș Hills, eastern Zărand Mountains, Codru Moma Mountains and Codru Hills. Also, settlements near the border, but not close to a border crossing point, are in the same situation, as infrastructure is generally poor.

The average value of the road time connectivity index (RT) for the West Region was - 1.87 compared to a positive value of 0.65 of the road distance connectivity index (RD) for the same region. However, while distances are unlikely to change, journey times might improve with the construction of new high speed roads, especially motorways. In the West Region of Romania, works are in progress on the basically West – East A 1 motorway passing near Nădlac, Arad, Timișoara, Lugoj, Făget, Ilia, Deva, Simeria and Orăștie. For the moment, only Arad – Timișoara and Deva – Orăștie sectors are functional, but the whole sector within the West Region and down to Sibiu is supposed to be ready in the near future. The motorway will definitely improve journey times and have a positive impact on RT values for the West Region settlements, especially those located near motorway exits.

4. CONCLUSIONS

This study is based on previous approaches to the subject of connectivity index (R. Rusu, 2007; R. Rusu, 2008) and is organically linked to the work of R. Rusu, T. Man and C. Moldovan (2013) which introduced the road distance connectivity index for the settlements of Banat. While preserving the above-mentioned index and the methodology to calculate it, this study extends the research to the whole West Region of Romania and sets the methodological framework for calculating a road time connectivity index, based on driving times from each settlement to the nearest central places of every rank. Therefore, the main point is that the welfare of the communities depends on the standards of connectivity and accessibility to services and facilities located in central places and that the most valid measure of connectivity would be the assessment of the space (distance) and time budgets needed for the population of every settlement to reach specific destinations (S.D. Nutley, 1980; R. Rusu, T. Man, C. Moldovan, 2013).

The road time connectivity index (RT) is a more reliable instrument to calculate connectivity, even if journey times might vary according to numerous factors that have an impact on driving speed. While distances are unlikely to change, journey times may improve with the construction of the motorways. In the West Region, the execution of the A 1 motorway will definitely have a positive impact on RT values of the settlements.

Both distance-based and time-based road connectivity indexes may represent useful tools in the planning and management of infrastructure projects, in development strategies meant to reduce territorial disparities, as well as in regional and local planning.

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SOCIAL VULNERABILITY IN BUCHAREST: AN EXPLORATORY SPATIAL DATA ANALYSIS APPROACH

AL. GAVRIȘ¹

ABSTRACT. – Social Vulnerability in Bucharest: An Exploratory Spatial Data Analysis Approach. This study examines the social vulnerability of Bucharest through a spatial exploratory analysis. Changes from the past 20 years at urban development in Romania, and particular in Bucharest, are reflected into an increasing social vulnerability. The profile is constructed by numerous social processes to which population has been faced it to. The aging of population, increasing urban density, lower wages, and school graduated, living conditions are just a few of the indicators showing social vulnerability in Bucharest. Data provided by the National Institute of Statistics, CPUMB are used to explore the existence of spatial clusters significant as social vulnerability areas. Methodology framework is constructed on the basis of spatial analysis by analyzing the results of SoV index. The added value to the scientific literature resides in a different approach of calculation – score Hull, instead of the additive model proposed by Cutter *et al.* (2003). The result is a step forward to the mapping of vulnerability in the city of Bucharest, which should provide solutions and possible decisions.

Keywords: *social vulnerability, ESDA methodology, SoV index, Bucharest.*

1. INTRODUCTION

The interest in assessing population vulnerability increased steadily for the past two decades. It was a direct consequence of population expansion in number and its concentration in areas likely to be affected by destructive events where the risk of exposure to hazards is high. The result is that more and more human systems, ranging from states to the local communities, confronted with human and material losses have decided to tackle these issues. The goal is to diminish the losses to a minimum and, to develop programs for helping the local population to cope with possible harsh conditions. To do this the academic research addressed various indices for measuring vulnerability. The different approach and various methodologies were incongruous, without a good correlation between their programs and the scientific results (Fekete, 2009).

Different studies in the field of natural hazards assessment were rapidly developed because of the rising interest of the researchers in answering the new challenge. The differences among these studies are great. The discrepancies in literature starts with the conceptual framework (Cutter *et al.*, 2003), continues with the academic tradition

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and affiliation while trying to balance the target of the studies with the analysis scale, passing through numerous methodological practice, examining differently the factors involved as the data allowed (Dwyer *et al.* 2004; Gall, 2007) and finishes with a large area of results obtained in similar conditions (Boholm, 1998). Moreover, the integration of studies conducted at different scale of analysis is a continuous effort, showing good results in regional approaches (Kumpulainen, 2006) and global analysis (Nakamura *et al.*, 2001). At institutional level, different summits and events for a better management of hazards are also on a positive trend (Rio Conference 1992, IDNDR, 1990-1999, World Conferences on Disaster Reduction in Yokohama 2004, The International Strategy for Disaster Reduction (ISDR) 2001).

Romania is a country with a high seismic activity (550 earthquakes/year as noted by Armaș, 2006), and an increasing number of hydro-graphical hazards even in cities centers with rivers. The national studies focused on hazards are in a direct relation with occurrence of such events and especially with their magnitude. After the 1977 earthquake, the academic activity for seismic activities was greatly supported. This meant good results in the form of mapping the seismic risk at national level for the first time (Bălan *et al.*, 1982). In this period, Bucharest was also in the center of attention (Cornea and Radu, 1979). Studies determined by the next important earthquakes (1986, 1990) were the next to follow with the interest focused on national level (Lungu *et al.*, 1995; Tanislav *et al.*, 2009). But the regional and urban analyses are few and between large intervals of years.

The catastrophes are well represented in Bucharest, a city where the destruction caused by the earthquake in 1977 is often brought to attention by almost every small seismic activity and intense media promotion. The increased attention after such events is nevertheless exaggerated, but their small perception by the people determines the only coherent projects for evaluation the sensitivity of population against events with high natural risk. The most important measure of the authorities was a survey of all the buildings with high earthquake risk in Bucharest which were signaled with a red dot (Lungu *et al.*, 2000). With the exception of this program, the interest in helping the population to cope with various natural risks is reduced. The reasons are many, but the most important one is represented by the difficulty in detecting the areas with problems due to the absence of data or their opacity. Because of this, the data cannot be used frequently for improving urban management and nurture better policies. Moreover, there is a lack of reaction from the authorities and the society as a whole for requesting analysis. In this context, the study of vulnerability and connected topics within Bucharest has manifested itself only in sporadic individual initiatives.

The studies directed on analyzing the social vulnerability of the largest city from Romania – Bucharest – are few and started in the last decade (Mândrescu *et al.*, 2004; Armaș and Neacșu, 2003; Armaș, 2006; S. Rufat, 2009). The most recent initiative with a large goal belongs to I. Armaș which developed the HERA program (2007-2011). This study is concerned with the integrated assessment of city vulnerability in order to inform the population and authorities quickly and well. The success of the program is determined by the continuous monitoring with the help of an IT system for multicriterial and multidimensional evaluation of the state of the urban system in vulnerability and risk studies (hera.ase.ro/obiective).

The study of phenomena and processes at regional or local level has been even more intense, determined by the GIS development and the integration of statistical methods in them (Getis and Ord, 1992; Wise *et al.*, 2001; Anselin *et al.*, 2002 and 2006; Takatsuka and Gahegan, 2002; Rey and Janikas, 2004; Levine, 2006; Rey and Anselin, 2009). Many advantages were created and continue to emerge from this integration. A first advantage is that of a direct observation of the space in which analysis is conducted by its visualization at scale. An emphasis was on the fact that there is a much improved handling in data use and a complex integration for observing different processes and relations (Bailey, 1994). Spatial processes can be easily identified as clustering, or hot spots noticed as useful for understanding the spatial characteristics of functional structure and regional development. Last but not least, this combination allows analysis in various fields that supports the economic decisions (understood as administration, planning and management of elements from territory). Adding to the properties of phenomena reflected by data, though exploratory spatial data analysis – ESDA, it is possible to highlight eventual errors, to state work hypothesis from the spatial point of view of our data. Within this large framework pointed out by hazards impact and spatial analysis, Bucharest is the case study for analyzing the social vulnerability.

The current study on statistical exploration of spatial data connected to the social vulnerability from Bucharest proposes for analysis some methodological refinements where the index developed by Cutter *et al.* over time (1996, 2000, 2003, and 2007) is obtained slightly different: the additive score is replaced by a variant in which a different formula is adopted – the Hull score. The latter has been adopted for a better understanding of the way in which the index maps the reality in Bucharest, but also because of its successful use in the identification of regional disparities as used in Romanian literature (Ianoş, 1997; Sîrodoev, 2008). The comparison of statistical image of SoVI can be further considered as useful in perspective because the results can be reused for more validation with other studies concerning the social vulnerability in Bucharest; this is the case for the study conducted by Armaş (2007-2011) and Rufat (2009). The decision for measuring the vulnerability with the help of SoVI methodology emerges from its application in the EU (Kumpulainen, 2006), from its proposal as solution for regional management in Portugal (de Oliveira Mendes, 2009) and its adoption for mapping of regional vulnerabilities from Norway (Holand *et al.*, 2009). The scale of such analysis is the regional one and while Bucharest is at an inferior level, the study tackles this situation by the importance given to Bucharest through its function as a capital, but also by the high degree of population density in a small area highly affected by hazards.

In this theoretical account the goal of the study is to understand the concentration of population vulnerability and to assess the resulted image. Thus, the emphasis of the study is on spatial depicting of the clusters. For achieving this goal, as well as the other two, the exploratory spatial data analysis (ESDA) is used. The spatial method allows the exploration both statistical as well visual of social vulnerability focused on Romania's Capital. The advantage of the spatial methods application relies on the highlighting of the first law of the geography "Everything is related to everything else, but near things are more related than distant things" (Tobler, 1970, p. 236). In the current case is possible to stress the spatial dependence of the vulnerability areas situated next to each other even if they may be further apart among Bucharest.

The study contains the following structure: the first part aims at indicating the issues which are at the basis of the utilization of social vulnerability concept. The second part has as a goal the presentation of the study area and the data used in the analysis. The methodology is covering the third part, where the techniques used for factors and cluster identification are commented. The last part is reserved to the discussion of the results obtained by the application of the methods.

2. CONCEPTUAL ISSUES IN THE LITERATURE

In the field of vulnerability analysis there are many studies emerged in different contexts. The resulted profile of the vulnerability research shows a heterogeneous image at almost every level (results, methods, approach, theory etc.) (Boholm, 1998; Gall, 2007; Fekete, 2009). Under the stimulus of international organizations, states, changes of paradigm regarding the global evolution and even of the increasing natural hazards, the studies of vulnerability can be structured in three major groups (Rufat 2009):

- the approach centered on financial assessing of foreseeable losses;
- the emphasis of vulnerability factors though algorithmic or matrix methods for developing a representative index;
- the systemic approach, where the highlighting of vulnerability origin and the evaluation of policies involved in risk management are tracked.

These can be included in another 3 direction of analysis:

- the identification of the condition determining the vulnerability of the people or the places importance for it in the case of some extreme natural events occurrence;
- the supposition of vulnerability as social condition in which the society demonstrates resilience against the hazards;
- the integration of the potential exposure focused on microscale or regional level.

In the framework established by these directions, the explanation of social vulnerability remains a difficult topic. The lack of unity especially regarding the concepts used, where definition are overlaying, diverging or imply another linguistic register and then at the level of data available, determines that the main reason of the current studies – mitigation planning – to be still unresolved. Furthermore, the inconvenience of good quantitative representation represents another major issue (Cutter *et al.*, 2003).

In this case, the study presented here follows the geographical framework, where social vulnerability is a dimension of the ‘hazards of place’ model (Cutter, 1996; Cutter *et al.*, 2000; Cutter *et al.*, 2003). The model is successfully applied both in the US and more recently, in Europe. This general understanding addressed in this model is that social vulnerability can be referred as a “measure of both the sensitivity of a population to natural hazards and its ability to respond to and recover from the impacts of hazards” (Cutter and Finch, 2007, p. 1).

3. STUDY AREA AND DATA

Bucharest, the capital of Romania, represents the space for analysis. It has around 1.9 million inhabitants (INS 2002, 2011) or almost 10% of the country population, gathered in a compact territory (228 km²) in which the probability of hazards occurrence is high. Two elements determine here a high risk: the fact that the city is relatively closed

(cca. 150 km) to the Vrancea seismic area and the geological structure of the aluvial plane on which is situated. Studies concerned with seismic risk showed that the constructions are very susceptible to damage (INCERC, Lungu *et al.*, 2000). In addition to that, the urban development of the city emphasized strong inequities, many areas being still undeveloped and with few urban elements of intervention. In these areas, the improvised interventions in the buildings structure and the deficient infrastructure (age, abandonment, selective renewal etc.) enhance negatively the risk. Another issues is that the chaotically development after the 1990 determines the improper circulation in the city when the big rains occur. This situation produces some floods of many aged buildings from different parts of the city. The image of natural hazards from the city of Bucharest is enhanced by the risk of breaking the dam at Morii Lake if some conditions will be met.

The natural hazards aren't the only elements triggering a high risk. In the history of the city it may be found that the fires have played an important role, even if it is at a small scale for the past century. For example in the past 5 years there have been many small fires all over the city, especially in poor areas, but also some important ones in the so called commercial complex of Europe (situated in the eastern part of the city). Moreover, this situation is completed by the economic and social evolution of Romania, in which Bucharest has been its hallmark. The shocks supported by the population in the case of rapid transition to new social, political and economic structures have allowed a great sensitivity of the vulnerability.

The study comprises the residential areas, extracted from the census areas from the year 2002. The solution in the study was to rely on a better scale, but also because the determination of census areas has been an arbitrary one and could produce analysis or representation errors. The statistical social-demographic data have been provided by the National Institute for Statistics (INS), while those concerning the spatial limits of the residential areas come from the Urban and Metropolitan Planning Center of Bucharest (CPUMB). Table 1 shows the statistical dimension of the population living in 154 statistical units, distributed among the 6 administrative sectors of Bucharest.

Statistical Descriptives of Population in Bucharest

Table 1

Mean	Median	Standard Deviation	Minimum	Maximum	Sum	Count
12508.7	12373	3758.84	5550	24451	1926334	154

4. METHODOLOGY

Many and important statistical application on spatial level marked the past 20 years (Fisher and Getis, 2010). The spatial statistic analysis started with the development of EDA (Tukey, 1977), which evolved into exploratory spatial data analysis (ESDA) once the computing power and technology allowed that, at the beginning of the '90s. The method comprises of set of techniques which allow the easy depiction of statistical data by their visual representation, in order to facilitate the estimation and testing of the models. Complex phenomena as that of social vulnerability can be represented

with the help of ESDA for highlighting patterns and different characteristics of spatial structure. Moreover, it is possible to propose the hypothesis and models which will be tested in another set of techniques known as confirmatory spatial data analysis, but which isn't the goal of the study.

The analysis focused on studying the spatial differences of social vulnerability in Bucharest uses the SoV index (Cutter *et al.*, 2003). What differs from the initial algorithm is the use of different way of calculation of the index in the last step. It was preferred the testing of the Hull score in this case, relying on studies conducted in Romania with its help and which allowed some good identification of spatial inequities at regional level. Another argument is that SoVI can be verified for the current space, if data is available. The stages of the study are defined by following: factor identification, SoVI calculation, analysis of the results from ESDA.

1. The following steps determined the factor identification:

– as social vulnerability is strongly influenced by a high number of characteristics (Cutter *et al.*, 2003 tab. 1, p. 246), and in the case of census data in Bucharest, aren't essential variables available, we are aware that the results may suffer. Following the methodology described by Cutter *et al.* (2003), the study verified the variables for not overlaying, and then they were standardized.

– utilization of principal component analysis (PCA) for selecting the variables which explain the most the social vulnerability. The results show that the three selected factors explain 78.698% of the variance (tab. 2).

Factors of social vulnerability in Bucharest

Table 2

Factor	Name	Explaining %	Dominant variable	Influence
1	Social-economic structure	33.730	Persons in need of assistance	+
2	Social structure	28.440	Widows	+
3	Housing	16.529	Private property	+

The first factor involving social vulnerability has 8 components (tab. 3). They are the population under 5 years, dependent persons, mean number of population from a household and people involved in tertiary activities, all with positive loading. The remaining ones comprise the negative loading and they are determined by the active women and people with faculty degree. These variables are explained by the fact the people with a good intellectual background may react better and the women that were promoted by the communist regime (as being equals with men) have found good opportunities for business. The surprising part is that people involved in services record positive loading. The economic conditions from the beginning of the 21st century in Bucharest may be a proof; many people trying to open small business, but mostly for survival at those times (so called boutiques – buticuri).

Rotated component matrix of social indicators in Bucharest**Table 3**

Persons in need of assistance	0.897		
Children under 5y	0.839		
Unemployment	0.816		
Population with tertiary activities	0.798		
Women in total active population	-0.71	0.374	0.417
No. of people/house	0.699	-0.539	
People which graduated a faculty	-0.698	0.602	
Health conditions	-0.575		-0.513
Widows		0.943	
Population above 65y		0.917	
Women in total population	-0.329	0.818	
Housing area	-0.45	0.694	
Private property			0.844
Active population from the total			0.805
Personal heating conditions		0.556	-0.656

The general opinion on the most affected people by risky situation is that women and elderly people are first, though this may vary, especially in the Nordic countries (Holand *et al.*, 2009). In the city of Bucharest the general approach applies, just that they are overlapped by even a strong influence of widow people. This new variable is the result of the Romanian society where the family values from the past maintained. Thus people in communism would receive an apartment if they had a family and the large families were better supported by the regime. After the '90 the social dissolution may allowed other explanation, not clear at this moment though.

Housing conditions are determined by the, the living area per person, own heating (stoves) and air conditioning presence. As the apartments are in general small and the improvised infrastructure (air conditioning and heating) were many, the explanation is logical. The difference is that it may look awkward when one looks on them in the literature. Numerous fires though, have started as a consequence of such self made equipment or interventions in the house structure with no legal permits (wall demolishing, balcony building with no authorization).

The third factor shows that overall active population used to work mainly in industry has a large influence on social vulnerability. People still involved in industry in 2002 where the ones who couldn't adapt to the new economic conditions. Moreover the wages were diminishing fast so their chances to recover are directly proportional. This factor is alongside private property and private heating conditions, forming a mix which was labeled as housing due to ratio of elements involved.

2. SoVI calculation in which Hull score is used. Regarding the Hull score this is determined as it follows:

$$SoVI_{Hull} = 50 + 14 \frac{\sum x - \sum y}{n}$$

(after Ianoş, 1997, p. 107)

x - positive variables
 y - negative variables
 n - total number of variables

3. The results analysis by using ESDA with the help of Geoda software (Anselin and Syabri, 2002).

The next step is the building of cartographic representation for analyzing the spatial distribution of data and for identification of outliers (extreme values) or atypical locations. This was done by the help of choroplethic map in the first case (Fig. 1), while on the latter the box-map underpinned the others.

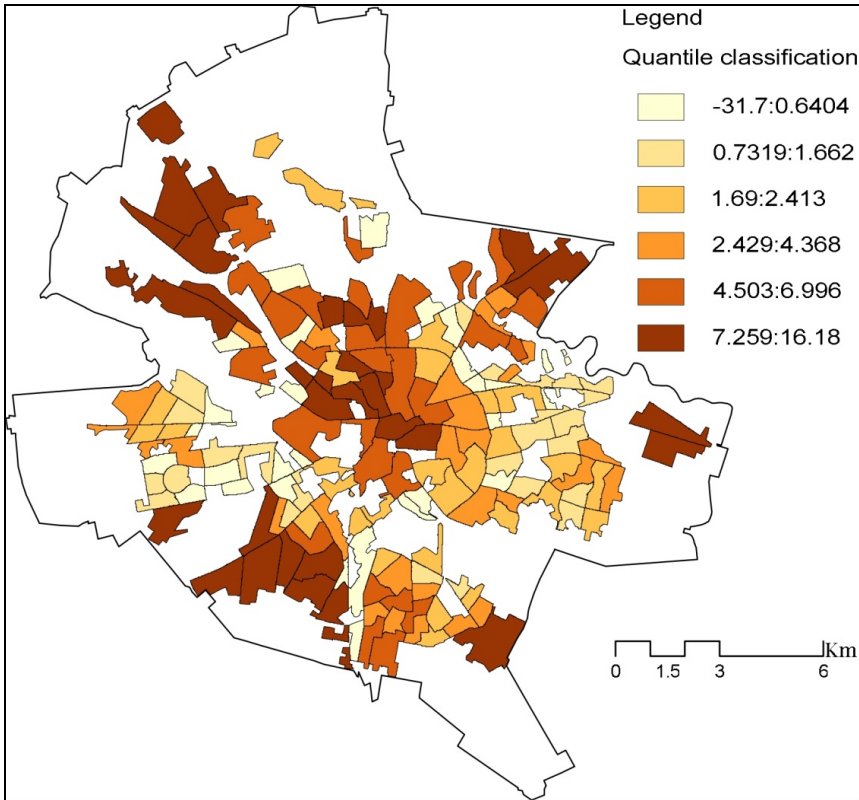


Fig. 1. Exploratory mapping of social vulnerability in Bucharest.

Applying Moran's I at global level for highlighting the existence of clustering in the case of areas with social vulnerability – clustering test (Anselin *et al.* 2006) and by this of identifying the spatial auto-correlation for the residential units in Bucharest. The representation given by Moran scatterplot (Fig. 2) doesn't take into account the location from the map. It allows the view of the statistical testing result of the significance for social vulnerability clusters against the possibility of existence of null hypothesis.

The conditions in which the null hypothesis is reject, allows proving that vulnerability clusters aren't the result of chance, but they are a consequence of some spatial process (Dogaru and Mocanu 2010). It can be noticed that the Moran's I showed a significant spatial correlation of data (ranging from 0.01 to 0.001) (Fig. 3). Moran's I scatterplot displays the linear association of the distribution of the SoVI standard deviation with the spatially weighted average (lag_i) of the data index corresponding to the neighboring values of the Bucharest units. The spatial lag was calculated as it follows:

$$lag_i = \frac{\sum_{j=1}^n W_{ij} x_j}{\sum_{j=1}^n W_{ij}}$$

(Fisher and Getis 2010, p. 290)

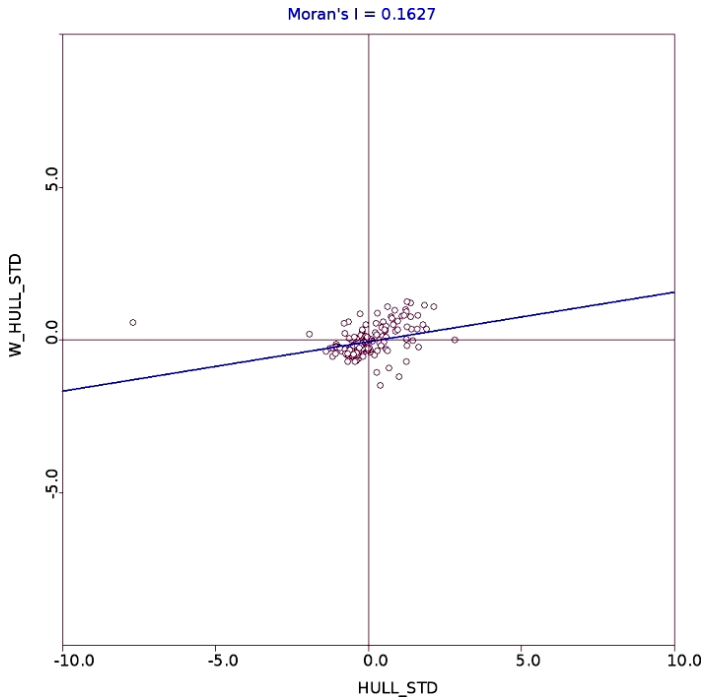
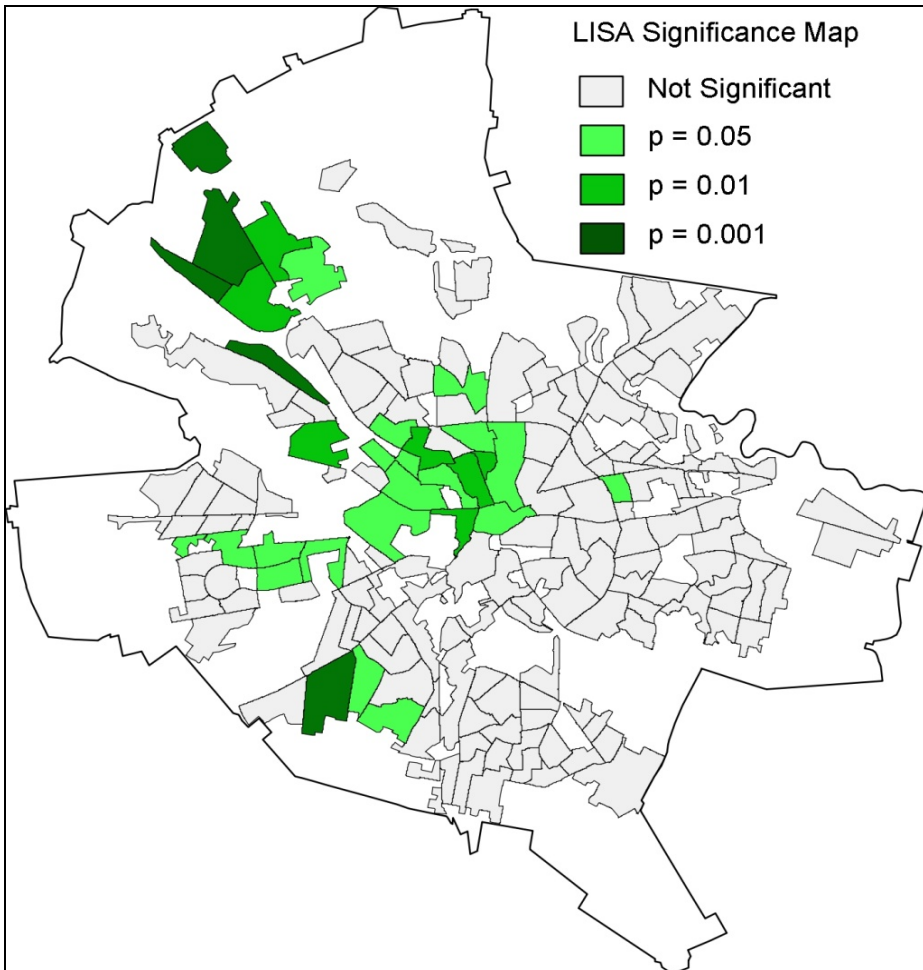


Fig. 2. Moran's I scatterplot.

The observation on Moran's I (equation 2) scatterplot shows also, that points with high values over the mean and which belong to the index, are surrounded by values which surpass the mean. This situation is encountered in the upper right section from the display. Similar is the case for the inferior left part (low-low), where the residential units have low values under the mean of vulnerability index, but closer to each other. In the current stage of analysis the other two sections of the scatterplot tell about the values found on sides against the mean value of vulnerability.

$$I = \left(\frac{n}{S_0} \right) \frac{\sum_i \sum_j w_{ij} z_{ij}}{\sum_i z_i^2}$$

(Anselin, 1995, pg. 99)

I – Moran's I*n* – number of observations*S*₀ – sum of all spatial weights inside the matrix ($S_0 = \sum_i \sum_j w_{ij}$)*w*_{*ij*} – spatial weighted average matrix (connectivity) among the neighboring units*z*_{*ij*} – standardized scores of attribute values for unit *i* and *j***Fig. 3.** LISA significance map of social vulnerability.

Though many techniques are components of ESDA (Sang-Il L., 2005, p. 276), the preference is towards the local indicators of spatial autocorrelation. The study uses LISA for identification the clusters distribution and the possibility of examining maybe patterns where areas with similar values of social vulnerability are nearby to each other. This is done by the visual information determined by maps where it can be seen those grouping areal as hot spots or cold spots (Fig. 4). In fact they are the residential units in which the social vulnerability is similar (positive or negative against the mean), being surrounded by other units with the same characteristic of data. This means the localization of those areas according high clustering of some process can be identified, despite of its position against the mean value. The subjective description perceived before the study is mostly proved: the central part of the Bucharest contains the most areas with high social vulnerability. Regarding the explanation of the Moran's I scatterplot applied on local level, the case differs no more from the presentation made above for global level.

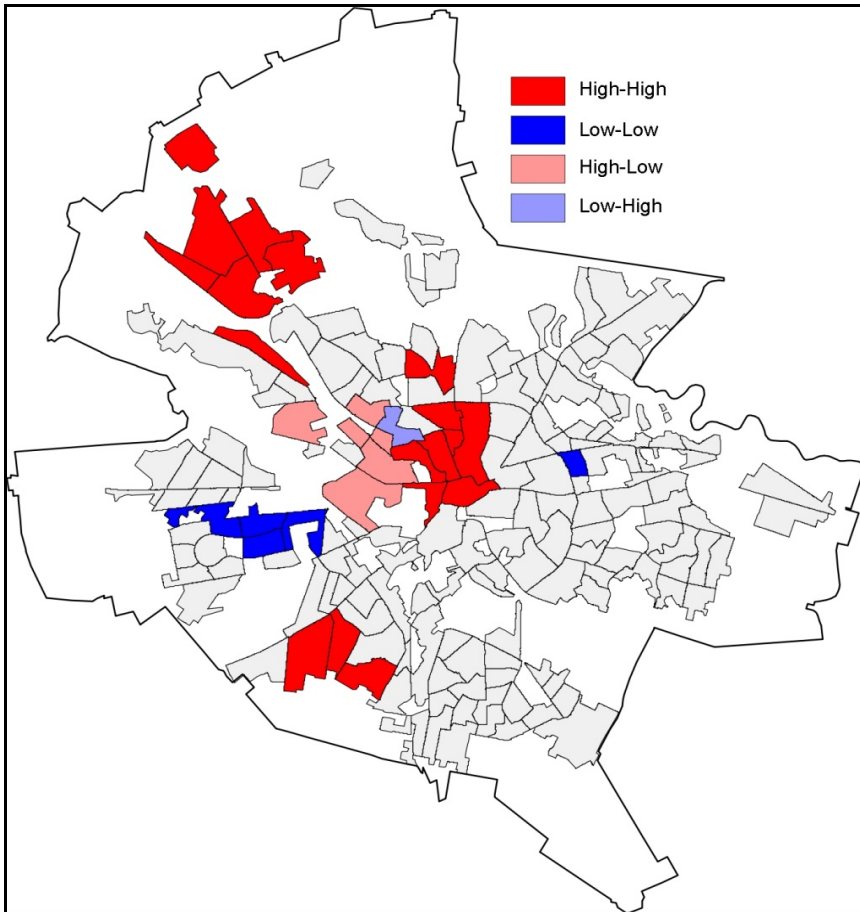


Fig. 4. Clusters of social vulnerability in Bucharest.

The permutation (999) of the results of Moran's I (equation 3) emphasizes of the degree of significance of spatial auto-correlation with the help of the corresponding map. The graphical results display a strong spatial association in the central part of the map of the values over the mean, while there are some smaller clusters where the vulnerability records a good image (cold spots). The acceptance of the alternative hypothesis which states that in Bucharest the association isn't the result of chance shows, by the obtained results, that it can be the consequence of the complex interaction of factors analyzed, but which can be further completed by a more data as they will be available.

$$I = \frac{z_i}{\sum_i z_i^2} \sum_j w_{ij} z_j$$

5. DISCUSSIONS

The main goal of the study was to emphasis the space in which population may be greatly affected in the case of some extreme events and to verify the spatial image resulted from applying the algorithm used by proposing an alternative in the last step. Thus, the study on social vulnerability in Bucharest city detected some noteworthy elements. The calculation of SoVI shows the high risk covering the central area of the city. By using the Hull score it is highlighted the fact that population from the south-western part, overlaying on areas with strong accents of segregation, may suffer highly in the case of natural or anthropic negative incidents. From the normative point of view it is important to say that the study presents a useful image, though the above clusters formations, for all the stakeholder involved in the city (with the mention that it has to be updated with newer data and filled with more variables, if available).

Amid the rapid change of the society it is noticed the major importance of the social factors. They play one of the most important roles in Bucharest. Here, they explain the most part of the social vulnerability (this may be too strong because of the unavailable economic factors). The relation among these factors shows strong tendencies of increasing the gap for the social vulnerability in Bucharest.

Another factor to be considered in the study is the building age. Though it is another dimension of vulnerability, buildings related elements can increase the vulnerability of the society as the time goes by. Many buildings are over the limits of construction in the central part, and those erected in the communist period are reaching fast also. The quality of materials and techniques used for the buildings may display more, but at the moment there hasn't been an update study for the last decade.

Presented in the collective perception as the sum of superlatives from the country (Nica and Gavriş, 2009), the city is the realm of manifestation of a stronger process of advanced dissolution on many levels (economics, social, politics etc.). Being at the top of territorial planning system, but with acute problems of management, forms continued from the over-centralization communist period, the city looks like being less flexible in adaption to the new changes. The lack of intervention and coordination, together with the habit of the people for waiting a signal from authorities first, determines the weakness of population resilience. This fact is best proved by the presence of vulnerability clusters in the central part of the city with extension on the northern part of the sector 1, where the elite population has maintained over time. So even if an

area is comprised of important population (economics, politics) it is in the same situation as the poorer areas from the sector 5 and 6. One can say that people from the high-class areas may lose all, while the others have nothing to lose. Irrespective of the social characteristics or the economic level of the population and the interest for development, the city remains under the high incidence of risks, population and authorities having no real answer to the catastrophic events.

The reference over the situation presented above is determined as it is a key point in framing the image used for understanding the distribution of social vulnerability. As in the communist period, the elites were living especially in the central part and the old constructions remained difficult to renew or demolished, even after the 1977 earthquake, the central part of the city encountered few interventions. Moreover, the law which allowed people to buy their living apartment (only 5-10 the wage from the beginning of the '90), has allowed that most of the investments to be at personal level and not in the urban space as a whole. On the other hand, the boom of the real estate price from the 2000s created some specific situation. People owning a dwelling (apartment or house) from the central part of the city were mostly aged people with little interest in selling them. The image is completed by the legal incidents over buildings which remained in no man lands for some years, entering into a decaying process. Thus this area is characterized by some particularities as the style of the aged population and the high proportion of private ownership constrained greatly the protection intervention and urban renewal plans for buildings, identified as being in the first class of seismic risk.

Regarding the social vulnerability clusters situated in the South-West and North-West, they are the results of industrial policies. The housing estates built rapidly in the '50s (Ferentari – SW) or those in which the risk of earthquake effects has been neglected at the end of '80s (poor materials in the Griviței, Bucureștii Noi or Dămăroaia neighborhoods – NW) have been some of the places in which rural population was attracted by the communist regime of that time to live and work in nearby industrial platforms. These people maintained mostly the way of life of their origins, this being a great issue nowadays. The massive restructuring of the industry started in the '90s led to more difficulties for population adaptation and thus, some clusters of high social vulnerability have been formed. Because of this, it can be considered, unlike other studies where the active population determines negative influence of social vulnerability, that in Bucharest it allowed an opposite influence, yielding population sensitivity.

Another area of clusters in Bucharest is the one located in the western and eastern parts of the city. It is a cluster where the values are highly similar and under the mean (cold spots). The explanation forms around the communist strategy of bringing here many high skilled people – Drumul Taberei was known as an intellectual neighborhood. Moreover, the commercial boom at micro-territorial level in this area shows a fast adaptation of the population previously employed mostly in industrial activities. The field study recorded signals of social vulnerability in these areas, which shouldn't miss nor being ignored. It is considered that data missing determined such situation.

These anomalies against the perception on Bucharest need further testing and the integration of more variants for calculation or data which should allow the calibration of future results. The monitoring of these areas is necessary for understanding those possible advantages which created a clustering of population able to become resilient to risks and thus, they may be copied and updated through improved policies in areas sensitive to hazards.

6. CONCLUSIONS

The study on social vulnerability in the city of Bucharest showed some interesting elements in terms of scientific novelty. At this stage of analysis, the research offered the chance of identifying some spatial patterns of social vulnerability. The spatial patterns were represented by the maps of clusters and they have been found as being statistical valid at different levels. The calculation of SoVI created a broad image of the vulnerability across Bucharest, little known from this point of view.

Though the study examines a much discussed and highly important phenomena, it is limited by some elements. At first, it can be easily noticed that obtaining data represents the highest barrier in processing a useful analysis for future actions. From these results emerges the low possibility for development of new strategies or improving the existing ones in order to allow the population to overcome the risks and to adapt to new situation of possible hazards occurrence as a prevention measure. Another issue is the opacity and the possible absence of reliable economic data, which in every study are presented for assessing the cost or the losses and policies interventions. Likewise, the study is only a snapshot, a moment in time for the year 2002, without being able to make a comparison with that of the 1992 regarding social vulnerability.

Although, many drawbacks exist, the study is a starting point that can be developed with the introducing of additional techniques and more testing instruments. Future plans rely in applying CSDA for testing the spatial regression and possible modeling. In this case it can be considered the framing of the models, the estimation and its diagnosis at statistical level for those predictions which may complete the social vulnerability in Bucharest. Some directions will be targeted toward the new census from 2011 and the possible inclusion of different methodology for comparison of the results and the updated social vulnerability image.

In this phase, the results are a good scientific asset and an opportunity for authorities to reconsider the impact of natural hazards and especially to develop and strengthen the measures for improving the population resilience.

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GENESIS AND EVOLUTION OF THE CULTURAL LANDSCAPE IN METALIFERI MOUNTAINS

CAMELIA-INA GAVRA¹, RADA VARGA²

ABSTRACT. – **Genesis and Evolution of the Cultural Landscape in Metaliferi Mountains.** Analyzing the historical development of the Metaliferi Mountains area (situated in southern Apuseni Mountains, between the limits marked by Crişul Alb, Abrud, Arieş and Mureş valleys), there is a clear continuity of habitation from prehistory to the present. Archaeological artifacts and written documents prove this fact. Its impact on the landscape and culture cannot be overlooked: in a discontinuous populated area, nature has time to return to its previous forms (before human habitation), while a permanent inhabited area is constantly changing, both through human intervention and by adapting to this intervention. Behind this continuous habitation are the rich soil and subsoil resources, which have historically attracted entire communities and generated complex demographic processes. The wealth of minerals, along with the climate, conditioned the industrial profile, focusing it on extractive industry (forms adapted to different historical moments), on wood exploitation and finally on agriculture. The environment reorganization, natural forces (water) usage, the communication development (roads) are the results of the process through which man has capitalized nature. If by mid-twentieth-century the cultural landscape of the Metaliferi Mountains experienced a gradual anthropogenic modeling closely related to the advance of mining techniques, since 1948, an ideological component was added to technological modernization, which forced the industrial development of an area which would have needed economic balance and social well-defined policies. Because of this, imbalance and abuse occurred, which, without the intervention of regulating factors, threaten to lead to the irreversible destruction of the local cultural heritage.

Keywords: *Metaliferi Mountains, cultural landscape, mining industry, agriculture, tourism.*

1. INTRODUCTION

The cultural landscape of the Metaliferi Mountains has emerged through the material manifestation of human intervention. The transformation of the natural landscape took place gradually, as a result of: human actions taken to meet basic needs, population growth, technological and scientific progress, and lately, new needs, trends (adopted by the natives from other people), fashion etc. Landscape transformation involved structural transformation (thereof, through the removal of natural elements and/or the

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introduction of cultural elements), as well as functional transformation (transformed landscape getting new and different functions). Thus, due to rich and varied deposits (gold and silver, minerals and a number of other metallic and nonmetallic resources), Metaliferi Mountains area (fig. 1) has been inhabited since prehistoric times, as archaeological discoveries stress upon.

The development of human settlements in the region was marked by the first attempts of adapting to environment, achieved through folding the activities according to it, but also through the relief transformation and its final adjustment to human needs. It remains remarkable that, although the area is not very populated today, as only about 1.7% of the Romanian population lives here (Plăiaș I. 1994), habitation was consistent and unequivocal during all historical periods. This, undoubtedly, is due to the rich natural resources, especially gold and silver deposits.



Fig. 1. Location of Metaliferi Mountains.

2. ANCIENT PERIOD

The whole history of human habitation in these mountains is linked to the need of adaptation to the morphological and climatic conditions and to the desire to exploit resources and to change the face of the region. Chronologically, the first traces of human habitation date from the Paleolithic and are related to specific landforms.

Traces of Paleolithic habitation have been found in caves – Șura de Jos and Gura Lupului – the latter sheltering some processed manually bones of *Ursus spelaeus* and some quartzite chips (Andrițoiu I., 1978). On Cremenos Hill near Basarabasa village (Vața de Jos commune) anthropomorphic traces dating from the Middle and Upper Paleolithic were also identified, but this time we are not dealing with cave habitation, but with the exploitation of the main natural resources, namely the opal. Another very early opal exploitation (but this time associated with the obsidian) is attested in the village of Valea Brad (Rișcuță C., 1995-1996).

For the next prehistoric periods, fortuitous discoveries are much more numerous, consisting from a wide range of disparate artifacts. However, traces of occupation are more difficult to identify, as actual excavations took place only in few prehistoric sites. Without doubt, we can imagine that human settlements were much more widespread than the few we have clearly documented. These periods, before man entered history (in the periods when he became producer of written sources) are characterized by a massive numerical growth of human population and socio-economic development of all aspects that led ultimately to the ancient societies substantiation.

With this demographic growth, during the Neolithic and Bronze Age, habitation on Metaliferi Mountains continued uninterruptedly. This fact is identifiable through the artifacts and by residential areas, such as Almaș-Săliște, located in section "În Săcări" on a steep hill that rises about 60 m above the altitude of the present village (Popa C. I., 2004).

For the Dacian period, archaeological traces of alluvial gold exploitations were scarcely found and those that have been preserved, such as some alluvial sand mounds on river floodplains (arisen from these techniques to obtain gold), cannot be dated.

The existence of galleries for ore exploitation, especially gold, was assumed for the Dacian Era; by assimilating them into the more sustainable and more developed galleries of the Roman period, they become invisible (according to *2000 trepte...*, 1979). We can say that most of the Roman mines were built on existing shafts. The material evidence of the Dacian presence is not rich, its overall image being formed from several disparate findings, such as: the coin found in Poiana village – Balșa commune, the furrower from Crăciunești village - Băița commune (Glodariu I., Iaroslavschi E., 1979). Many indirect evidences (spread over these mountains) show Dacian gold and silver exploitation, including the huge amount of precious metals captured by the Romans after the conquest.

After Dacia was transformed into a province by the Romans, they brought unprecedented urbanization and habitation of the area and intense systematic exploitation of its natural resources. Of course, the most spectacular are those of the gold mines, but they were not the only ones. The mining area's defense (integrated into Dacia Superior) was one of the Roman's army strategic priorities in Dacia, which influenced the location of the troops and thus the cultural landscape of the whole province. On the other hand, the region itself will be affected by massive colonization of the Illyrian miners groups (Bărbulescu M. *et al.*, 1998). The headquarters of the *procurator aurarium*, an official appointed by the emperor and in charge with overseeing the mines (especially gold mines, as its name says), was at Zlatna (Ampelum), the administrative center of the Apuseni Mountains. If the Ampelum area was the Roman center of the gold area, Alburnus Maior (Roșia Montană) is certainly the best known settlement in Metaliferi Mountains. Roșia Montană became famous because of its tens of kilometers of Roman gallery available today and because of the waxed tablets progressively brought out to the light (*tabulae*

ceratae). Through the waxed tablets, intimate details of life in the Alburnus mining community are known, such as: the initial organization and difficulties of the *collegia* (professional and religious associations), slaves and real estate prices, how work was "rented", usurious loans mechanisms (the purchase of technical equipment, necessary for mining exploitation) etc. (*Inscriptiile Daciei romane*, I., 1975).

Gold veins were exploited (trapped in very hard volcanic rock) at Roșia Montană. Their removal was made by galleries (*cuniculi*) and pits (*cutei*). In structure and strength, they are no less than the modern ones. The extraction galleries were often branched or arranged in tiers, being carved with the chisel and pickaxe. Ore exploitation was done "by fire (fire + water = sudden cooling and crushing), by chisel, by holes filled with water and plugged with wood stoppers, which, by striking, developed pressure and causing rock cracking" (Duma S., 1998, p. 33).

As Plinius explains in *Naturalis Historia*, the Romans also knew the amalgamation process: the gold was mixed with mercury and then the mixture was shaken and poured over a leather thus, through the pores that mercury was leaking, but not the gold. Also, gold could be, according to the same source, fried together with lead. Native gold, unpurified, was mixed with large amounts of silver. It was pale and it was called *electron*.

With the Roman conquest of Dacia and the setting up of Dacia province, superior systematization and a perfect adaptation of human settlements to the geographic requirements was evident. Except for the surface mines and tens of kilometers of underground galleries, the Romans changed demographically the region, by colonizing a large number of Dalmatian Illyrians (traditionally specialized miners). The Roman era brought the beginnings of the area's urbanization and its consistent demographic growth. It foreshadowed the major mining which will find its equivalent only during modern times. It is a shame that the road network was only partially preserved, but from the historical continuity principle, applicable to this mountain area, we can assume that it was largely superimposed by the medieval roads and further by the modern and contemporary roads.

3. FROM MIDDLE AGE TO CONTEMPORANEITY

The ethnogenesis process, which took place between the 4th and 9th centuries AD, gave birth to the Romanian people and Romanian language, as a result of the migrations' addition (especially Slavic) to the Dacian-Roman population and to the provincial language (Bărbulescu M. *et al.*, 1998). The mining evolution in this period is unknown, but the continuity of production by means and techniques of the Roman period can be assumed. In terms of gold mining, it experiences a decrease of gold exploitation in mining galleries and an increase of gold exploitation from alluvial sand. "In the settlements, archaeological excavations in Metaliferi Mountains have not revealed traces for the VI-XI centuries, but it is impossible to imagine that the mining area was abandoned" (Neag R., 2004, p. 47).

In the 11th century, when the Hungarian kings seized all of Transylvania, Metaliferi Mountains resources were a major attraction, both for gold and iron reserves. Initially, in 1035, King Stephen of Hungary established by a diploma that the entire region (where gold was exploited) was to become royal property and its inhabitants became serfs of the crown. To increase the exploitation he turned to German, Slovaks and Hungarians miners and colonized them in compact groups in this region (Sîntimbrean A., Bedeleian H., 170

2004). In this world of the early Middle Age, the transport routes were mostly the poorly restored Roman roads and the central power could not always locally impose itself. These facts specifically affected the Metaliferi Mountains area. The state was not able to invest in the mining infrastructure, so mining continued to decline in favor of gold exploitation from alluvial sand, as evidenced by documents that have been preserved. Anthropogenic traces of this activity are sinkholes of sand, sifted in search of gold dust (Morariu T., Onișor T., 1971). The church is an important element which first appeared in the cultural landscape of the Middle Ages. Initially, churches must have been made almost exclusively of wood both for practical (the most available material) and spiritual reasons (Jesus was a carpenter). Religious buildings of stone, especially cathedrals, were specific to cities alone. The oldest preserved wooden churches are dated during the 14th century, but certainly their origins are much earlier. The wooden church from Lupșa Monastery (1429 AD), situated at the Metaliferi Mountains border (Lupșa commune), is a good example. It is also an evidence for the permanence of wooden architecture here. Other similar buildings with special architectural value are situated in Ponorel, Gârda de Sus and Vidra villages. The small size of the churches is an important demographic indicator to determine the human potential that is served. It should also be noted that it is possible that wooden churches changed their place over time, moving as villages grew, or even sold to get the money for raising a new and larger church – proof of the community expansion (Ciangă N., 2007).

“Most people in this area were Romanians. In the 18th century, local gypsy goldsmiths received special privileges...” (Morariu T., Onișor T., 1971, p. 21), along with German, Slovaks, Czechs and Hungarians colonists. The importance and size of their communities increased after the 16th-17th centuries, when local gold resources have entered into the European economic circulation. *“An important role in this respect had the start of mercury exploitation from Zlatna and Abrud”* (Matley I.M., 1971, p. 119). But in terms of historical geography, between the early Middle Age and the beginning of the Modern Age, the regional cultural landscape suffered minor changes. However, cultural landscape was continuously modeled by anthropogenic factors. Major anthropogenic structures did not exist between the 11th and the 17th centuries.

The main cultural elements which people produced over the medieval period are largely identical to those of the ancient times: human settlements, inns, roads, mills, mines, sheepfolds, deposits of mining tailings and alluvial sand deposits, all these marking the types of activities undertook to meet people’s needs. As an exotic cultural element, the hangings can be mentioned. They were placed on highest surfaces, close to road junctions, evidently for warning potential criminals (*Az első katonai felmérés...*, 2004). Churches also have replaced the ancient temples.

In our days, the typical rural settlements for Metaliferi Mountains area are the scattered ones, the dispersion model being used since the pre-modern era. Instead, *„rural settlements density places this area on top in Romania (29 villages/km²), because the number of households that are included in a village is very low –can reach about 6 households-”* (Boțan C. N., 2008, p. 54-55). In their case, it is not just about modeling the landscape, but also the reverse process: an adaptation to natural conditions, because high relief makes the existence of extended and compact forms of habitat impossible. As a consequence, these settlements extend on tens of square kilometers.

The lack of homogeneity, a specific mark of rural settlements, is presented in our area of interest in its most radical form and of course, following the argumentative logic of the sociologist George M. Marica, it is assumed that its psychosocial influences on Metaliferi Mountain population are intense (Marica, M. G., 2004). No wonder "moșii" were always considered special people and were invested with some qualities and faults, hyperbolic in comparison with those of most Romanians in Transylvania (most honest and hardworking, but fierce and easily irritable).

Capital accumulation and the need to increase safety led to the development of stone and brick buildings, of multiple level homes and of churches from the same materials as other contemporary buildings. But even these cities - boroughs in fact - ("*opiduri*") brought little changes in the regional cultural landscape, compared with those brought by the modern epoch, because people, at that time, did not benefit from drinking water adduction systems, manure and waste disposal systems, public sanitation systems etc. (Neag R., 2004, p. 83-85). During the 18th century, the first regulations concerning deforestations, imposed by the Austrians, began to appear, out of economic reasons: population growth and unregulated usage of resources determined the decrease of the forest area at the expense of the state (Matley I. M., 1971).

In the pre-modern era (17-18th centuries), mines have escalated due to an invention which entered into the miners' arsenal: gunpowder to easier pierce the hard rock of the Metaliferi Mountains, with explosives based on this product. For the cultural landscape, the introduction of gunpowder meant the beginning of an era that has continued until today, characterized by anthropogenic changes made with industrial elements (chemical, mechanical), unlike the manual ones employed before (Sîntimbrean A., Bedeleian H., 2004).

Around mines or administrative offices, urban centers emerged. Basically, cities imposed themselves in the cultural landscape of the studied area by a compact aspect and by some related industrial facilities: ore washing troughs, mines, mills etc. Thus, the higher the industrialization level was, more changes the town produced, such as: the deforestation, the appearance of ponds etc.

Although, thanks to innovations in mining of craftsmen - new models of sluice boxes (Duma S., 1998), new techniques have emerged, that facilitated the effort to extract ore. Gold extraction from alluvial sands continued until the interwar period, but at an increasingly lower pace, because the quantities extracted by a man (on average 1 to 1.5 gr./day) did not cover the necessities of life (Morariu T., Onișor T., 1971). By default, the specific of the area generated the development of building materials industry, either stone clay or wood. In present days, we can talk about the building materials industry in the Metaliferi Mountains for limestone quarries (Cocean P., Filip S., 2008), although, in the past, wood represented a resource at least as important.

In the course of time, wood abundance and the constancy of its usage have made work in the industry to become a true art, documented by numerous examples, from architectural achievements to common household objects, transformed into artworks (Petrescu P., Stoica, G, 1981).

Insignificant changes were observed in agriculture. The specificity of mountain agriculture, based on livestock and the growing of a few plants adapted to the microclimate, has not changed until after 1948, with the first attempts to collectivization.

The agriculture practiced in Metaliferi Mountains did not lead to major changes in the cultural landscape of this area, but rather was influenced by the other anthropogenic changes. Livestock production has always been a main occupation, while cultivation focused on certain plant varieties, resistant to specific climatic and soil conditions. *“Today, more than 70% of the Metaliferi Mountains surface consists of pasture and hayfield”* (Gavra Camelia, 2012, p. 104) (fig. 2), although this percentage was higher in the past, caused by the predominance of livestock. In the present times, the wheat, the potatoes and less the corn are almost equally widespread (Plăiaș I., 1994).

The religious factor always played a role in the anthropogenic shaping of the landscape. Its presence is physically identifiable through places of worship. Those are some cultural elements, whose construction seemed to "explode" after 1850. There is no exact repertoire of these places of worship in the studied area, but exhaustive studies, focused on the Orthodox wooden churches of Alba and Hunedoara, leave a relatively clear picture of this process (Cristache-Panait Ioana, 1987; Jianu N., Lapteș M., 2004).

In the 19th century, there were two direct causes for the construction of new churches: the replacement of old ones, or their lack in certain places. First, demographic growth led to accumulation of capital in the community (a community with a high number of poor people is still richer overall than one with fewer poor members) and forced re-sizing the places of worship. Second, the events of the years 1848-1849 led to the destruction of many Romanian churches burned by Hungarian revolutionaries. Later, after 1870, the churches built of brick or stone became increasingly more common, even in villages, many of those built around 1900 being preserved up to present. The transition from wooden architecture to stone architecture had consequences on the cultural landscape: the stone churches being higher, became landmarks easier, visible from great distances and by the height of the towers, the bells' sound propagates at greater distances.

A phenomenon which marked the end of the modern era, manifesting itself in Transylvania beginning with the last decades of the 19th century, was the demographic revolution. It was characterized by a consistently lower mortality rate, while the birth rate remained high for another two decades, dropping to the new average only after 1910. This revolution has made the transition from the old demographic regime to the new one and its effects were felt in the Metaliferi Mountains area too.

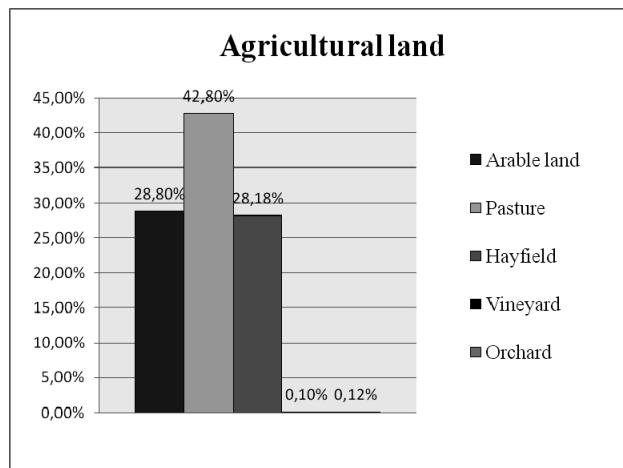


Fig. 2. Metaliferi Mountains.
The categories of agricultural land.

With regard to urban and semi-urban centers in the study area, the situation is shown below in table 1. It is necessary to specify that, for a greater relevance, the population refers to the whole administrative area of these settlements, not just the city itself and the data is exposed to the 2002 census, so one can follow the evolution in the long term (Varga E.A., 2010).

The demographic evolution of the main settlements from Metaliferi Mountains

Table 1

Settlement →	<i>Abrud</i>	<i>Zlatna</i>	<i>Roșia Montană</i>	<i>Brad</i>
Year ↓				
1850	4200	8141	5756	4031
1880	7462	7864	5640	4695
1890	7568	8098	5543	6018
1900	8318	8892	5665	7643
1910	7749	9519	5165	8163
1930	7122	9104	4362	7938
1977	5315	10027	4393	17077
1992	6729	9391	4146	18861
2002	6195	8612	3872	16482

It can be seen from the data above, that in the urban and semi-urban centers of the Metaliferi Mountains, the population grew differently during the 19th century. Thus, in Zlatna and Brad boroughs, the signs of a demographic revolution are identifiable in the period 1890-1910, after that a slight decline began. Regarding Abrud, the demographic revolution is identifiable in the decade 1890-1900. It followed the same trend as Zlatna, but with a higher ratio (about 50%). The last case, Roșia Montană commune, is illustrative for the way in which the figures can highlight only weak signs of demographic revolution. Between 1850 and 1910, the population decreased almost constantly, with a slight increase (120 individuals = 2.2%) and a maximum in 1900. Consequently, we may argue that, from 1890 to 1900, this phenomenon could be identifiable in the mining community of Roșia Montană, but without certainty of the truth, because of the high demographic fluctuation generated by migration.

One of the most important aspects that links history, geography and demography is that of transport and communication routes. In Metaliferi Mountains area, besides the old roads, in the late 19th century, a new kind of land transport appeared: railway. Initially built in mines, in order to ease the moving of carriages, rail began then to be used for people transportation, on local or regional routes.

In 1895, a narrow gauge railway from Alba Iulia to Zlatna (48.5 km) was put into use, facilitating the transport between the centre of Alba de Jos County and the mountain region. This line was functional until the years 1973-1976, when it was replaced by a standard gauge line, on a less deviated route (Bellu R., 2007). In 1912, the narrow gauge railway Turda - Câmpeni - Abrud (94 km) was also put into use. The third narrow gauge railway, linking Brad city and Crișcior village, is functional today, thanks to the efforts of the associations dealing with preservation of rail facilities. Between 1876 and 1896, the Arad - Brad railway was built, in several stages, the most spectacular achievement being the tunnel from Vârfurile (Neag R., 2004, p. 150-151).

4. CONTEMPORARY PERIOD

During the interwar period, the ore extraction went through a process of extensive modernization (pneumatic hammers, flotation installations, general ventilation installations etc.), which resulted in the rapid depletion of some old mines and the opening of new ones and of new drilling horizons. In parallel, extensive research works took place, in order to identify new veins. The "Mica" Company became the main industrial operator, investing in technology, and in the social and cultural communities of the miners, thereby constituting a real socio-economic lifting generator for the whole area (Neag R., 2004). The growth was also felt in the human component of the area, resulting in a substantial demographic increase, at least in the urban centers.

This period of time, positive on the whole, was suddenly interrupted by World War II, when resources were again directed towards the war industry. The decades that followed after 1945 brought with them major political changes, with profound implications on the social and economic level. The ideology of the new system was based on the idea of extensive industrial development and use of resources, thus impacting directly on the studied area, and acting as a pull factor. Ore exploitation was required from the USSR (the power that was controlling the communist regimes in Eastern Europe) too, because USSR had to recover "war debts".

The mining area which had the major gain from these changes was the city of Brad. The emergence of new enterprises, the new technology adopted and the expanding of old ones caused the growth in population numbers (due to migration from Moldova and Oltenia). The newcomers required new houses, which led to the building of blocks, thus deeply changing the old image of the city. Between 1948 and 1989, the larger part of the active population was working in industry and construction (R. Neag, 2004). Zlatna was also a highly industrialized city (mining and ferrous ore processing) in the communist era. Unlike Brad, a large number of employed people here consisted of commuters, not of immigrants, thus explaining the differences in population growth (Popa Maria, 2004).

Roşia Montană was not spared by the changes, especially after the nationalization laws from 1948, through which all means of production of the former operating companies became property of the state. In the years 1950-1960 a major mining process revamping took place. Later, in the 1970s, the ore exploitation on the surface (Cetate Mountain) began, increasing the production efficiency by 25-30 times. A copper processing plant was also built in Roşia-Poieni. After 1976, the implantation of other industries was attempted: in Abrud a mill factory was build and a clothing one in Baia de Arieş, but such enterprises did not change the essential character of the area – mining and ore processing. Other visible effects of the industrialization process were the concrete blocks constructions that changed the look of old towns (Sintimbrea A., 1989).

As for agriculture, the geographical specificity of these mountains did not stop the authorities from trying to impose collectivization. Its implementation led to major socio-professional changes in the countryside. After initially opposing the collectivization, peasants were forced to accept registration by various pressures, but concomitant, many have been attracted to work in mines (better remunerated). Consequently, the labor remained in agriculture was of poorer quality, which combined with low productivity and dishonest economic practices led to the failure of collective associations (Sicoie-Coroi Livia, 2009). After 1990, the industry experienced a major setback, for a time economic hopes heading to agriculture, specifically towards zootechnics – the most profitable

branch for mountain regions (Plăiaș I, 1994). But even today, after two decades, the lack of coherent programs makes the agriculture of Metaliferi Mountains an attribute of individual households and small and medium farms.

In terms of protecting the environment, the industrial decline was welcomed, especially for the ore processing plant in Zlatna. Its final closure in 2004 brought negative social effects, but had a positive effect on the residents' health and re-greening of affected areas (Popa Maria, 2004). The only economic sector that has developed, especially in the last decade, was that of tourism, due to the geographical diversity of the region, to the great tourist potential of the relief (Cocean P., 1984) and to the popular and historical traditions.

As a subdivision of the Western Carpathians (Carpații Occidentali), Metaliferi Mountains have always attracted the tourists, being suitable for development programs focused on this branch of economy. In this context, the latest cultural landscape elements have developed: the rural pensions. *"Having a relatively high density in some localities: Blăjeni, Buceș, Ribița, Bucium, Balșa, Almașu Mare, Băița, Zam"* (Costina M.I., 2003, p. 50), rural pensions are present in many villages of the mountainous area investigated. Their architecture is not uniform, depending on the owners' taste and presentation ideas: some are farmhouses adapted for tourist activities, others are new buildings constructed for this purpose. Especially the latter introduced some allochthonous elements in the local cultural landscape, through the eclectic style and chromatic, which combine local elements with Western European ones.

From this point of view, one can say that the Metaliferi Mountains area is still at an early stage in its search for a model: it remains close to traditional architecture and better integrated to local cultural landscape, but also provides the necessary facilities to attract tourists.

5. CONCLUSIONS

There is a clear continuity of habitation in these mountains, from prehistory to the present. Archaeological artifacts identified for all ages, and written documents, prove this reality, whose impact on the landscape and cultural landscape cannot be overlooked: in a discontinuously populated area, nature has time to return to its wild forms (before human habitation), while on a permanently populated area, nature suffers a constantly changing process through human intervention and adaptations.

Behind the continuity of habitation stand the rich soil and the subsoil resources, which have permanently attracted the communities and generated some specific demographic processes (difficult to reconstruct in the absence of censuses before the 18th century). The abundance of ores and the favorable microclimate conditioned the industrial profile of the region, focused on mining industry (in specific forms, adapted to different historical moments), then on the forestry and finally on agriculture.

The major changes of cultural landscape in the Metaliferi Mountains are related to extractive industry development, whether they belong to Roman, medieval or modern and contemporary epochs. The environment reorganization, the use of water force, the development of communications routes etc. are results of the processes through which man has used the nature and exploited its riches. Finally, all these premises have polished not only the physical landscape, the appearance of places, but also the "forma mentis" of people. The locals are individualized under the appellation of "moți" and recognized in the collective mentality register by their special qualities proved during historical turning points.

By mid-20th century the cultural landscape of the Metaliferi Mountains experienced a gradual but stronger anthropogenic modeling, in connection with the advance of mining techniques. Since 1948, an ideological component was added to technological modernization, which forced industrial development in an area that would have needed an economic balance and well-defined social policies. The forced collectivization experiment (which succeeded in form, but failed on the substance) put an end to traditional agriculture, creating by this a cut with the past. Its negative effects were felt after 1990, due to the lack of solid programs for mountain agriculture revival.

With the failure of major industries came the refocusing on traditional industries and agriculture, finally the tourism beginning to develop over the last decade. Although the latter represents an important generator of capital for this area, it is not yet coherently managed either from ecological or architectural perspective.

Today, Metaliferi Mountains form a geographical unit in which the nature, despite its wildness, is strongly shaped and influenced by the anthropogenic factor, in a less organized way than it would be desirable. Therefore, there are imbalances and abuses which, without the intervention of regulator factors, can lead to the irreversible destruction of local cultural heritage and landscape.

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THE SHEPHERDING IN THE MARAMUREȘ MOUNTAINS AND ITS ROLE IN THE LOCAL DEVELOPMENT

M. HOTEA¹

ABSTRACT. – **The Shepherding in the Maramureș Mountains and its Role in the Local Development.** Maramureș Mountains by their position in the Maramureș Land constitute from immemorial times a favourable space for shepherding. This study, part of a much more ample research, focuses on the analysis of this traditional economic activity and its role in the local development in the Maramureș Land. We have in view many aspects concerning the organization of the space with sheepfolds, rules concerning the order of the sheepfolds, the correspondence between the position of the sheepfold and the tourist roads, aspects concerning the capitalization of the products obtained as well the degree of use of the wool and the leather in the traditional costume and the way in which is reflected in the welfare of the population. We analyzed too aspects concerning the system of the sheepfold organization and the migratory flows that are realized from the considerable distance. This work tries to present progressively these aspects beginning with 14th century (the first written documents) to the present.

Keywords: *local development, sheepfold, shepherding, welfare, Maramureș.*

1. INTRODUCTION

The Maramureș Mountains, situated in the northern group of the Eastern Carpathians, at the north border of Romania, cover an area of 168 814 hectares. At the end of 2008, the total population was 87 525 inhabitants within 8 rural municipalities (Moisei, Vișeu de Jos, Leordina, Petrova, Bistra, Ruscova, Repedea, Poienile de Sub Munte) and two towns (Borșa and Vișeu de Sus).

Within this space, shepherding is a very old activity, with typical forms of organization having a sedentary character and a very old terminology. The archaeological discoveries and the medieval documentary attestations regarding pastoral life do not offer much information, probably because most of the tools and buildings were exclusively made of wood and they have not left well preserved traces. Only starting with the 13-14th centuries appear the first mentions (diplomas or documents of sale) regarding the hay fields and the pastures. The alpine pastures of the Maramureș Mountains offered exceptional conditions for breeding sheep, which were kept, in a pasture area for the summer in sheepfolds which are called in the 14th century documents from Maramureș “loci estivales” or “descensus in alpihus” (Mihaly de Apșa, 1900).

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In the 14th century, it is not certain if cattle were kept for the summer on the alpine pastures, as it happens today in most of the villages, which is due to the extension of the arable lands in the detriment of low altitude pastures. According to the information given by documents, grazing in the mountains seems to have been limited to sheep and the number of sheepfolds was more reduced than it is nowadays. According to Radu Popa (1997), the giving of the sheep to a shepherd or “quincuagesima ovium”, which is a service in products of the Romanians reflects exactly the differences between the branches of economy as far as the making of some products which are beyond the needs of rural communities is concerned. The giving of sheep to a shepherd dates back in Maramureş to 1360 and to the middle of the next century. The importance of breeding sheep within the economy of Maramureş had as a result also the separation from the limits of the village of some mountains with pastures which have begun to appear as distinct properties since the 14th century. The mountains were considered as part of the village land even when they were not a common body with the village land and were at great distance. It is not known if the separation of the mountains from the village land and their distinct patrimonialisation began with the alpine pastures geographically separated from the village, although it is natural that this process might have had such an evolution. Thus there are pastures which although are inside the administrative territory of a certain settlement, they belong to other village or persons from other villages.

2. MATERIALS AND METHODS

The information for this study was collected in 2008. In analyzing the elements of shepherding, an important traditional economic activity in the local community, we used statistical information from the municipalities of the Maramureş Country, Statistical Institute from Baia Mare, historical documents and an immense field work.

3. RESULTS AND DISCUSSIONS

The shepherding in these mountains is favored by the existence of a favorable land cover in which the pastures and hay fields account for 50 250 ha which represents about 30% of the total area of the present study (14.46% pastures and 15.30% hay fields) and the wooden area represents 65.03% (fig. 1).

The arable land is under 5%. By studying the structure of the agricultural fields in 2008, we notice for each municipality in the study high ratios of the pastures and hay fields. The largest surface of pastures are found in Borşa (over 8000 ha), Poienile de Sub Munte (about 4000 ha) and Moisei (3358 ha). The vineyards are not present in Maramureş Mountains and the orchards have an insignificant ratio, 91 ha which is 0.05% of the total surface (fig. 2).

Regarding the type of shepherding, in the Maramureş Mountains there is a pendulous shepherding - simple or double - imposed by the fact that the number of sheep exceeds the foddering possibilities offered by the natural pastures existing in

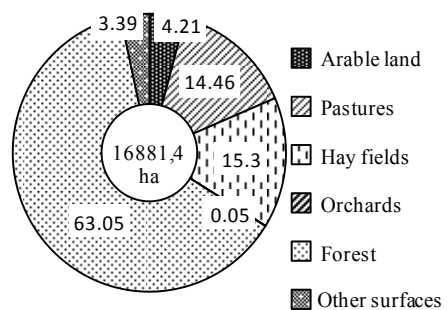


Fig. 1. The structure of the land cover.

the limits of the villages. The pendulating of the sheep take place within two areas: the first, in the limits of the village, on arable lands and pastures, and the second in the natural pastures high in the mountains. Besides the economic purposes (dairy products, meat, skin, wool etc) a permanent manuring of the lands is achieved. The grazing of sheep on the mountains lasts generally 4-5 months, according to the altitude of the sheepfold, beginning with the end of May and until the beginning of September in the alpine area, or until October at lower altitudes, when the summer grazing season actually ends (from the 23rd of April, the celebration of St. George, until the 26th of October, the celebration of St. Demetrius).

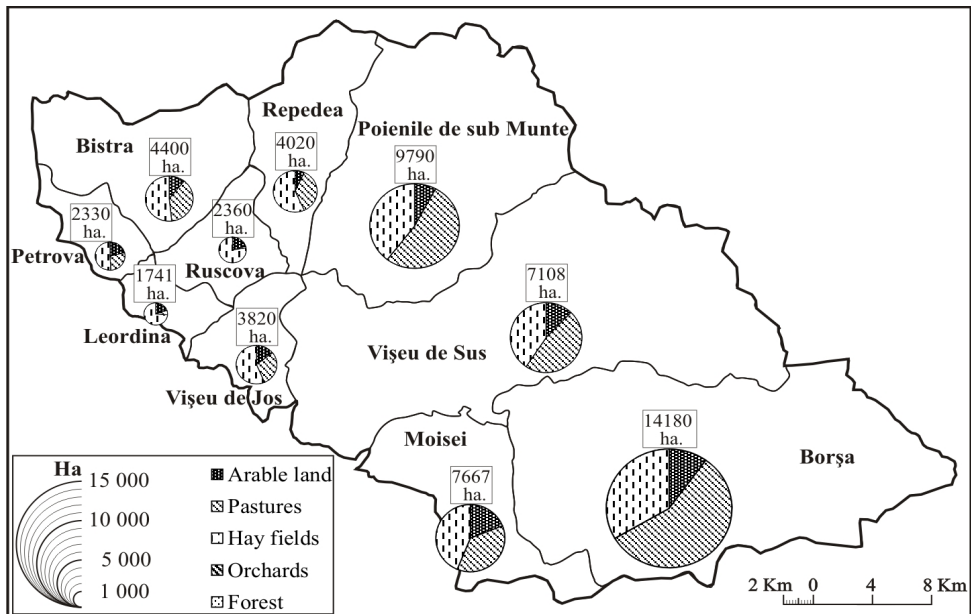


Fig. 2. The structure of the agricultural lands by municipalities.

In the case of simple pendulating shepherding, the sheep pendulate every pastoral year between the village and the mountains to be kept for summer, but they always spend the winter in the villages of origin. In spring, sheep graze on the hay fields or on arable lands (except for the lands with wheat, clover and alfalfa). Once grazing in these areas stops, generally in the first decade of May, there take place the “sâmbra oilor” or “împreunatul” (the process of mating), an ancient pastoral habit with multiple social and economic significances. The leaving of sheepfold for the mountains is thus celebrated by a rustic celebration somewhere not far of the centre of the village and all the sheep owners’ families and other guests take part at this celebration. On this day the measuring of the milk for each sheep is done, and based on this measurement the owner will receive a certain amount of cheese.

The double pendulating shepherding, an original form of Romanian pastoral life is more complex than the simple pendulating shepherding. In spring sheep graze within the limits of the village or on the hay fields just below the forests, in summer on the alpine

pastures, in autumn the sheep gradually descend to the hay fields below the forests and from there to the meadows surrounding the villages, and in winter sheep again ascend near the summer pastures in the area of mountain hay fields (900-1300 m), where the hay was mowed during summer but could not be transported down to the village. This type of shepherding has in fact two circuits, of which one has a larger extension: village limits – area of summer grazing – village limits, and another circuit which is more reduced: village limits – area with hay fields – village limits. This pendulating shepherding is conditioned firstly by the gradual development of vegetation on altitude and secondly by the existence of fodder for animals during winter time.

As far as the place and manner of locating the sheepfolds is concerned, they are established by the head shepherds. As a rule, the sheepfolds are located depending on characteristics of the local landforms from 600-700 m up to 1900 m. In most cases, the sheepfolds are located near forests, surrounded from three parts by forest, or in the glades from forests, or near springs or other water sources (streams, glacier lakes), on a sunny place especially with a southern exposure and extremely rarely with a northern exposure, on an elevated terrain on a slope not too steep; near roads or other means of access. Many sheepfolds are located on tourist trails or near them thus becoming a place of halt for tourists or even a place of spending the night as well.

The number of sheep has grown in the last hundred years, more than threefold from 13277 sheep in 1895 to 51500 in 1989, and presently there are 34948 in 2008. However to this number of sheep, one may add another 9974 sheep from villages which do not belong to the area of the present study, but whose sheepfolds are located in this area during summer (28 sheepfolds). Thus the total number of sheepfolds is 95 and the total number of sheep is 44922. The average density of sheep on the agricultural land is 78.18 sheep on 100 ha of agricultural land. On figure 3 it can be noticed the fact that the largest number of sheepfolds belong to Poienile de Sub Munte (23). Out of these, only 8 are from this municipality, the rest belonging to other municipalities. In summer, many sheep both from the Maramureş Mountains and from greater distances, come to this municipality for grazing. From the Iza Valley, there are three sheepfolds from Bârsana and a sheepfold from Strâmtura, but sheepfolds also belong to other distant places, from the Mara drainage basin (Călineşti, Berbeşti, Vadu Izei) and from Rona de Sus on Ronișoara Valley as well. In the municipality of Repedeă, there are also a number of sheepfolds both from the valley of Iza (Bârsana and Strâmtura) and the Valley of Ronișoara (Rona de Jos). To Vișeu de Sus usually come sheepfolds from closer settlements situated on the upper basin of Iza (Bocicoel, Bogdan Vodă, Sălișteea de Sus). An important fact is that to Borșa come 12 sheepfolds which do not belong to the area of the present study - from Rozavlea, Sălișteea de Sus, Săcel and Ocna Șugatag - which is quite far away.

These pendulating flows have taken place for hundreds of years. The number of people involved in these activities is 524 persons, exclusively men. The transportation of sheep is done on foot and usually lasts between 24 and 40 hours depending on the distance. The shepherds have regularly used the same trails for centuries. Thus the localities from the Valley of Vișeu but more important those from the Valley of Iza, where there is a lack of pastures send their sheep towards the Maramureş Mountains using the roads that follow the Vișeu, Țâșla, Vaser and Ruscova rivers. In this way, some toponyms linked to the sheep transportation appeared: for example, the road that links Bârsana to Petrova goes along a valley called the *Valley of the Mountain*, and the hamlet situated on the road bears the same name.

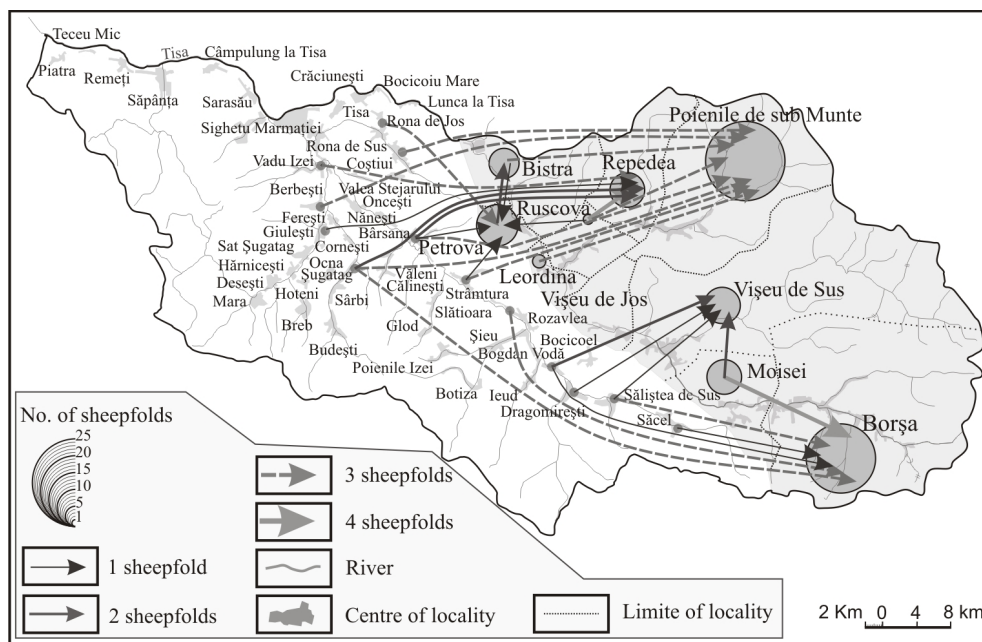


Fig. 3. The flows of sheepfolds towards the Maramureș Mountains.

The sheepfolds of the Maramureș Mountains are made up since the old times by the association of several small owners of sheep called “sâmbrăși”. In the past, the cases when great sheep owners had their own sheepfold were very rare. The sheepfold owner has between 100-200 sheep and the average for the small owners, the “sâmbrăși”, is 5-10 sheep. Initially, in spring, sheep are gathered in herds of 50-150 called “boteie” which are given to a shepherd. After that in May when the “ruptul” or “sâmbră” takes place, these small herds (“boteie”) gather at the “sheepfold” (300-500 sheep, it is unusual to be more than 600 sheep) and the responsibility of the sheep is given to the host of the sheepfold. The host of sheepfold is chosen by the sheep owners using different criteria: he has the greatest number of sheep; he is the owner of large pastures; he is hardworking and trustworthy. He exerts his direct authority over all the members of the sheepfold.

The staff of a sheepfold is made of the “baci” (he is the leader or the most important character in a sheepfold; as a rule he is an elderly man, hardworking and knows the mountains and the places of grazing very well), the shepherds or “păcurari” (their main responsibility is guarding the sheep), “strungași” - they are on the lowest scale of hierarchy in a sheepfold; as a rule they are young and put the sheep in pens. Sometimes, they willingly accompany the sheep on the pastures, guard the sterile sheep, or attend to the housework things from the sheepfold.

Shepherding is an economic activity whose sphere does not limit to breeding cattle or sheep but it also deals with the capitalization of animal goods. As pastoral life goes on, most often, outside the limits of a village, at great distance from the centres of village, it is natural for the milk to be processed at the sheepfold, the processed products –green ewe cheese or soft cottage cheese – are meant to supply the daily needs of a sheepfold, and the rest of the cheese is meant to be commercialized. The procedure of making green ewe cheese

and other dairy products as well the pots from the sheepfold are specific to an ancient pastoral type, the techniques used are ancient as well. The average amount of cheese given by a sheep is 8-14 kg and the total amount of cheese made throughout the Maramureş Mountains has an average of over 250 tons. The dairy products are capitalized in the town markets of Vişeu de Sus, Borşa and Sighetu Marmaţiei and the largest amount is given to the factories which process milk from Vişeu de Sus and Borşa, but these factories pay for the dairy products 25-35% less than on the free market. The predominant breed is the "ţurcana" (tzurcana sheep) whose production of wool is 2.5 – 4 kg yearly. Wool is largely present in the traditional costumes of both men and women, traditional costumes which are still worn in this area. From wool and sheep skin, modern clothes are made also (sweaters, or "irha" which is a warm winter coat). It must be said that the traditional costumes are home made with technical devices.

4. CONCLUSIONS

As a conclusion it can be said that although the geographical specific features of the mountainous landscape are not entirely favourable for the development of the local communities, the shepherding in the Maramureş Mountains finds excellent conditions for developing and finally these conditions have a positive influence on all the area by the products created. The purpose of this activity is to satisfy the needs of a household and the excess is capitalized to satisfy other needs.

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THE DEVELOPMENT OF THE ROMANIAN VOCATIONAL EDUCATION AND TRAINING SYSTEM

SILVIA IRIMIEA¹

ABSTRACT. – **The Development of the Romanian VET System.** Vocational Education and Training (VET) has become a major education sector under the coordination of the European Commission. National VET policies are worked out in every country. In this context, the Romanian VET system has undergone a major improvement due to a reform carried out in the post-Copenhagen and Lisbon period. The reform was primarily aimed at the alignment of the Romanian VET system to the European VET policy. The study is aimed at charting out the current state and trends of VET in Romania. While some aspects are discussed, suggestions for improvement are also provided. The research relies on the documents of the European Commission on VET, The Barcelona Declaration 2002, the Copenhagen Declaration 2002, the Helsinki Communiqué 2006, The Lisbon Integrated Guidelines for Growth and Jobs 2005-2008, and finally, on the Common Quality Assurance Framework (CQAF), on ECVET, on adult education and continuous education. The study is a synchronic analysis of VET in Romania. It first outlines the system with its components, the laws, institutions, providers and the links between them. The study moves then to a discussion of some aspects which necessitate reconsideration or improvements. The discussion reveals approaches *vis-à-vis* VET which result from international Leonardo da Vinci exchange projects.

Keywords: *Vocational Education and Training, providers, curriculum development, evaluation, quality assurance, NQF, ECVET.*

1. INTRODUCTION

Over the last two decades, substantial development in the field of Vocational Education and Training (VET) has been made, whereby all components of the system have come under thorough scrutiny. Following the European Commission recommendations, national VET policies have been worked out in every country. The Romanian VET system has undergone a major improvement through a reform carried out in the post-Copenhagen and Lisbon period. The reform was primarily aimed at the alignment of the Romanian VET system to the European VET system.

Since 1997, attempts have been made to complete the transition period in the domain of education. The reform was meant to be comprehensive, capable to affect the entire structure of the education system at the level of content, education institutions, financing and regulations. Consequently, the legislation in education for the period 1990-2000 was aimed at the introduction and translation into legal terms of the

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curricular changes, of the evaluation of knowledge and institutions, of the infrastructure and computerization of education, of the domain of financing, of the teaching staff status (statute), of continuous professional training and of lifelong learning education.

The fact that the regulations adopted by the Government (Ordinances and Decisions) and those issued by the Ministry of National Education (Orders) are much more numerous than those passed by Parliament is indicative of the intention of the Ministry of National Education to resort to shortcut strategies for control purposes. Consequently, the legislative framework came to be at the same time both dynamic and loose.

The *Romanian education system* is based on a tuition-free, egalitarian system. Access to free education is guaranteed by Article 32 of the Constitution of Romania. Education is regulated and enforced by the Ministry of Education and Research. Each step has its own form of organization and is subject to different laws and directives. Since the downfall of the communist regime, the Romanian education system has undergone several reforms which have improved the system and aligned it to the European area of education.

The study undertakes to examine the system along with its components and discuss a few aspects which could be improved. The study goes out from a synchronic survey of the Romanian VET system including: the Law of Education, the governmental authorities, institutions and providers. The present status of quality assurance in VET is based on the research of the available materials published or released by ministerial authorities or gathered from EU project reports on European Commission ECVET achievements.

The study surveys succinctly the achievements of the Ministry of Education through its VET National Council for Adult Education, the outcomes of Romanian's involvement in EU projects concerning the establishment of a quality assurance system in VET. Following the findings, the study sets forth some suggestions regarding the implementation of a rigorous quality assurance system and ways of communicating the outcomes to the providers. The suggestions for the improvement of the quality assurance system stem from the research work for a European Leonardo da Vinci partnership project, which is coordinated by the author of the study.

2. RESEARCH CONTEXT

The paradigmatic context for the study has been provided by the documents of the European Commission on VET, the Common Quality Assurance Framework (CQAF) on quality assurance, ECVET, adult education and continuous education including: The Barcelona Declaration 2002, the Copenhagen Declaration 2002, the Helsinki Communiqué 2006, The Lisbon Integrated Guidelines for Growth and Jobs 2005-2008, and finally, the European Parliament and Council Recommendation on the establishment of a *European Quality Assurance Reference Framework* for VET of 18 June 2009, and Annexes 1 and 2.

Of major importance for any study, including the present one, are the bulletins and works published by the European Centre for the Development of Vocational Training (CEDEFOP), whose role is to oversee the development of VET Europe-wide, to provide reference materials, information, analyses and reports of training systems, policies, research and best practice case studies. Since its establishment in 1975, the CEDEFOP has successfully directed and monitored VET through several efficient tools and an enthusiastic team of

highly qualified experts. The present efforts of the CEDEFOP are oriented towards reflections on VET reform in the interval 2002-2010, on (1) the achievements of European cooperation and its impact, (2) changes regarding the skills needed on the European labour market, (3) developing and improving skills adapted to a new low-carbon and green economy, (4) the quality in VET systems, on approaches to the improvement of training policies, etc. For the period 2009-2011 CEDEFOP objective is to: inform European VET policies, interpret European trends and challenges for skills, competences and learning, assessing VET's benefits, and raise the profile of VET (Zachilas L., 2011).

Further input came from the Romanian education policy documents: the Law of Education, rules and ordinances issued by the Ministry of Education or other lower level authorities.

3. THE ROMANIAN EDUCATION SYSTEM

The Romanian education system is designed in compliance with the following laws, rules and regulations which guide and control it. The education system is governed by the following *types of laws*:

- the Constitution of Romania, passed in 1991;
- the organic law of education (Education Act 84/1995);
- common specialized laws (including: Act 88/1993, regarding the accreditation of higher education institutions and the recognition of university diplomas, the Statute of the Teaching Staff no 128/1997);
- government decisions having the force of Acts of Parliament over an established period;
- orders of the Minister of Education.

The national education system includes public and private education units and institutions, has an open character and assures the transfer from one system to another under the conditions stipulated by law.

In Romania, kindergarten is optional under the age of six. At the age of six, children must enroll for the "preparatory school year", which is mandatory for admission in the first grade. Schooling starts at the age of seven, and is compulsory until the tenth grade (which corresponds with the age of sixteen or seventeen). The school cycle ends with the twelfth grade, when students graduate the baccalaureate. Higher education is aligned to the European Higher Education Area.

The obligation to attend school is established by the Constitution (article 32) and by the Education act. Article 15 of the Education act stipulates that general compulsory education includes *primary education* (grades 1-4) and *lower secondary education* (grades 5-8). Compulsory education begins with the first grade of primary school, where pupils can be enrolled if they turn 7 during the same year. At the parents' or the legal trustees' request, children who turn 6 by the beginning of the respective school year can be enrolled on condition that their psychosomatic development meets the required standards. For children who, for various reasons (social or health problems), have not finished the first four grades of compulsory education by the age of 14, "second chance" forms can be provided. Compulsory education (grades 1-8) normally ends by the age of 15. It ends up with a "capacity examination", which entitles the pupil to continue its studies in the **post-compulsory education system** or to enter active life.

Exceptionally, for those who are more than two years older than the average age of the respective grade, lower secondary education (grades 5-8) can also be organized or made available under the form of *evening classes, part-time education* or *distance education*.

4. THE ROMANIAN VOCATIONAL EDUCATION AND TRAINING SYSTEM

The objective of VET (vocational education and training for adults) is to provide the necessary knowledge to adults in order to assist them in finding a job or developing their own vocational career paths. To this end, national policies are worked out in every country. The Romanian VET system has undergone a major improvement through a reform carried out in the post-Copenhagen and Lisbon period. The reform was primarily aimed at the alignment of the Romanian VET system to the European VET system.

4. 1. Representative organisations for vocational adult training

In Romania the organisations which are responsible for VET are:

- *The Ministry of Labour and Social Solidarity* whose responsibilities are to elaborate policies and programs in the field of vocational training and control the way in which these programs are implemented;

- *The Ministries of various economic and social sectors* which seek to ensure the continuous vocational training of the employees who operate in these sectors;

- *The National Council for Vocational Adult Training*, a council which works under the Ministry of Labour and Social Protection and the Ministry of Education, determines the medium and long term needs of vocational adult training and collaborates horizontally with others organisations involved in vocational adult training;

- *The National Agency for Occupational and Vocational Training* is a national public institution whose role is to organise and finance employment-related services. In addition, it also acts as a mediator between employers and the people who need a job and administrates the budget for the payment of unemployment benefits;

- *The Council for Occupational Standards and Certification* is a national organ which elaborates and approves new occupational standards or modifies and cancels the existing ones. Its role is to represent and support Romania's interest regarding the certification of vocational competences at a international level;

- *The Commissions for Authorization of Training Providers* is in charge with the authorization of the training providers whom they provide with counselling and all the in-training they need and also monitors the latter's activity.

4. 2. Adult education providers

In Romania there are two kinds of training providers: *public providers* and *private providers*. Public sector providers are represented by *schools* subordinated to the Ministry of Education which offer courses to the benefit of enterprises, and *vocational/vocational training centres*, whose role is to train, re-train or offer second chance education opportunities to individuals, especially to the unemployed. Private sector providers are vocational training centres, subordinated to the Chambers of Commerce and Industry, to foundations, associations and economic operators.

Regardless of the form, the providers are all subordinated to the Ministry of Education or the Ministry of Labour and their appropriate councils or commissions.

4. 3. Forms of adult vocational training

The main forms of adult vocational training are: initial, qualification, further education, specialization and re-qualification, where:

- *initial training (basic training)* is aimed at the attainment of a minimum amount of knowledge necessary for the completion of a low-level vocational activity. This form of training leads into a certified qualification;
- *qualification training modules* offer a limited range of vocational competences which enable an individual to undertake and carry out certain activities;
- *further training/education* contributes to the development and consolidation of vocational competences related to the same qualification;
- *specialization courses* seek to develop vocational competences in a restricted field of activity;
- *re-qualification modules* are second chance training opportunities oriented towards the acquisition of job-specific competences.

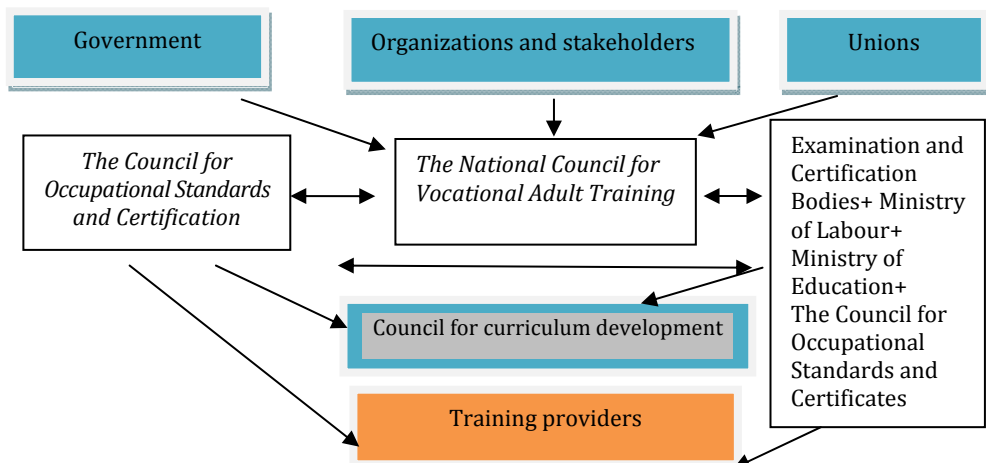


Fig. 1. The curriculum design process (CNFPA Report, 2002:34).

4. 4. Curriculum development for VET and adult education

The development of the curriculum for continuous vocational training is highly regulated and centralised. Thus, most providers use the national standards for vocational training issued by the National Agency for Occupation and Vocational Training.

At present, synergies are put into broad projects which target the design of a curriculum for adult training in alignment with the European international standards. As in most European countries, the curricula are designed after the National Qualifications Framework(NQF), which, in turn, is aligned with the European Qualifications Framework (EQF).

4. 5. The evaluation and accreditation of the knowledge and competences acquired through VET

In order to enjoy a nation-wide recognition, the acquired vocational knowledge and competences must be formally certified by the Ministry of Education and by the Ministry of Labour and Social Affairs. In the case of VET courses, the evaluation of knowledge and competences is carried out both throughout the entire training period and at the end of a module, through a graduation exam which can consist of either 1) a theoretical and practical test or 2) a practical test.

Upon completion of the training module, the graduates pass their final examination and are awarded a qualification or graduation certificate, enabling them to practice the profession they qualified for. These certificates have a nationwide validity and can also be used to acknowledge the qualification for a given profession in the context of international agreements concerning the temporary mobility of work force.

The most common form of evaluation is that aiming at the assessment of knowledge and competences in relation to the taught syllabus. This assessment has a twofold function: on the one hand, it allows the evaluation of the rapport between the outcomes of the vocational training and job requirements, and on the other, it enhances the validation of competences regardless of the way in which these were acquired, i.e. formally, informally or non-formally.

The received vocational competence certificate can, undoubtedly, increase the chances to a career development and at obtaining a job.

4. 6. The connection with the initial vocational training within the education system

The representative organisms dealing with this type of training are: the Ministry of Education, the county school inspectorates, the local committees for the development of social partnership and the National Centre for the Development of Vocational and Technical Education.

Initial vocational training is carried out in accredited public or private institutions, organized by the Ministry of Education or at the initiative of enterprises. The content of the training program is tightly connected to the labour market demands and needs, depending on a broad range of occupations and is achieved through the following forms of initial training:

- *apprenticeship schools*, where admission requirements consist of: completion of basic, compulsory education, with or without a certificate;
- *vocational schools*, where admission requirements include: completion of basic, compulsory education, with a certificate;
- *technological and vocational high schools*, which is both a general and vocational type of training, facilitating access to the labour market as well as to higher level studies;
- *post-high schools* for which the requirement is the completion of high school training.

The national curriculum for the initial VET modules comprises curriculum frameworks, syllabuses and the teaching material, all contributing to the achievement of the established training objectives.

The evaluation and accreditation of the knowledge and competences acquired through initial vocational training is consists of *graduation exams* in vocational education organized and coordinated by the National Commission for Evaluation and Accreditation, which is set up every year and functions under the Ministry of Education. Examination commissions are appointed at the level of each education unit.

The Council for Occupational Standards and Accreditation (COSA) plays an important role in devising a new system of evaluation and accreditation for vocational competences based on occupational standards. The new system takes into account the evaluation and accreditation of competences regardless of the way in which these were acquired throughout the formal VET system, independently or at work.

The participation in the new system of evaluation and accreditation is voluntary and the certificates released under the COSA authority are additional to the diplomas awarded by the education units.

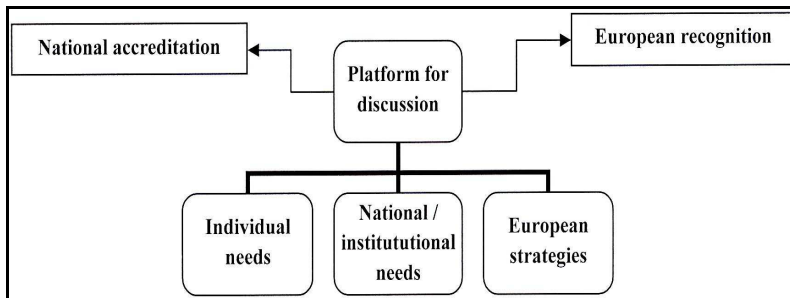


Fig. 2. The Romanian accreditation process.

The accreditation of various training modules has been conducted in parallel with the international recognition thereof. The Centre for Tourism Training has participated in three Leonardo da Vinci projects which sought to ensure the recognition of certificates in partner countries.

5. DISCUSSION

The current education-related topics on the EU agenda, following from the Copenhagen Process and the Bruges Communiqué, are focused on increasing student mobility, promoting social cohesion and active citizenship, building the European Credit Transfer System for VET (ECVET), utilizing the European Qualification Frameworks (EQF) and developing European approaches towards quality assurance.

On international level, a system has been created which allows the identification of education levels for all forms of learning available in a system. This system is called the *International Standard Classification for Education*. The forms of education provided for different levels inherent to the Romanian system of education are represented in the chart below.

ISCED	Level		Form
0	Pre-primary		Pre school
1	Basic education	Primary education	Primary schools
2	Lower secondary	General education which leads to continuation of education	Comprehensive schools: gymnasium
		2.A Pre-vocational education which introduces the learners to work	
		2.B. Pre-vocational education which prepares learners for technical and professional education	
		2.C Professional education which develops practical knowledge and competences	
3	Upper secondary	3.A general education which introduces the learners to work	High-school
		3.B Pre-professional education which prepares learners for work for technical and professional education	Technological high school
		Professional education which develops practical knowledge and competences	Vocational institutions
4	Post secondary education	4.General education programmes /pre-technical education professional for ISCED5	(Special vocational institutions)
		4.B Education for labour market	Post-high school
5.	First level of tertiary education	Bachelor's degrees	Universities
		Bachelor's degrees	Colleges
6	Second stage tertiary education	Doctoral degrees	Colleges

ISCED = ISCED classification

Fig. 3. The Romanian education system.

The general interest for VET in Romania is still very low, as most of the basic education leavers choose higher education instead of a vocational form of training. This is a pattern which has deep roots in the Romanian education system. In other European countries such as Finland, the number of students with a vocational qualification has increased in 2008 to 42% of the youngsters who completed their compulsory basic education and is increasing. In Finland the demand for VET cannot be satisfied. Hopefully, in the near future, following a sustainable education policy, the odds will change in Romania in favour of VET as well.

It should be, however, noted that although the levels permit access from one level to another, there is little flexibility for vertical and horizontal mobility between the vocational levels and vocational and HE. For example, a graduate from basic education or a baccalaureate holder is unlikely to move on to level 5 of a bachelor degree, partly because this career path is not very much opted for. This is the result of a particular

career pattern used for several decades by school leavers, a path which goes from basic education straight on to a form of VET and then on to the labour market. In addition, learners are not accurately informed about their options and vocational career paths which may lead to college or university degrees.

The transition from one level or from to another is represented below.

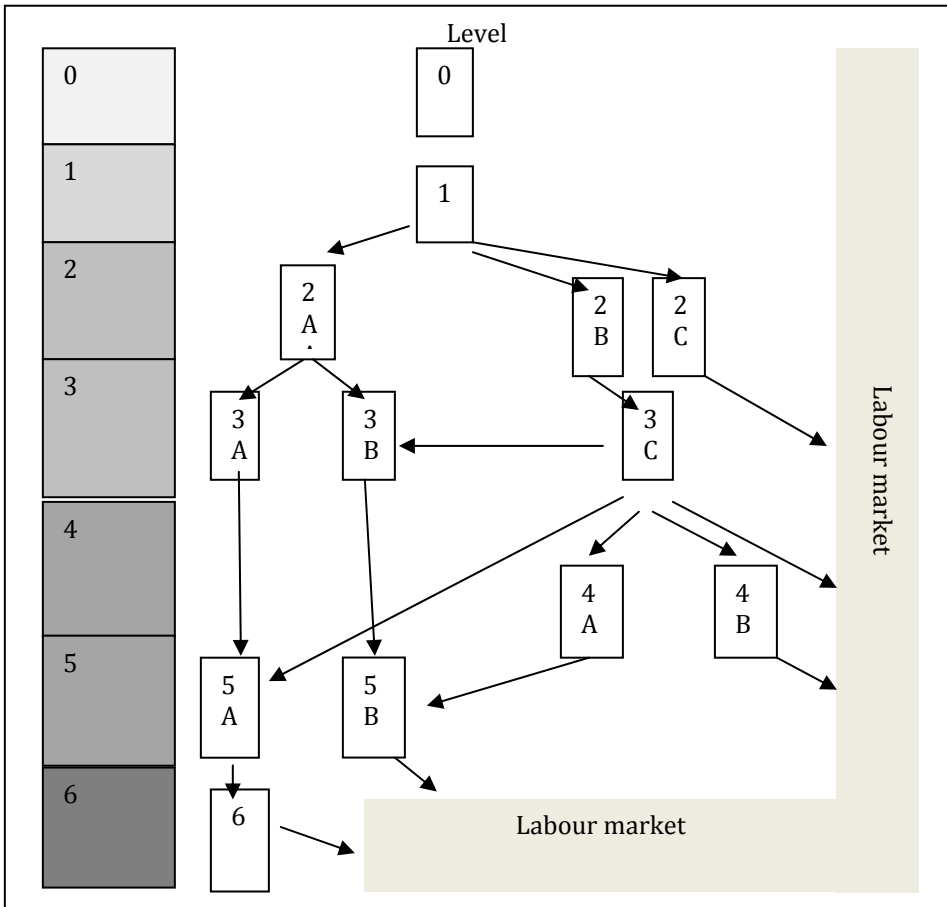


Fig. 4. The transition from one level to another (CNFPA Report, 2002:38).

Besides, VET career routes are not very much promoted and made attractive to the learners. The lack of attractiveness also accounts for the low number of students who opt for a vocational qualification. In countries like Finland VET has become very friendly and attractive through international mobility opportunities, 30% of which were undertaken under the Leonardo da Vinci programme frame and were awarded mobility certificates.

Another way to make the VET area more attractive is through offering more on-the-job training as a result of a closer and more efficient collaboration between VET providers and the economic environment. Thus, the connection to companies is an area that is similar in VET in all countries and the problem seems to be how to interest and engage companies in VET training in cooperation with training providers or schools. There are many best practice examples from countries like Ireland and UK but Europe-wide other countries are also engaged in the process of bringing companies in their region closer to VET schools. Although the Romanian VET system relies heavily on this collaboration, the enterprises are very often reluctant to offer placements for the students. In addition, placement enterprises must also appoint a placement coach to mentor and monitor the student's progress. In this respect, there are many best practice examples in Romania, but, in general, as mentioned above, enterprises sometimes resist to the collaboration with schools.

VET cannot be attractive unless it is innovative. Equally, it cannot meet the skill demands if it does not seek to permanently innovate the process. It follows then that training providers should necessarily develop innovative programs and teaching and learning strategies both to attract more business and to make teaching a friendlier place for students.

One of the reasons why VET is underrated in Romania might be that little is done in the direction of qualification foresight or anticipation. In Romania training providers are too much concerned with training and hence are tempted to ignore foresight analyses, while other institutions or authorities involved in the process are less eager to carry out research in the field. Any healthy education system should be able to anticipate the future skills which will be needed by the labour market. In this respect, the present efforts of the CEDEFOP in the context of world recession are aimed towards changes regarding the skills needed on the European labour market, on developing and improving skills adapted to a new, more demanding, economy.

Teacher training is extremely important as trainers are key actors in achieving high quality learning outcomes. Teachers enjoy a twofold status: both as professionals and stakeholders. CEDEFOP under the auspices of the EC undertook to develop the: CEDEFOP's network on training the trainers. The network brings together 22 countries and 3 thematic groups focused on: leadership, mentoring, in-company trainers. Amongst the topics addressed are: (1) professional development of T&T: initial, CPD, induction; (2) changing roles and competences; (3) leadership; (4) T&T and learning outcomes; (5) T&T and quality.

CEDEFOP has worked out and published some studies which are instrumental for trainers who wish or need to update or develop their expertise. They include:

- *Competence framework for VET professionals. Handbook for practitioners*, 2009;
- *Professional development opportunity for in-company trainers – a compilation of good practices*, CEDEFOP 2010;
- *Learning while working*, CEDEFOP 2011;
- *Updating vocational skills of VET teachers*, CEDEFOP, 2011.

These materials are available online and accessible to all trainers who are interested in the developing their expertise. The opportunities for development are provided by the Leonardo da Vinci programmes, which trainers also have access to. The question that arises is to what extent are these efforts of the CEDEFOP known by vocational trainers in Romania and capitalised. A further question that arises is how are the *train*

the trainers opportunities promoted in Romania. The answer to these questions goes without saying. The opportunities are little known by the trainers or the training providers, who do little to make these opportunities accessible and used by their staff.

The present global recession, the economic and labour market pressures affect the Romanian VET providers in several ways: (1) decreased interest in education and fewer young people capable of paying for their professional qualification, (2) less interest on the behalf of organisations to support further training of their staff, (3) work opportunities for young people dropped resulting from a decline in the rate of employment growth, (4) reductions in apprenticeships and traineeships following falls in investment by firms in education and training, (5) major job losses in industries and occupations triggering fluctuations in the labour market. All these recessionist effects threaten the revenue of providers who are highly focussed on a rather market-based, fee-for-service delivery.

Improving the *quality of VET* is another priority of the European countries committed to implement the Copenhagen process, which could be achieved through developing evaluation mechanisms, through improving initial and continuing training. If, in general, countries and different social partners or public partners assess the process positively, in terms of real achievements, such as: acting upon common principles and national priorities and developing common European instruments or principles, in what the outcomes of the process are concerned, some countries view them differently. In spite of the general consensus that significant progress has been made in the direction of changing national VET systems and lifelong learning policies, some still regard the outcomes as moderate, since they have not changed the national policies significantly. The optimists, however, would agree that more time is needed for such major changes to take effect. A *Briefing note of the CEDEFOP (December 2010)* admits that 'there are also encouraging signs. Despite the economic crisis, all of the benchmarks show improvement in 2009 compared to 2000.

Quality assurance has been devised by the EC through documents and tools like: the Common Quality Assurance Framework (CQAF) on quality assurance, EC/VET etc reflected in: The Barcelona Declaration 2002, the Copenhagen Declaration 2002, the Helsinki Communiqué 2006, The Lisbon Integrated Guidelines for Growth and Jobs 2005-2008, and finally, the European Parliament and Council Recommendation on the establishment of a *European Quality Assurance Reference Framework* for VET of 18 June 2009, and Annexes 1 and 2. Although in many European countries the role of Ministries or National Boards is to set objectives for VET provisions and its quality and to ensure that these objectives are achieved, the Romanian providers know again little about their obligation to observe and conduct quality assurance policies. So far, quality assurance for VET is a recommendation, which in real terms cannot or is not fully achieved. The providers which implement and control quality assurance policies are the ones which are involved in national or European projects, while the other providers are not concerned with such measures. The Ministry of Education through its boards and councils recommend, though, measures and develop tools to support the system for assuring quality standards, but each provider can then decide on how to implement the recommendations in practice. The European Quality Assurance Framework is at the availability of all providers who visit the EC or the CEDEFOP sites, but is not expressly released and transmitted to providers, who most of the time have to discover themselves what norms they need to follow.

The adoption of National Qualification Frameworks has become another major objective of the EC. The CEDEFOP has, in general, concluded that the Copenhagen process has been a success because of several factors. First, several countries have voluntarily agreed to cooperate and act on the Copenhagen directive towards developing common European instruments. Alongside working on developing common instruments, an increased number of countries have developed and introduced *National Qualifications Frameworks (NQFs)* which reflect national traditions and structures. Some countries see the NQFs as means to develop the link to the EQF. However, the role of NQFs is instrumental for the adoption of the learning outcomes-oriented approach, towards working out more comprehensive NQFs capable of encompassing all levels of qualifications, whereby NQFs appear as valuable communication and transparency tools.

In Romania and Bulgaria, two countries with somewhat similar experience and traditions in the direction of NQFs, in spite of the progress made, the NQFs are not yet formally recognized by the Council and European Commission, since there is no harmonization of the VET policies and the higher education institutions in respect of drawing up a NQF. However, the process is under way and it is hoped that it will soon be finalized.

According to Zachilas L.(2011: 15) it has been noted that Europe-wide ‘more and more countries use *learning outcomes* for qualifications frameworks, standards, curricula and assessment’, but that in spite of the broad agreement concerning the transparency and accountability provided by the learning outcomes approach, there are, however, some challenges ahead. The challenges have to do with some countries lacking commitment to apply the LO approach or applying it in a non-coherent way and some sectors, particularly general education, are lagging behind’.

The role of the EQF is further made visible in the *recognition* of skills and competences, or rather of learning outcomes, which is a permanent demand of learners, particularly of those working on the European labour market where professionals and skilled workers move or migrate freely. In this respect, the EQF can facilitate recognition by:

- ‘strengthening transparency of qualifications;
- enhancing cooperation and mutual trust;
- establishing a common reference point for qualifications’ (Zachilas L, 2011).

Another step in the achievement of the Lisbon strategy is the ECVET, the European Credit System for Vocational Education and Training (ECVET). Its aim is to ‘give people greater control over their individual learning experiences and make it more attractive to move between different countries and different learning environments’ (*Finland in Focus*, 2011). This project is expected to be launched in 2012, when all qualification will be translated using ECVET. Romania cannot yet be defined as ECVET friendly, since little is known about this form of validation, recognition and accumulation of work-related skills and knowledge in transferable credits. For the Romanian VET system, ECVET remains a challenge which means changes in the overall rules of Romanian VET, proposals for the implementation of ECVET (information and training to training providers and qualification boards), how to define the scope of VET credits etc., real implementation of the system, control and feedback. Since ECVET is an entirely new and challenging trend, first, to set up the proper context for the process is a challenge.

In this section we attempted to look at the trends in European VET and at the achievements of the Romanian VET system. The number of trends previewed reflect a complex and extremely dynamic European education environment, carefully designed,

outlined and monitored by the European Commission through its tools. Romania is part of the EU and conforms to the recommendations made by the EC even if the pace of the implementation of the trends is rather slow.

6. CONCLUSION

The study sought to show the present state and trends in the Romanian VET system. It went out from the preview of the documents of the European Commission on VET which outline the current and future trends in European education: The Barcelona Declaration 2002, the Copenhagen Declaration 2002, the Helsinki Communiqué 2006, The Lisbon Integrated Guidelines for Growth and Jobs 2005-2008, and finally, on the Common Quality Assurance Framework (CQAF), on ECVET, on adult education and continuous education.

The study first outlined the system with its components, the laws, institutions, providers and the links between them. The study approached some major aspects of the EC VET policy and showed the position held by the Romanian VET. The aspects surveyed and the conclusions were:

- the Romanian VET system is aligned to the European policies in many respects, but it lacks flexibility concerning the vertical and horizontal movement of learners between levels of education;

- VET is not an attractive option for youngsters and the traditional career routes still attract most of the high school leavers. The Romanian VET system does not attract a substantial mass of youngsters as compared to other European countries;

- in order to respond to the challenges of the economic environment and the labour market vocational education must permanently adopt innovative training methods, forms of evaluation etc;

- teacher training should become a priority, since trainers are both professionals and stakeholders;

- quality in VET and quality assurance are key aspects in VET which must be diligently pursued;

- the NQF (National Qualification Framework) is under way, but the Romanian trainers and training providers know little about it;

- outcomes-oriented learning is also a key concept used in all educational policy documents and the Romanian VET is aligned with this principle, since the NQF operates as the National Qualification Standards, but, again, little is known about the experiences and achievements thereof;

- ECVET (European Credit System for VET) has become part of the educational policy but, although, ECVET becomes a reality in many countries, in Romania no education authority promotes and implements the EC tool.

In conclusion, Romania has progressed a lot in the direction of the Copenhagen strategies and the Lisbon guidelines. Although the system was in line with other European systems since the 1990s, the government has reformed the entire system along with its components: institutions, the Law of Education, providers and the relationships between them. It has encouraged the development of a rigorous VET system by supporting the providers and their accreditation. It has steered education in the direction of observing the National Qualifications Framework or standards and developing such forms of

education as: adult education, continuing education, second chance education, etc. Romania participates actively in European VET projects under the framework of the Leonardo da Vinci programme through which an impressive number of trainers, learners and leaders have been trained annually. In spite of these efforts, the Romanian VET still has to continue and accelerate the pace of its reform, involve more actors, stakeholders and institutions and make all policies, tools and paths more visible to the users.

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THE ATTRACTION AREA OF THE UNIVERSITY OF ARTS OF TÂRGU MUREŞ

PÉTER KATONA¹, ZOLTÁN BUJDOSÓ²

ABSTRACT. – **The Attraction Area of the University of Arts of Târgu Mureş.** The fundament of the knowledge-based society is the culture of permanent learning/life long learning, which was mentioned as a goal by the signers of Bologna Declaration (1999). The development of education must be one of the fundamental segments of regional development, in the sense that it must look for solutions for the moderation of regional inequalities. The current educational policies cannot ignore these recommendations that are based on results of scientific research. The aim of this study is to dynamically analyse the attraction area of the University of Arts of Târgu Mureş between 1990 and 2013. It focuses on fundamental social and economical processes, going beyond analyzing the space-time dimension of higher education.

Keywords: *attraction area; attraction intensity coefficients; number of students; training programs.*

1. INTRODUCTION

In the second half of the 20th century and on the dawn of the 21st century the importance of human resources has grown next to that of raw material, work power and financial power and a new, knowledge-based social order has emerged. This newly emerging society is described by Machlup as knowledge society (Berenyi, 2003). Knowledge, information has become a fundamental economic factor and has led to social-regional differences which are seen mainly in economy. Through this process the processing and distribution of information and knowledge has favoured the growth and evolution of informational centers, further isolating the periphery. Knowledge-centres can be identified as institutions of higher education, since knowledge has always been connected to people and institutions. According to Berenyi (Berenyi, 2003) new information always emerges from a particular region and political, economical and religious centers have always coincided with knowledge centers. This observation is still valid today, since especially in the countries of the old communist block we are witnesses of the fact that the state executes its power through the control of knowledge and information, which translates in the control of the system of institutions of knowledge centers. Naturally this process of control is running under different social-economical

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circumstances since the falling of the communist regim. This kind of connection between the state and the institutions of higher education which constitute the peak of the educational system cannot be questioned as long as the financing of the educational system is the responsibility of the state and as long as it is aiming high quality education. The state has always aimed to control knowledge centers, but today in many cases the authonomy tendencies of the institutions of higher education go against the state's attempts to enforce its interests. In order to moderate regional differences the state can intervene on a regional level through multi-level strategies. One of these strategies is development of education.

The attraction areas are different types of functional areas which are determined by the function-related behaviour of social groups, thus they are the result of social interactions. In this case the interpretation of space can be understood in a relational and subject-centered and not in an absolute-substantial manner (Benedek, 2000). This type of region is the result of a positive-scientific regionalization and is determined by functional contacts that characterize the center and it's attraction area. These connections can be identified in relation to basic social functions. The number of attraction areas coincides with the number of central functions (Bodor-Pénzes, 2012).

The present study aims to analyse the contacts generated by the educational function, focusing on the higher education segment. According to Benedek (Benedek, 2000), functional regions are methodological formations, the characteristics, content and extention of which are determined by the statistical units and methods used in delimiting regions, but the empirical examination of these regions from it's inhabitants' point of view is also imperative.

2. EXPANSION OF HIGHER EDUCATION IN ROMANIA

Quantitative expansion of higher education in the former communist countries, including Romania, unfolds in the years following the fall of the communist regim. The number of students in higher educational system reaches it's highest level in 2007-2008 (907353 students, according to NSI³).

The rise in the number of students in higher education can be correlated with the demografic potential, changes in the labour market conditions, changes in individual and social expectations toward the quality of higher education. Higher education, a general tendency in the more developed countries, has become more and more important in Romania also, similar to the growing importance of highschool education in the 1990's. This is due to the effect of many factors (labour market conditions, social demands).

On national level there has been a significant decline in the number of higher education students after 2007-2008, a tendency not seen locally. The decline of the number of higher education students can be attributed to educational policy factors (the gradual dissapareance of evening courses), demographic and economical factors (the decline of number of students attending private universities).

³ *National Statistics Institute*

THE ATTRACTION AREA OF THE UNIVERSITY OF ARTS OF TÂRGU MUREȘ

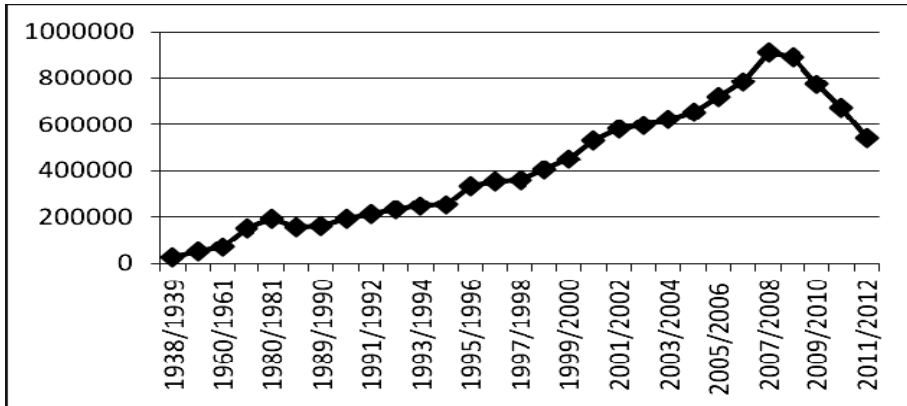


Fig. 1. Changes in the number of students in Romania for the period 1938 to 2012.
Source: NSI, edited by the authors.

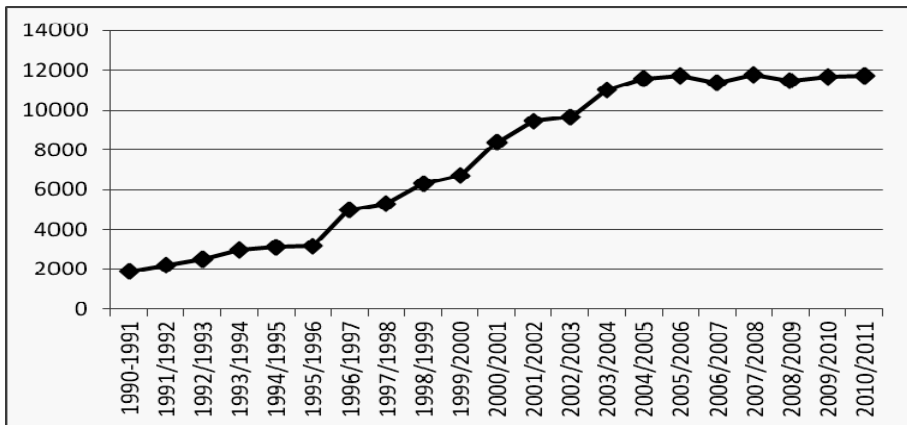


Fig. 2. Changes in the number of students in Târgu Mureș for the period 1990 to 2011.
Source: NSI, edited by the authors.

Private higher education institutes are present on local level. The Dimitrie Cantemir University was accredited in 2005. The city's oldest higher education institutions are the University of Medicine and Pharmacy (1945) and the University of Arts (1946). The first is the most important institution forming medical professionals in Transilvania, the second is a starter for later internationally known artists. The Petru Maior University of Târgu Mureș was founded in 1960 under the name of Institute of Pedagogy and has been reorganized several times. The Hungarian Sapientia University of Transilvania was founded in 2001, is financed by the Hungarian State and is run by a foundation. The Technical and Human Science Faculty in Târgu Mureș offers the possibility for specialists to be formed in Hungarian language. The Teacher and Organist Training College was founded in 1990 and the Reformed Assistant Training College was founded in 1992.

3. UNIVERSITY OF ARTS – TÂRGU MUREŞ

Founded in 1946 in Cluj-Napoca, the Conservatory of Music and Dramatic Art is the predecessor of the existing higher education institutions in Târgu Mureş⁴. During the first eight years of its existence the institution has undergone many structural changes. As a result of these changes on the Hungarian branch the Szentgyorgyi Istvan Drama Institution is founded in Târgu Mureş in 1954. Since then the official name of the institution, as well as the educational content has been changed several times. Since 2009 the official name of the institution is the University of Arts - Tîrgu Mureş. As a result of the introduction of the Bologna system, the institution offers 3 level higher education training programs (BSc/MSc/PhD degree) since 2005. In the 2013-2014 academic year the University of Arts of Târgu Mureş offered several accredited training programs, such as theater, puppetry, directing, movement arts, teatrology, designer, audio-visual communication, multimedia, music teacher undergraduate. Master's degree programs are offered in: theater, puppetry, drama, teatrology, majoring in cultural management and directorys. Doctoral training program launched in theater arts.

4. METHODS, RESULTS AND DISCUSSION

The attraction area of this institution has undergone many changes in the last 20 years, which can be analyzed on 5 different time segments. In our research, the place of residence of all enrolled students was taken into account. The attraction intensity of commune is shown on the intensity map. The attraction intensity coefficients were calculated using the following formula:

$$A_i = \frac{S_n \times 1000}{P_c},$$

where: A_i - attraction intensity, S_n - number of students, P_c - population of commune.

Of the students attending the institutions' courses in 1990, only the first year students started their studies after the fall of the communist regime. The other students were admitted before the political changes in 1989, in accordance with the directive plan instructions specific to the communist regime. The number of students admitted to the institution was limited, as shown on the map. Of the 54 students admitted only one student was resident of a rural area, the rest of the students were residents of cities, especially cities which a strong cultural background. No students from foreign countries applied in this period of time.

In the 1998-1999 academic year students were no longer limited in their choices, their number tripled, and 10 students came from Ukraine. The number of students with rural origins is still low (13), the dominance of students coming from cities goes on. The Hungarian faculty presents a strong attraction in parts of the country predominantly populated by Hungarians. Since 1995 the institution offers courses in teatrology, a new domain.

⁴ http://www.uat.ro/fileadmin/user_upload/pdf/CARTA_UARTE_TG_MURESnov.pdf

THE ATTRACTION AREA OF THE UNIVERSITY OF ARTS OF TÂRGU MUREȘ

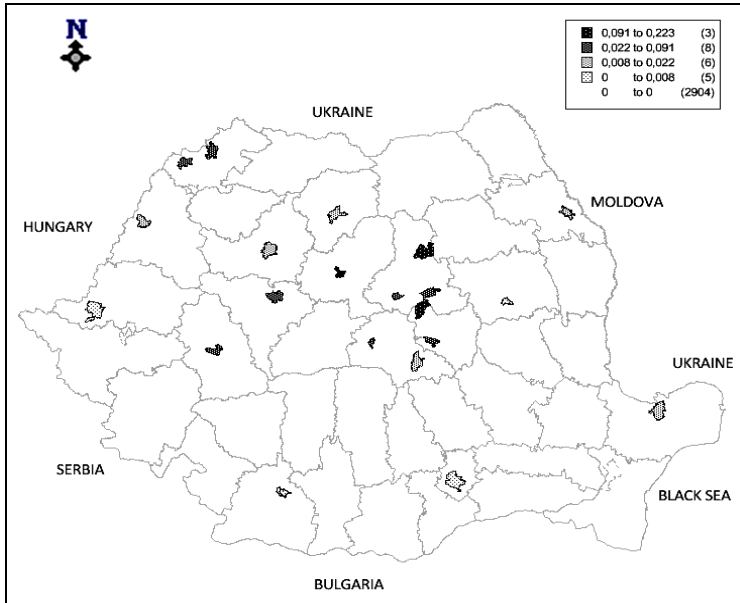


Fig. 3. The Attraction Area of University of Arts-Târgu Mureș (1990-1991 academic year).
Source: institutional data, edited by the authors.

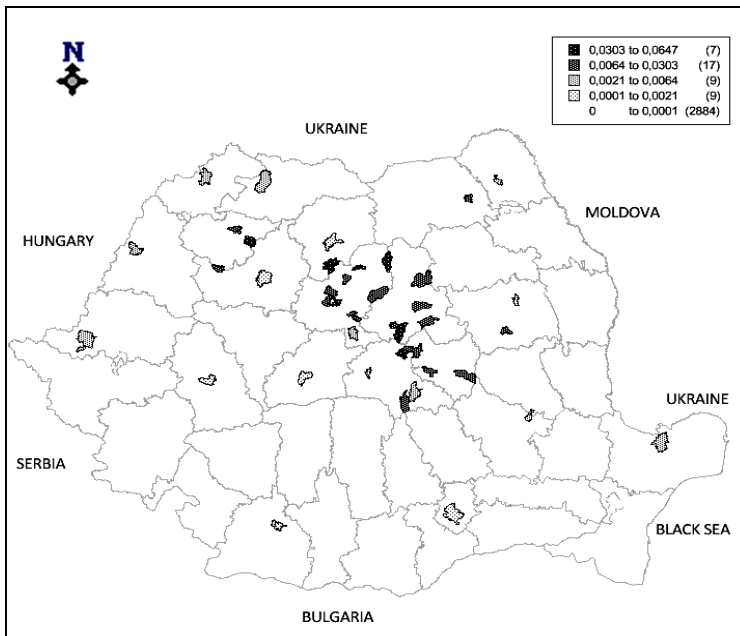


Fig. 4. The Attraction Area of University of Arts-Târgu Mureș (1998-1999 academic year).
Source: institutional data, edited by the authors.

The situation is similar in the 2002-2003 academic year, when of the 154 students admitted, 12 students were residents of rural areas and 2 students came from abroad (Hungary). Starting with 2001 a new course, puppetry is added to the institution's training program.

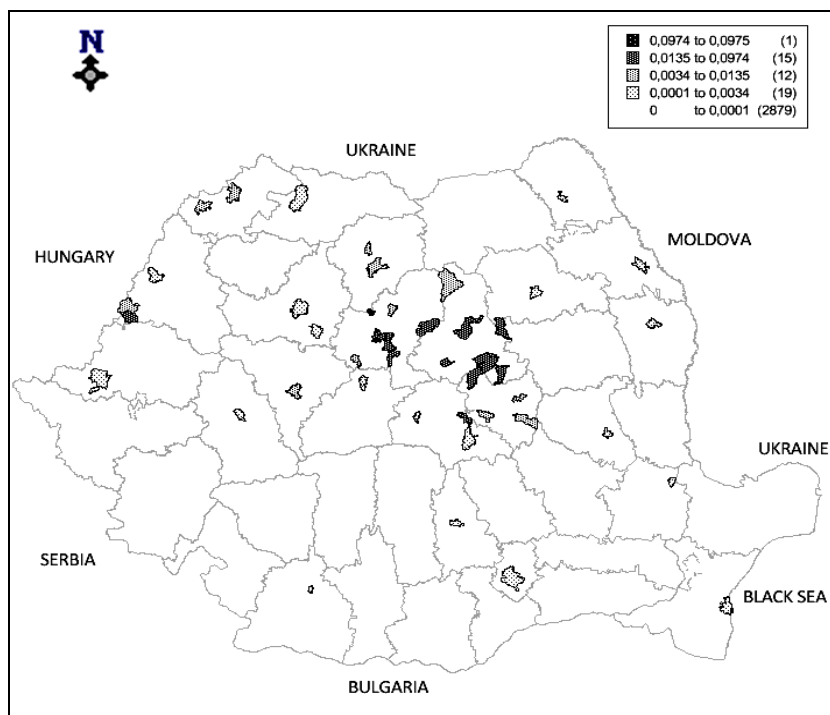


Fig. 5. The Attraction Area of University of Arts-Târgu Mureș (2002-2003 academic year).
Source: institutional data, edited by the authors.

The number of students doubled in the 2007-2008 academic year due to expansion, rising to 305. Ten students came from abroad (Hungary, Moldova and Ukraine). These changes were the result of institutional differentiation (two faculties starting with 2005: music and theater pedagogy), diversity of educational programs (music pedagogy starting with 2004).

According to official data the number of students decreased in the 2012-2013 academic year. 5 students of a total of 195 are from abroad (Hungary, Scotland).

There is a compact area forming around Târgu Mureș, which is already seen on the 2008 map. These special changes can be attributed to the introduction of music pedagogy courses in the training program. The dominance of students with urban residence is ongoing. Starting with 2011 there are two arts faculties offering courses within the university (in Romanian and Hungarian language), teaching theater arts, music arts, visual arts and communication to students wishing to continue their studies.

THE ATTRACTION AREA OF THE UNIVERSITY OF ARTS OF TÂRGU MUREȘ

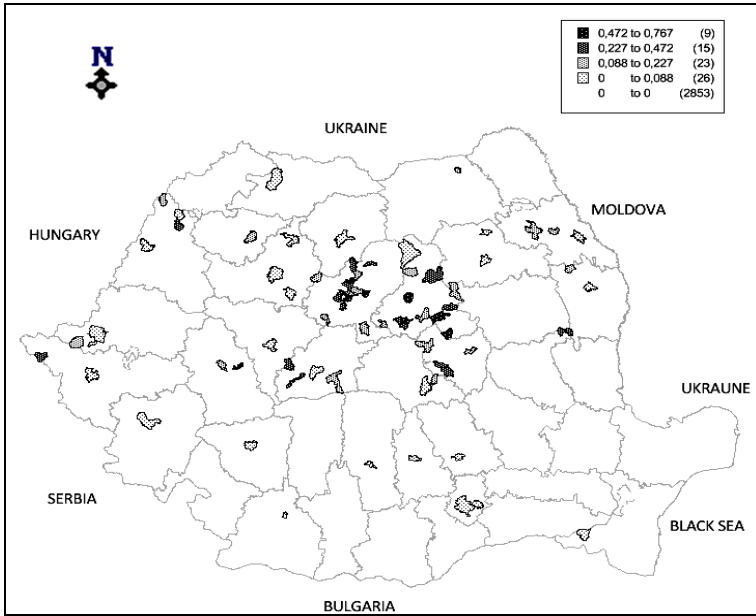


Fig. 6. The Attraction Area of University of Arts – Târgu Mureș (2007-2008 academic year).
Source: institutional data, edited by the authors.

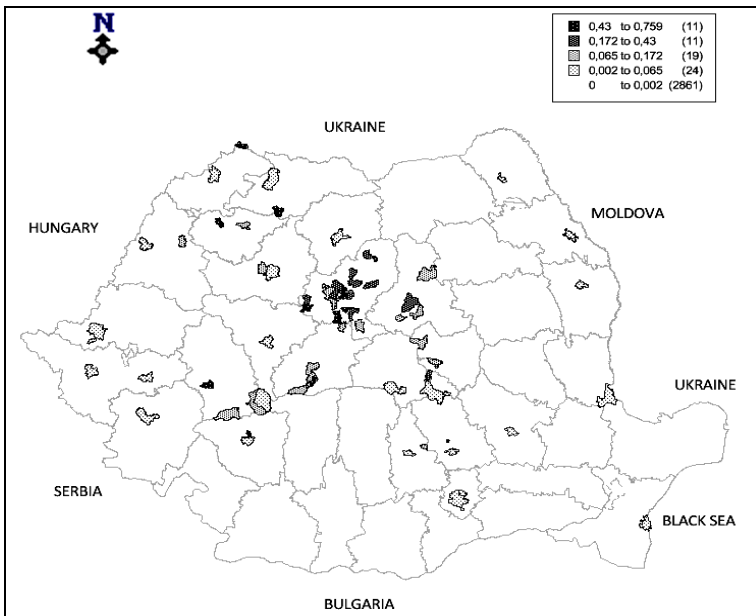


Fig. 7. The Attraction Area of University of Arts-Târgu Mureș (2012-2013 academic year).
Source: institutional data, edited by the authors.

4. CONCLUSIONS

The University of Arts - Târgu Mures has gone through significant changes during the past 20 years, a process similar to that of the institutions of higher education in other countries in the former communist block. This model of development is a transition from the planning system model to the European modern university model.

The institutional differentiation and the growing diversity of educational programs led to significant increase in the number of students, following the national trend in the expansion of higher education.

Students applying to this institution mainly come from cities, especially cities with a strong cultural background. The significant increase in the number of Hungarian students can be attributed to bilingual education system.

In the near future the number of students could be maintained or even increased by launching of new training programs and infrastructural development.

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NOTES AND BOOK REVIEWS

CORRESPONDENȚA LUI NICOLAE DRAGOMIR CU MAGISTRUL SĂU GEORGE VÂLSAN ȘI CU CONSTANTIN BRĂTESCU (INEDITĂ)

AL. PĂCURAR¹

ABSTRACT. – **The Correspondence of Nicolae Dragomir with his Master George Vâlsan and with Constantin Brătescu (Unpublished).** This article, a short excerpt from a book, which is now in process of being published – refers to the correspondence between professor Nicolae Dragomir, who dedicated himself to the study of the profession of sheep breeding of the Mărgineni people (inhabitants from around the city of Sibiu), with his mentor, scientist George Vâlsan, „the spiritual patron” of the Cluj school of geography, as well as professor Constantin Brătescu, director of the Institute of Geography from the University of Cernăuți and editor of the “*Analele Dobrogei*” Journal. For the very first time in geographic literature, representative fragments of this correspondence are analyzed. The emphasis is placed on the advices given by the master to his scholar, so that he may achieve the monography of his birthplace, as well as on the description the master is able to accomplish.

Keywords: *correspondence, the figure of the geographer George Vâlsan, national awareness and geography, Mărginean sheep breeder, the monography of Săliște, Southern Dobruja (Cadrilater).*

1. INTRODUCERE

În arhiva familiei Dragomir s-au păstrat scrisori din corespondența profesorului, unele cu membrii familiei, altele cu consăteni sau cu foști elevi de-ai săi.

Pentru geografi este de interes major corespondența purtată cu doi mari oameni de știință ai perioadei interbelice, George Vâlsan și Constantin Brătescu. De departe cele cinci scrisori trimise lui Dragomir de către mentorul său, savantul George Vâlsan, sunt cele mai impresionante, din care două, îndrăznesc să afirm, că sunt unice în peisajul epistolar geografic românesc, după cum vom vedea. Interesant ar fi să cunoaștem și conținutul scrisorilor pe care Dragomir le-a trimis mentorului său. Se păstrează doar una, pe care profesorul clujean nu a mai trimis-o, cel mai probabil conștientizând îndrăzneala pe care și-a luat-o „*admonestându-și*” mentorul că nu-și cruță eforturile prea mari care nu-i „*dau răgaz nici de odihnă*”!

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2. SAVANTUL GEORGE VÂLSAN LA CLUJ

Despre savantul George Vâlsan, „de la care au rămas contribuții științifice, unele de strictă specialitate și altele de deschidere de zare asupra geografiei și a vieții”, Emanoil Bucuța (1942, *op.cit.*) spunea: „catedra i-a fost dragă, atât pentru că îi mulțumea setea de cercetare, cât mai ales pentru că-l ținea în legătură cu studenții și-i dădea prilejul să le fie o călăuză și un prieten”, el care, după accidentul feroviar suferit la Ciurea, de lângă Iași, „a fost toată vremea suferind și zâmbetul de pe fața lui de fildeș acoperea greu această suferință” (Emanoil Bucuța, *op.cit.*, p.4).

Personalitatea savantului George Vâlsan a fost de largă cuprindere, având o puternică tentă formatoare de conștiințe naționale vii, căci „profesorul de carte se făcea deseori un profesor de viață”. Poate tocmai de aceea, între magistrul dispus să ofere și astfel de lecții, și învățăcelul Dragomir, „cursist” care își completa studiile la nou înființata universitate românească a Daciei Superioare, și care cunoscuse câteva experiențe majore, precum înființarea școlii românești de la Hunedoara, se stabilește o legătură spirituală mai strânsă.

După studii la București, unde a fost discipolul lui Simion Mehedinți, apoi la Berlin (1911-1912) și Paris (1913-1914), George Vâlsan realizează cel mai amplu studiu de geografie fizică asupra Câmpiei Române, rămas neegalat până astăzi, și publică alte peste 100 titluri științifice. Pentru întreaga sa activitate științifică, a fost ales în 1920 membru al Academiei Române, după ce în 1919 fusese chemat să pună bazele învățământului geografic românesc la Universitatea Daciei Superioare de la Cluj.

Contextul politic intern, axat pe realizarea idealului național de unire a tuturor românilor din provinciile lor geografico-istorice într-un singur stat, la acea vreme un regat constituțional înfloritor, cât și contextul geopolitic internațional, adică începutul mișcărilor revizioniste, l-au determinat pe George Vâlsan să se aplece mai mult asupra laturii formatoare, atât a geografiei, cât și a caracterului elitelor universitare românești, în ceea ce se dorea atunci, anume ca fiecare cetățean să fie o conștiință vie a neamului românesc!.

În spiritul lui Ernest Renan, după care „două lucruri creează o conștiință colectivă: unul e stăpânirea în comun a unei bogate moșteniri de amintiri; celălalt e consimțământul actual, dorința de a trăi împreună, voința de a continua valorificarea moștenirii care a fost primită neîmpărțită”, Vâlsan militează ca și prin geografie, să se făurească conștiința noastră națională, „o forță sufletească în evoluție”, care dă vigoare națiunii!.

Privitor la menirea geografiei în forjarea conștiinței naționale, savantul spune: „Geografia analizând suprafețe, limite, relief, ape, aglomerări etc., dă elemente pentru rezolvarea unor probleme pe care ea nu e obligată să le rezolve [...]. Această rezolvare o face însă cititorul sau cercetătorul pentru fiecare caz particular [...], care își formează o **convingere**. În această privință, geografia are o valoare practică națională mult mai mare de cât se bănuiește. Ea este necesară pentru claritatea conștiinței naționale!” (George Vâlsan, 1921, *op.cit.*, p.22).

La întrebarea retorică „Ce înseamnă a fi Român?”, lansată de Vâlsan la lecția inaugurală a cursului de Geografie la Universitatea din Cluj la 19 noiembrie 1919 (*ibidem*, p.12-13), geografia își găsește alături de celelalte științe identitare – limba și literatura română, istoria, obiceiurile, producțiile culturale etc. – locul său, care reiese din răspuns, pe care tot savantul îl dă: „Înseamnă să mărturisești, prin chiar această numire, originea ta nobilă și mândria de a fi păstrat un astfel de nume. Înseamnă să vorbești această limbă românească, limbă care nu este numai urmașe directă a unei limbi vestite de mare cultură,

ci e și o limbă biruitoare, căci într-o luptă de secole cu dialectele slave și cu alte limbi, le-a învins pe teritoriul său și le-a făcut roabele sale. Înseamnă să locuiești Țara Românească, țară pe care o forțare neîntreruptă de opt sute de ani a izbutit să o rotunjească puțin câte puțin până a adus-o în forma de astăzi – cu munții, cari sunt ai noștri, fiindcă noi le-am dat turmele de oi și doinele – cu dealurile care sunt ale noastre, fiindcă noi le-am împodobit cu grădini și vii și mănăstiri frumoase – cu câmpiile care sunt ale noastre, fiindcă noi le-am lucrat și destelenit an de an, cucerindu-le prin munca noastră și prin numărul nostru, cu Dunărea care e a noastră, fiindcă noi i-am pus salbe de sate pe amândouă malurile și noi i-am cercetat apele și ostroavele, - cu tărâmul Mării, care e al nostru, fiindcă noi l-am deșteptat la viața pe care nu a mai trăit-o din antichitate. A fi Român înseamnă a fi suferit sute de ani și a se fi bucurat câteva clipe, - a fi plâns atât, încât și cântecele să pară că plâng, - a fi văzut neîncetat distruse începuturile de cultură mai înaltă și totuși a le fi început din nou, - a fi fost jefuit fără milă și de toți sălbatecii și cu toate acestea, în vremuri de liniște a fi dăruit prisos de hrană materială și sufletească vecinilor și chiar popoarelor mai depărtate, - a fi fost întotdeauna izbit în clipele sfinte ale încercărilor de unire națională, și cu toate acestea a fi ocrotit totdeauna începuturile de acest fel ale popoarelor din jur, - a fi fost darnici în sărăcie și mărinosi la izbândă. A fi Român înseamnă a fi păstrat tenacitatea neamului nostru, acea vitalitate misterioasă și nesecată, care s-a putut îndoi, dar niciodată nu s-a frânt, curpen mlădios și tare acoperind în veșmântul său cu flori modeste și parfumate pădurea întregă. Și mai ales a fi Român înseamnă a avea credința că toate aceste însușiri bune ale neamului nostru, pe care le putem arăta cu cinste oricui, nu au avut încă răgazul să se desfășoare în deplinătatea lor, dar că, în numele lor, avem dreptul să cerem libertatea de a le duce la desăvârșire, nu numai pentru gloria noastră, ci și pentru binele lumii întregi”.

Iată concepția savantului vizionar George Vâlsan, care, alături de elitele României monarhice interbelice, s-a străduit să împlinească **datoria vremii lor**, care era în același timp conștient că datorită evoluției implicabile a societății omenești în ansamblul ei, „*generația viitoare și cele următoare vor avea poate reticențe*” în privința ideilor emise. În prezent, lumea mileniului III, cunoaște o evoluție aparte în această eră a globalizării, când mai mult ca oricând, este imperios necesară păstrarea identității și aportul propriu la concertul națiunilor civilizate. Savantul – vizionar încheie lecția inaugurală cu un îndemn de o copleșitoare perenitate: „*datoria generațiilor ce vor veni după noi va fi să îndrepte ce se va dovedi greșit în munca noastră. Dar înainte de a judeca cei viitori Pe care nu-i cunoaștem și totuși îi iubim, să-și aducă aminte și cât am suferit noi în sângele și în sufletul neamului nostru, și la ce întâmplări mari am fost părtași. Să se gândească și la faptul că adevărurile vremii lor vor înflori pe pământul fecundat prin gândul și simțirea noastră. Și poate atunci câțiva ne vor înțelege și ne vor iubi*”. Iată și pe omul George Vâlsan, care dublează savantul și care, mai ales în ultimul său deceniu de viață, nu ezită să dea „*sfaturi pentru studenți*”.

3. CORESPONDENȚA CU GEORGE VÂLSAN

Am încercat să creionez în câteva rânduri pe mentorul lui Nicolae Dragomir care, începând din vara anului 1919, în calitate de “audient-cursist” își completează studiile pentru a deveni profesor, moment în care este remarcat – avem să arătăm mai jos – de profesorul și totodată directorul Institutului de Geografie a Universității Daciei Superioare, George Vâlsan.

După absolvirea acestor studii și numirea lui în 1923 ca profesor la Liceul „Decebal” din Deva, la 14 noiembrie 1924 George Vâlsan îi scrie, interesându-se de opțiunea lui „pentru Universitate”, pentru licență. Totodată, îl îndeamnă: „*nu uita de monografia Dtale, căci ar fi păcat*”, apreciind că a adus „*contribuțiuni frumoase*”, observând că „*partea pastorală ar trebui întregită cu toate știrile pe care le-ai mai cules*”, promițându-i publicarea în volumul II al buletinului „*Lucrările Institutului de Geografie al Universității din Cluj*”. Mentorul său îl mai sfătuiește: „*Nu te lăsa descurajat de împrejurările vieții și nu pierde bunul început de muncă personală. Câte puțin, dar fă ceva în direcția aceasta*”.

În scrisoarea din 28 iulie 1925, magistrul îl anunță să-și revizuiască pe alocuri materialul pentru publicația „*Astra*” care se publica în toamnă, îndemnându-l să profite de vacanță pentru odihnă, așa cum el însuși intenționează să petreacă o lună la Mare, la sanatoriul CTC, de pe țărmul Mării Negre. La 24 noiembrie 1926, George Vâlsan își felicită învățăcelul pentru premiul „*Emmanuel de Martonne*” pe care l-a obținut cu articolul „*Oierii Mărgineni*”, publicat în volumul al II-lea al „*Lucrărilor Institutului de Geografie*” de la Cluj, îndemnându-l „*de a continua și mai departe pe aceeași cale a muncii curate și dezinteresate*”, constatând cu satisfacția magistrului care-și vede învățăcelul reușind: „*Iată-te un om celebru! Încoronat cu un premiu pe care nu-l poate obține oricine, cu lucrarea frumos tipărită...*”. Totodată, în privința extraselor, îl sfătuiește: „*unul vei opri pentru biblioteca Institutului, iar unul te rog să nu uiți a-l trimite dlui G.T. Kirileanu, Bibliotecarul M.S. Regelui, la Palatul Regal, București. Dar neapărat să-l trimiți!*”. Iată, avem aici și exemplul unui comportament civic de înaltă ținută, în societatea atât de așezată a României monarhice. Se cuvine să amintim aici că Regele Ferdinand I cel Leal sau Întregitorul, cel căruia Vâlsan îi recomanda lui Dragomir să-i trimită extrasul studiului său, n-a pregetat – cu ce zbulcium personal și familial! – să împlinească visul unirii tuturor românilor! (fig. 1).



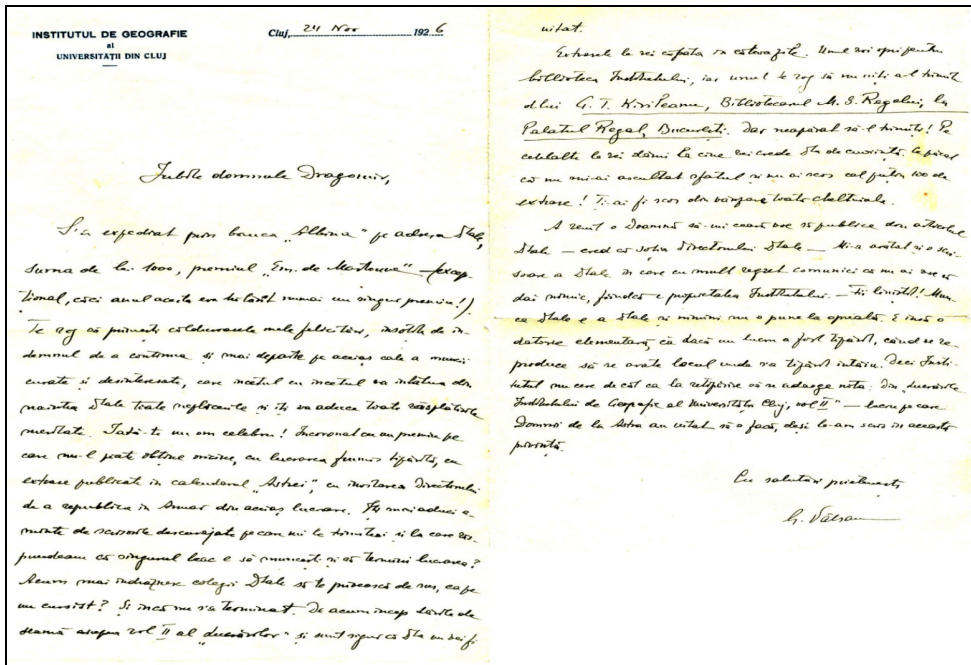


Fig. 1. Scrisoarea adresată de George Vâlsan lui Nicolae Dragomir (24 noiembrie 1926).

Magistrul îl previne pe Dragomir: „Și încă nu s-a terminat. De acum încep dările de seamă asupra volumului II [...] și sunt sigur că Dta nu vei fi uitat”. Așa a și fost, ecourile publicării studiului său au fost numeroase. Se remarcă cele din Statele Unite ale Americii, unde studiul său este citat într-o sinteză a presei geografice – „The Geographical Review” – a Societății Americane de Geografie – American Geographical Society. Acolo, în recenzie care i se face, printre altele, se scrie: „This colorful shepherd life with its characteristic and highly developed practice of transhumance is on the decline throughout the southern Carpathian region. A variety of circumstances has brought this about, primarily: the occupation of the Wallachian plain by an agricultural population, an economic war between Austria-Hungary and Rumania (1886-1900), and the closing for a time of the Carpathian frontier. At present most of the «old shepherds of Săliște, forced to sell their great flocks, have taken up itinerant or fixed trading, have established themselves in the towns of Wallachia, have bought or sold land in Dobruja, and have become artisans despite their former abhorrence of this occupation» („Această viață plină de culoare a păstoritului împreună cu caracteristica sa și cu răspândita practică a transhumației se află în declin în întreaga regiune a Carpaților sudici. O diversitate de circumstanțe a condus la această stare de lucruri, printre care, în principal: ocuparea câmpiei Valahiei de o populație ocupată în agricultură; un război economic între Austro-Ungaria și România (1886-1900), și închiderea pentru o scurtă perioadă de timp a graniței carpatice. În prezent, majoritatea păstorilor din Săliște, obligată să-și vândă turmele uriașe, au început să se ocupe cu comerțul itinerant sau stabil în orașele din Valahia, au cumpărat sau au vândut pământ în Dobrogea, au devenit meșteșugari, în ciuda aversiunii lor din trecut față de această ocupație”).

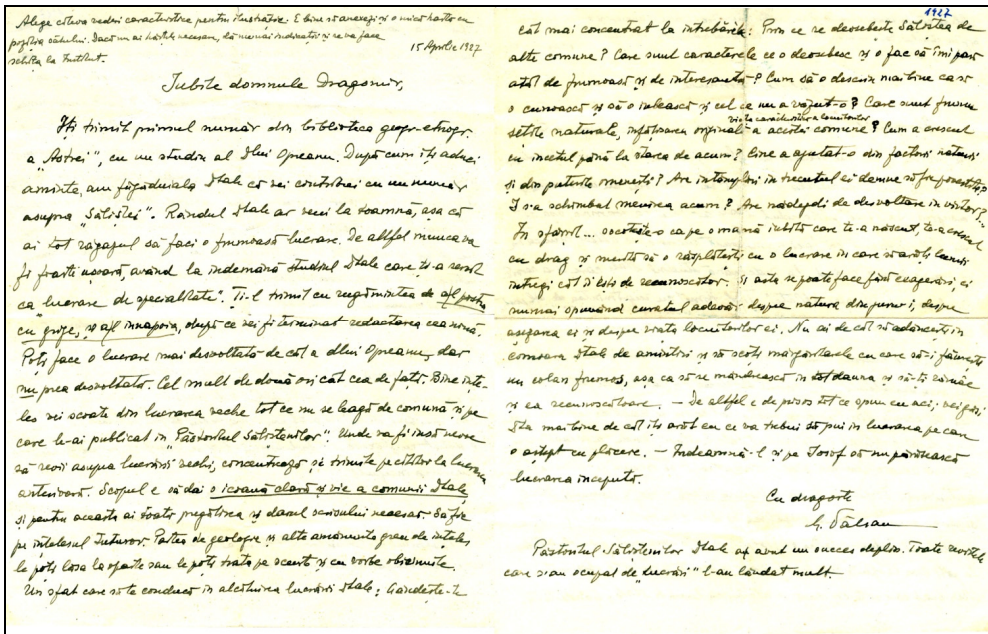


Fig. 2. Scrisoare adresată de savantul George Vâlsan profesorului Nicolae Dragomir (15 aprilie 1927).

În scrisoarea din 15 aprilie 1927, după o scurtă introducere, savantul îl anunță pe Dragomir să pregătească o lucrare „*asupra Săliștei, dar nu prea dezvoltată*”, programată să apară în toamna aceluiași an în „*Biblioteca Astra*”. Urmează câteva sfaturi – pe care noi le considerăm memorabile – pe care savantul i le dă, cu scopul „*să dai o iconă clară și vie a comunei Dtale, și pentru aceasta ai toată pregătirea și darul scrisului necesare*” (fig.2).

Iată sfaturile magistrului: „*pentru ca lucrarea să fie pe înțelesul tuturor*”, anume ca „*partea de geologie și alte amănunte greu de înțeles, le poți lăsa la o parte sau le poți trata pe scurt și cu vorbe obicinuite[...]*. Gândește-te cât mai concentrat la întrebările: Prin ce se deosebesc Săliștea de alte comune? Care sunt caracterile ce o deosebesc și o fac să-ți pară atât de frumoasă și de interesantă? Cum să o descriu mai bine ca să o cunoașci și să o iubească și cel ce nu a văzut-o? Care sunt frumusețile naturale, înfățișarea originală a acestei comune, viața caracteristică a locuitorilor? Cum a crescut cu încetul până la starea de acum? Cine a ajutat-o din factorii naturali și din puterile omenești? Are întâmplări în trecutul ei demne să fie povestite? S-a schimbat menirea acum? Are nădejdi de dezvoltare în viitor? ... În sfârșit... socotește-o ca pe o mamă iubită care te-a născut, te-a crescut cu drag și merită să o răsplătești cu o lucrare în care să arăți lumii întregi cât îi ești de recunoscător. Și asta se poate face fără exagerări, ci numai spunând curatul adevăr despre natura din juru-i, despre așezarea ei și despre viața locuitorilor ei”.

La sfârșitul scrisorii, Vâlsan îi scrie cu bucurie că „*păstoritul Săliștenilor Dtale a avut un succes deplin. Toate revistele care s-au ocupat de «Lucrări» l-au lăudat mult*”.

Urmează o pauză de câțiva ani în corespondența dintre George Vâlsan și Nicolae Dragomir, până în 1934. Perioada a corespuns revenirii savantului la București, în 1929-1930, și a acutizării bolii sale de piept în urma zdrobirii toracelui, survenit în accidental

feroviar de la Ciurea-Iași din 1924. În același timp, Nicolae Dragomir s-a transferat la Școala Normală din Cluj și apoi la Liceul Barițiu din același oraș, unde în paralel cu activitatea didactică, el va continua seria anchetelor sale printre oierii mărgineni, pregătind un vast studiu despre cum au ajuns ei în Basarabia, Crimeia, Caucaz, avatururile lor de acolo, până în America de Nord, în Statele Unite.

Într-o scrisoare – credem noi, o copie – pe care Dragomir a expediat-o magistrului său la 10 aprilie 1934, acesta îi cere părerea despre studiul său asupra peregrinărilor oierilor mărgineni, ca unuia care „poartă o deosebită grijă chestiunilor românești”. Ne reține atenția în această epistolă tonul temător al lui Dragomir, ce reiese din afirmația: „vă trimit – mărturisesc, în mod clandestin, căci cunoașteți împrejurările de pe la noi – această lucrare, cu rugarea să binevoiți a o răsfoi cât de fugitiv și a Vă da părerea, dacă merită să fie îndreptată și dată publicității” (fig. 3). Să reamintim cititorilor că este vorba de calvarul oierilor mărgineni pe care revoluția bolșevică i-a prins acolo, ei nemaiputându-se întoarce acasă, și care, în procesul comunizării Rusiei, cu precădere în cursul anilor 1929-1935, au fost deposedați în modul cel mai abuziv, chiar barbar, de întreaga lor agoniseală, au fost închiși, batjocoriți și chiar uciși. Din moment ce studiul a văzut lumina tiparului în volumul al VI-lea al „Lucrărilor Institutului de Geografie al Universității din Cluj”, magistrul și-a dat acordul, ba mai mult, după moartea sa, survenită în august 1935, lucrarea primește în anul 1941 premiul Academiei Române la secțiunea geografie.

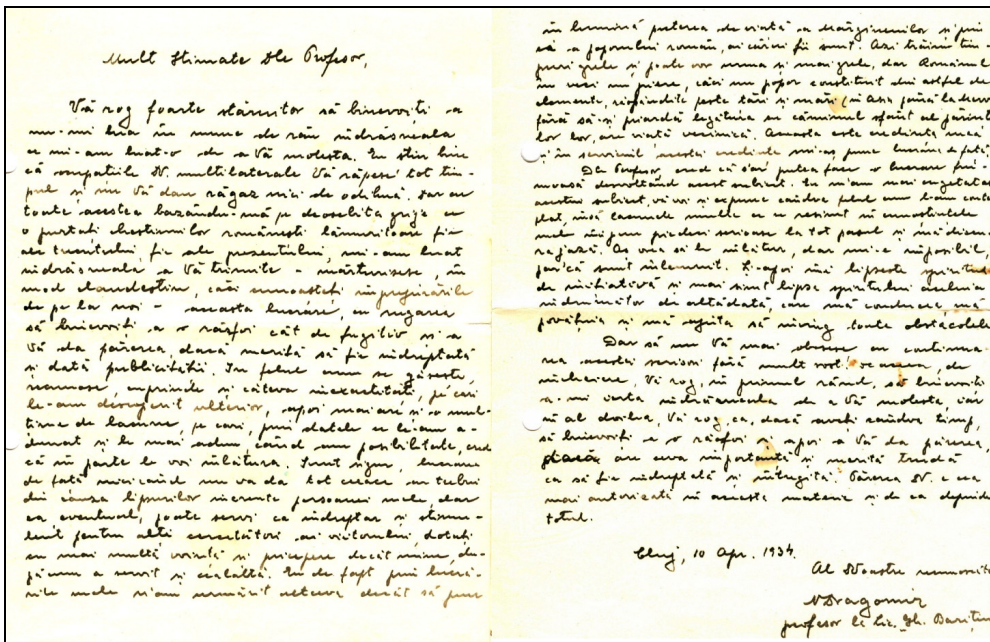


Fig. 3. Scrisoare adresată de Nicolae Dragomir mentorului său, profesorul George Vâlsan (10 aprilie 1934).

Chiar de la apariția sa, studiul a fost remarcat de profesorul Ion Simionescu, care, la 10 februarie 1938 în ziarul „Timpul”, sub titlul „Wikingii români” îi face o elogioasă recenzie, comparându-i pe oierii mărgineni cu „wikingii din veacul al optelea care au rămas

vestiți ca energie omenească”, care au ajuns înaintea lui Columb în America, precum oierii mărgineni „în călătoria lor pentru câștigul pâinei zilnice e o întreagă epopee, în care elementele naturii sunt totuși învinse prin eroism și voință [...]. Icoana energiei noastre, în care mai putem pune oarecare speranțe de îndreptare mi-a fost evocată de lucrarea dlui N.Dragomir. Autorul limitează sfera Mărginenilor la vreo 13 comune din jurul Săliștei, între care se numără și locuitorii din Jina și Poiana rămași încă oierii de odinioară și ca ocupațiune și ca port”.

În vara anului 1935, George Vâlsan se stinge din viață; la 7 februarie 1935 îi expediază lui Nicolae Dragomir ultima scrisoare în care îi apreciază noul studiu, dar nu numai: „Lucrarea Dtale e tot așa de bună ca și cea dintâi. În privința aceasta poți fi fără grije. Ești singurul dintre Ardelenii care au lucrat cu mine și care știe nu numai să muncească răbdător, dar și să aibă un plan foarte clar și o expunere frumoasă. Sunt convins că orice vei mai lucra, va fi bine”. După ce își exprimă bucuria la aflarea intenției lui Dragomir de a studia întreg oieritul Mărginenilor, „acest cuiabar de păstorie” față de care „numai Săcelenii Brașovului au calități asemănătoare”, și după câteva întrebări care să-l conducă pe Dragomir a le lămuri, urmează o pagină memorabilă în care magistrul, simțindu-și sfârșitul aproape, se destăinuie. În fapt, este o impresionantă caracterizare a lui Nicolae Dragomir (fig. 4).

Printre altele, magistrul îi scrie: „- Cum poți vorbi de descurajare? Fiecare avem necazuri – uneori mari de tot, – dar puterea gândului bun trebuie să le învingă pe toate. Trebuie să găsești sprijin în trecutul Dtale de viață curată și în opera pe care ai realizat-o până acum și care e remarcabilă. Toți prietenii mei, cărora le-am recomandat să te citească, te prețuiesc. Părintele Bobulescu (care acum adună material pentru un vast studiu asupra satului la Români) te recitește cu încântare. – Dar eu, crezi că te-am uitat și te voi lăsa fără sprijin? Eu te țin minte din primele lecții ale cursurilor de

vară pe care le-am ținut la Cluj. Ședeai cam prin fund, spre fereastră, luai mereu note și mă priveai cu ochi de lumină și de cutremur, ca la descoperirea unei vocații. Și multe din îndrumările mele de atunci le dam numai pentru Dta. Deși nu ți-am spus-o niciodată, ai fost unul din elevii mei cei mai iubiți, fiindcă simțeam cum sămânța cade pe ogor proaspăt și rodește. Era o desfătare să privesc în ochii Dtale. Mă simțeam ca într-o poiană ascunsă între brazi și plină de rouă, pe care n-a scuturat-o încă nici un pas de om. – Văd că supărările au venit, au svântat roua și au cosit iarba cea frumoasă. Așa ne cosește pe toți vremea și vârsta. Dar eu cred că în sufletele bune și dezinteresate, ca al Dtale, rezerva de energie e aproape nesecată. Te crezi doborât dar te vei înălța iarăși. Poiana cea ascunsă va înflori ca și mai înainte spre mulțumirea pușinilor prieteni care o cunosc și o privesc cu drag din depărtare”.

Ce-am mai putea adăuga? Nimic! Mă copleșește puritatea sentimentelor lui Vâlsan, aș vrea ca prin tunelul timpului să mă transpun în acea perioadă fastă a României, când toate energiile creatoare ale oamenilor săi s-au putut manifesta plenar. Mă încercă și un gând înnegurat! Cum s-a putut ca un astfel de profesor ca Nicolae Dragomir, pe care



Fig. 4. Picul ultimei scrisori adresate lui Nicolae Dragomir de mentorul său, George Vâlsan.

unul dintre cei mai mari geografi români l-au caracterizat așa cum am văzut mai sus, să fie marginalizat?, de ce toți membrii Institutului de Geografie al Universității din Cluj, colectiv din care și el a făcut parte, au fost înlăturați – cu o singură excepție, după 1947?. Răspunsul îl intuim, se poate și dovedi, însă intenția noastră este una recuperatorie și nicidecum revanșardă.

4. CORESPONDENȚA CU CONSTANTIN BRĂTESCU

În același plan al corespondenței profesionale, legat de studiul privind transhumanța oierilor mărgineni în Dobrogea de Sud (Cadrilater), se înscrie schimbul epistolar cu profesorul Constantin Brătescu de la Institutul de Geografie al Universității din Cernăuți, directorul revistei Societății Culturale Dobrogene, „*Analele Dobrogei*”. Pentru numărul festiv închinat Cadrilaterului „*după un pătrar de secol 1913-1938 de stăpânire civilizatoare românească*”, profesorul Brătescu cere unui număr de douăzecișiopt de specialiști din varii domenii ale științelor de la cele patru universități românești, printre ei numărându-se și Nicolae Dragomir, articole referitoare la această parte de țară. Corespondența cu acesta se referă tocmai la publicarea studiului său asupra transhumanței oierilor mărgineni în Cadrilater.

Într-un final fericit, Dragomir își vede publicat studiul alături de alte pagini ale unor savanți și tineri cercetători precum Radu Vulpe, Nicolae Bănescu, Dimitrie Onciul, Alexandru P. Arbore, Ioan Nistor, A.N. Pineta, Dumitru Stoicescu, Dan Iliescu, Simion Mehedinți și, desigur, Constantin Brătescu. Ce se va fi întâmplat după 1947 cu toți aceștia, care au lucrat cu sârg pentru țara lor?. Mă voi opri doar la cel considerat cel mai mare geograf român, Simion Mehedinți, ridicat prin merite proprii din rândul țăranilor răzeși vrânceni de la Soveja la cele mai înalte demnități, în a cărui casă ființează în prezent Institutul de Geografie al Academiei Române. Am să redau o secvență din viața sa de după 1947,

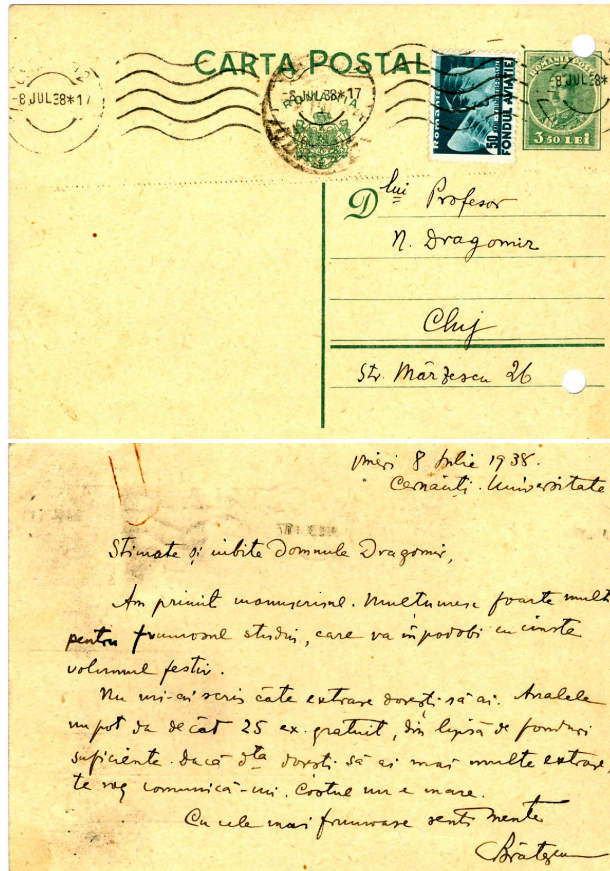


Fig. 5. Carte poștală (recto,verso) expedită lui Nicolae Dragomir de editorul Constantin Brătescu.

apelând la amintirile chirurgului Ion Juvara (1996, *op. cit.*, p. 244): „Pe profesorul Simion Mehedinți l-am operat pentru un cancer sigmoidian. Împlinise 82 de ani, dar avea o stare biologică perfect normală. Atât înainte, cât și după operație, lucra zilnic 4-6 ore. Fusesse evacuat din casa sa, nu avea pensie și o ducea destul de greu, dar suporta totul cu demnitate; nu l-am auzit niciodată plângându-se de situația în care se găsea. Într-o zi a venit în clinică profesorul Constantin I. Parhon, să o viziteze pe una din colaboratoarele lui care fusesse operată. l-am spus că Simion Mehedinți este internat și operat. A intrat să-l vadă. Erau vechi prieteni. l-a întrebat dacă are pensie. A răspuns că nu. «Bine, am să intervin să-ți dea pensie», a spus profesorul Parhon. «Nu primesc decât dacă se va da tuturor colegilor mei!», a răspuns Simion Mehedinți, spre uimirea mea care știam cât de greu trăia. Oricine citește acest episod își poate da seama ce om era profesorul Mehedinți. Am de la el un tablou de Tonitza, dar mai valoroasă e scrisoarea de mulțumire în care face considerente asupra comportării oamenilor în vremea pe care o trăim, precum și asupra calităților deosebite ale poporului român care a trecut prin atâtea epoci istorice vitrege”. Aceasta era calitatea umană la marea majoritate a intelectualilor formați în România monarhică...

Revenind la corespondența profesorului Brătescu cu Nicolae Dragomir, acesta îi cere să evidențieze în studiul său că „teritoriul Cadrilaterului intră în zona de expansiune a elementului românesc”, probată atât de perfect prin fenomenul transhumanței oierilor mărgineni, chestiune în care „Dta ai cuvântul hotărâtor”, urându-i la final „succes frumos la lucru!”. Meticulos, având o educație germană, profesorul Brătescu revine la 15 mai 1938 cu întrebarea când ar putea să-i trimită articolul, căci „e timpul să pun volumul sub presă”.

În ultima carte poștală expedită de profesorul Brătescu lui Nicolae Dragomir, la 8 iulie 1938 (fig. 5), acesta îi mulțumește pentru studiul care „va împodobi cu cinste volumul festiv”, încheind „cu cele mai frumoase sentimente”!, dovada aprecierii de care se bucura autorul studiului.

Cu certitudine, corespondența profesorului Nicolae Dragomir cu geografi a fost mai vastă, însă am abordat și semnalat – socotim noi – fragmente din cele mai elocvente exemple.

5. CONCLUZII

Din publicarea fragmentelor din corespondența inedită a profesorului Nicolae Dragomir cu cei doi mari geografi, George Vâlsan și Constantin Brătescu, se pot schița unele concluzii.

În primul rând, se remarcă raporturile sincere și dezinteresate dintre magistru și învățăcel, presărate cu sentimente de iubire și de prețuire reciprocă.

Apoi, se reliefează faptul că profesorul, savantul Vâlsan, era dublat de omul și de „cetățeanul” Vâlsan, pătruns de misiunea sa de formare a tinerelor cadre, a specialiștilor națiunii, care să ducă țara mai sus. Cu această misiune asumată – doar de aceea se făcuse profesor! – Vâlsan transmite neobosit, fără rezerve, cunoștințele sale tinerilor studenți de la Cluj, capitala Transilvaniei de curând unită cu România, cerându-le s-o cerceteze și să-i prezinte aspectele geografice specifice. Mai mult, „urmărind o studiere sistematică a Carpaților din punct de vedere geografic”, le cere studenților săi să cerceteze „târgurile pe înălțimi, viața în colibe și în baltă, harta drumurilor pastorale etc.”, sugerându-le „un plan amănunțit de monografie pastorală”.

Profund motivat și determinat în același timp, savantul și pedagogul Vâlsan caută să citească pe fețele studenților săi reacția lor la cunoștințele transmise și ce observă? Dintre cursanți se remarcă un tânăr care ședea „*cam prin fundul sălii*”, care „*lua mereu note*” și își privea profesorul „*cu ochi de lumină și de cutremur, ca la descoperirea unei vocații*!”. Relevându-i-se un element valoros și promițător, savantul nu ezită să-i îndrume pașii în cercetarea geografică, îndemnându-l să lucreze constant, scriindu-i: „*câte puțin, dar fă ceva în direcția aceasta*”.

Mentorul spiritual este și un mentor de viață; savantul nu ezită să dea și „*sfaturi pentru studenți*”, inclusiv lui Nicolae Dragomir ajuns de-acum profesor de liceu.

Altruismul magistrului se manifestă și în sprijinirea publicării studiilor fostului său student, recomandându-l anturajului său și după ce revine la București (1929). Nici nu se pune problema să semneze cumva alături de el!. În trecut fie spus, eu nu am găsit articole publicate în perioada interbelică cu doi sau mai mulți autori!!.

Devenit un foarte bun cunoscător al „*oieritului mărginenesc*”, Nicolae Dragomir este solicitat de profesorul Constantin Brătescu să publice în volumul omagial al „*Analelor Dobrogei*” ce marca douăzeci și cinci de ani (1913-1938) de administrație românească în Cadrilater, un studiu privind transhumanța mărginenilor în sudul Dunării, pentru a demonstra primatul elementului românesc de acolo. Se pare că profesorul clujean s-a achitat cu bine, întrucât neobositul cercetător al regiunii Mării Negre și redactor al analelor îi mulțumește pentru studiul care „*va împodobi cu cinste volumul festiv*”.

Prezentarea fragmentelor epistolare dintre George Vâlsan și Constantin Brătescu cu Nicolae Dragomir, ne dezvăluie personalități deosebite, caractere integre, atât ale celor care dau, care împărtășesc din cunoștințele și experiența lor, care promovează interesul național respectând realitățile, cât și al celui care primește învățătura și care se pune, la rândul său, în slujba formării și educării tinerei generații. Exemplul este demn de urmat, mai ales în prezent, când, de peste douăzeci de ani, în România bântuie o secetă năprasnică sub o ploaie de vorbe!.

* * *

Autorul mulțumește fiului cel mic al profesorului Dragomir, Domnului Viorel Dragomir, pentru bunăvoința cu care mi-a pus la dispoziție corespondența privată a tatălui său, precum și redacției revistei Studia UBB, seria Geographia, care și-a dat acceptul pentru publicarea acestui articol în limba română. Traduse într-o oricare altă limbă, scrisorile și-ar fi pierdut farmecul și forța ideilor transmise. În trecut fie spus, o revistă care se respectă, inclusiv una științifică, spre a fi în tonul învățăturilor programatice pe care ni le-a transmis George Vâlsan, publică în limba națională și servește națiunii. Intelectualitatea românească interbelică, atât de determinată în promovarea culturii țării noastre în lume, se ghida după aserțiunea unanim acceptată că „prin Poarta Națională se intră în Universalitate!”. Sigur că, în această lume globalizată, articole care ar putea interesa o comunitate științifică mai largă, este oportun să fie publicate în limbi străine.

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LEADERSHIP AND MANAGEMENT IN VOCATIONAL AND EDUCATION TRAINING¹

SILVIA IRIMIEA²

The CEDEFOP (The European Centre for the Development of Vocational Training) organises annually an impressive number of study visits which seek to increase the expertise of VET trainers and experts in various areas. The purpose of a study visit is to generate an exchange of experience and good practice between the country you visit and the countries the participants come from. Thus, participating in a study visit can be an exciting experience and an important learning tool.

“Leadership and management in VET” is such a program which brought together 17 decision-makers from 13 European countries for the purposes of learning more about the Finnish VET system, about other VET systems, exchanging views on how to meet the challenges of an efficient leadership in the changing world of a Europe under recession. The study visit took place during 23-28 April 2012 and was hosted by the Centre for International Mobility (CIMO), Helsinki, Finland. The Centre for Tourism Training of the Faculty of Geography, Babes-Bolyai University participated in the study visit program.

The topics discussed centered around the following topics: VET leadership, the Finnish Consortium approach to strategy and competence management, VET teacher training, forecasting skills needs, leading diversity – focus on the individual student.

The participants identified some *commonalities*, which can be summarised in the following issues:

- all countries agreed that developing the quality of leadership in VET is key to facing the challenges in a changing environment;
- differences are usually manifest in varying cultural backgrounds and levels of regulation;
- individualization & inclusive education are policies in most EU member states but the practice and operational implementation is at varying levels and presents similar challenges for a number of states;
- it is interesting to have seen the focus (and new reality) on VET in Finland, where more than half of the students are opting for VET education, a phenomenon which does not characterise many other EU countries;
- the close cooperative relationship in Finland between the Trade Union for teachers and the Ministry is quite unique, it helps the system to develop and introduces changes in this country;
- member states across the EU have a similar framework for a national curriculum to provide education for students from primary to doctoral level;

¹ Report on a CEDEFOP Study Visit.

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- individualization & inclusive education are policies in most EU member states but the practice and operational implementation is at varying levels and presents similar challenges for a number of states;

- a good example of sharing of teaching tools for adult education is carried out in France;

- quality assurance both now and in the future is seen as a pre-requisite for success in the long term delivery of appropriate vocational training;

- training for teachers and leaders is vital to the ongoing development of the profession (initial and Continuing Professional Development);

- leadership & Management training is generally available in each country although the design and delivery varies;

- reductions in funding were cited as a common concern both in the immediate past and expected further cuts in the near future;

- there was a common discussion as to whether leaders must, have been, or, are, teachers. If a teacher was also a good leader this was the best option;

- managerial and leadership knowledge and skills must be provided before or during a person's career in order to become an effective leader. In addition, a leader must also have ongoing continuing professional development to be effective and a true reflective professional;

- cooperation and continually developing links with employers was seen as vital to organisational effectiveness.

The differences between the participating institutions were grouped in the following items:

- differences are usually manifested in varying influence of cultural backgrounds on leadership styles. An additional influence was the varying levels of regulation and state direction that would sometimes allow leaders the strategic freedom whilst others were more constrained by regulation;

- several organisations differed as to whether a leader must also have teaching experience or a teaching qualification in order to be permitted the post, to have professional credibility or become fully effective. However, others felt the leader needed an awareness of pedagogy but not experience or expertise. This was a constant source of discussion;

- the overall strategic direction of each organization was defined by varying local and national levels of influence. For example some organisations had quite complex boards and structures that reflected local and municipal influence whilst others had a more internalised formation with less external influence;

- Finland had an expectation that degree level study would be followed automatically in most cases by a Masters whereas in some countries there is no such expectation or a degree of separation;

- there was an aspiration for all leaders to have some form of qualification but in some countries (e.g. Germany) a qualification was required even before an application could be made whereas in other countries (e.g. UK) no prior qualification was compulsory. Frequently, the differences within colleges and similar organisations – but not within commercial providers;

- suitable levels of quality assurance processes to ensure effective delivery of qualifications were not always evident or were only in the course of development. This was focused on provision but innately reflected the management effectiveness in running the organization.

The *challenges* faced by the representatives of the participating countries were summarized in the following issues:

- the future skills which will be needed by the labour market must be anticipated;
- the entire education system has to be very innovative and knowledge must be acquired from all parts of society;
- practitioners have to find a method to identify, on the one hand, what studies are the right ones for students and on the other hand, what will keep them in training until the end;
- the resource availability i.e. numbers of teachers, students (eg minimum number to form a group/class), lack of Government funding, inflexible systems and the attitude of teachers who often do not want to embrace new teaching responsibilities must be overcome;
- the adoption of the European Credit System and the transferability of credits must become common practices;
- the members of the training community need to understand which ideas can be implemented given the policy and cultural barriers;
- trainers must engage with minority groups;
- trainers must find adequate ways how best to engage with employers;
- VET trainers must understand what is meant by *quality* in a changing learning paradigm and how teachers may best proactively approach this situation in an economic environment where sources of funding are under pressure;
- for leaders and managers it seems difficult to properly organise continued training for VET teachers that is specific to the teaching of professions. We did see a good practice at the Haagen school and an extensive report by the Finnish National Board of Education endeavouring to understand the specifics of this. It is evident that there are large differences between countries regarding this issue;
- leadership issues appear to be the same everywhere but the manner that they can be addressed is widely different in different national systems;
- the systems of funding and the distribution of authority on education determines the ability to act effectively. This could mean that the transfer of good practices has to be monitored carefully to prevent disappointment;
- an area that is similar in VET in all countries is the *connection to companies*. The problems seem to be the same: how to interest and engage companies in VET training in cooperation with schools;
- an idea might be to encourage member states to develop their own 'best approach' as opposed to the EU setting out a 'one way' for all. The best approach might also be to consider a 'regional approach'.

At the end of the visit, the group suggested that:

- more activity between VET teachers and leaders at European level should be encouraged, for example by CEDEFOP and fund policy leaders. Vocational educational leaders need to support each other because vocational education is an important part of improving social mobility;
- there is a need to have specific support and groups for VET, as there are many for other groups such as "schools" but less so for VET providers, in particular. VET is different, has specific challenges and much to offer to learners, employers and the community, in general. The support should come from policy makers, industry bodies, employers and stakeholders;

- sharing IT and integrated Management Information Systems(MIS) would be instrumental in VET. This information would be useful to admissions managers, leaders in VET in general and possibly software developers in host countries;

- the importance for VET specific continuing professional development (CPD) to ensure relevant, timely and useful support should be given to VET leaders. This would be most useful in focussing on future trends and developments to ensure change or initiatives can be developed in time to meet the objectives. This would be best aimed at policy makers and providers to highlight the needs and wide opportunities that exist which may go unappreciated.

CONCLUSION

The development of Study Visit programmes has become extremely important in the European context as it allows trainers, teachers and, more recently, leaders or decision-makers to participate proactively in an exchange programme which is sought to continue the Copenhagen reform and the Europe 2020 Strategy. The programme is based on the EC education-regulated policy on VET, which is intended to make the link between the quality of education and the quality of teachers or trainers and the quality of leaders more visible and efficient for the learner.

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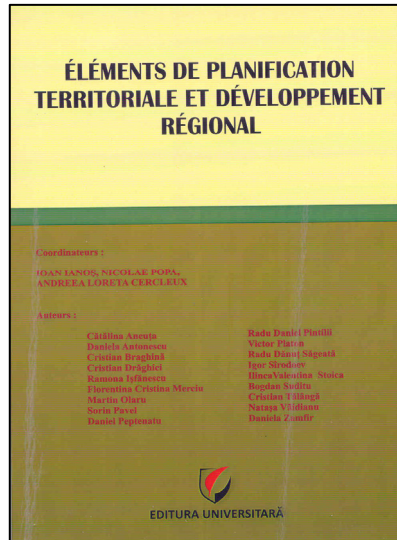
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In 2011, a collection of studies of the Interdisciplinary Center for Territorial Dynamics Advanced Research (ICTDAR) from the University of Bucharest was published, being coordinated by Ioan Ianoș, Nicolae Popa and Andreea Loreta Cercleux. The collective work represents an homage paid to the French geographer Jean-Baptiste Humeau, professor at the University in Angers.

The book "*Éléments de planification territoriale et développement régional*" – "*Elements of Territorial*

Planning and Regional Development" gathers seventeen studies of Romanian geographers from the Universities of Bucharest and Timișoara and from research institutes of the Romanian Academy, such as the Institute of Geography, the Institute of National Economy and from the Institute of Ecology and Geography in Chișinău, therefore from a widespread territory covering the West, East and South of the country.

The studies are grouped into three broad themes. The first group, comprised under the title "*Territorial Planning and Multiscale Regional Development*" focuses on issues of territorial planning and regional development at different territorial levels: European, national, regional and punctual local, concentrating on the human settlement, which usually represents the development pole. In this chapter there are seven studies, having both a theoretical-



conceptual and a practical approach. The chapter begins with the study "*Territorial Planning in a European and National Context*", in which the authors Cristian Tălângă, Daniela Zamfir and Ilinca Valentina Stoica emphasise the conceptual and relational framework of the territorial planning undertaking. In this approach, the authors review the latest concepts of spatial territorial planning for sustainable development. Also, by means of a theoretical study – "*New Theoretical Perspectives on*

Economic Development at a Regional Level" – Daniela Antonescu presents in a clear, synthetic manner the theories concerning economic localisation in the triad technological innovation – expanding industry – geographical landscape, which led to such a differentiated economic development. The study ends with the presentation of the current trends regarding the theories of regional development.

Victor Platon in his study "*The Demand Estimation for the Regional Infrastructure of Environmental Protection*" refers to the necessity of implementing an integrated infrastructure at a regional level, for environmental protection, mentioning the investment application in this field for the eight development regions of Romania, while Nicolae Popa in "*Entrepreneurial Initiatives and Regional Development: Concepts and Models in Europe*" analyses the entrepre-

neurial initiative – regional development binomial. Often ignored in ex-communist countries, the entrepreneurial initiative is a first-line element for economic development, contributing to what we call the “business environment”, the author emphasising the conceptual and definition framework and then, indicating the models found in the European Union and in Romania.

An interesting study with specific reference to the development region of Oltenia – we confess that we favour, for various reasons, the geographical and historical name of the eight economic development regions of Romania – is the study of Daniel Pieptănatu and Cristian Braghină “*The Importance of Development Poles in the Demographic Evolution of Localities*”. After the succinct presentation of the theoretical concepts, the authors describe the work methodology applied to the development poles of different taxonomic levels in Oltenia for a long period of time. This allowed them to highlight the polycentric network of development poles in Oltenia, the rank evolution, as well as a number of conclusions for a territorial subdivision, the Coșuștea Hills.

Radu Dănuț Săgeată addresses as a theme the relationship between territory arrangement and the territorial administrative division of Romania. In the first part of his study, “*Territory Arrangement and the Administrative Division. The Case of Romania*”, the author presents the successive territorial administrative divisions of Romania, starting with 1919 up to the present (with the exception of the one in 1938, the division of “regions”, which was an interesting one in terms of the associated spaces’ complementarity, but whose functionality could not be put to the test of time because it operated only between 1938-1940), with a sufficiently synthetic commentary on them. After presenting the shortcomings of the current territorial administrative division, the author suggests, based on solid arguments, a new territorial administrative division, mainly stalled on the geographical historical provinces.

Ioan Ianoși approaches to a very current theme for Romania in the context of the explosive growth of higher education, namely the strategy of inserting universities within the Romanian regions, “*The Strategy of Inserting Universities within the Regional Environments of Romania*”. After proving by arguments the assertion that “the university is the product of a territory with a number of features [...], that it is the result and it bears the imprint of a region”, the author presents the logical steps of the strategy of inserting universities in the regional ensembles within the logic of their development. In tackling the matter concerning the insertion degree of universities according to the regional development, the author uses two “work tools”: “*the tree of problems*” and “*the tree of goals*”, these two, being in fact, logical ascertaining and applying steps.

The second part of the work – “*Regional Development: - Case Studies*”, includes five case studies. Thus, Ramona Ișfănescu addresses the thoroughly discussed issue regarding the border viewed as a limit or an enhancer of the entrepreneurial initiatives, analysing the border of the Romanian region of Banat. In the study “*The Border: Barrier or Amplification Element of the Entrepreneurial Initiatives? Case Study: The Border Area of the Romanian Region of Banat*”, the author took into account the demo-economic development of the 32 administrative-territorial units near the border (villages and towns) in the period 1996-2006, concluding that the Hungarian border operates as a “*marginal area*” despite its important economic potential, while the Serbian one operates in a totally different manner, as a “*barrier*”!

A solid research into the tourism developed in the Mountains of Semenic is undertaken by Martin Olaru in the study “*Tourism in the Mountains of Semenic, Romania. Touristic Potential and Development*”, insisting on the area’s touristic potential and on the level of development of regional tourism,

highlighting the variety and quality of the transport infrastructure, accommodation and restoration as tourist attraction factors. In the same vein, is the study of Cristian Constantin Drăghici *"The Role of Touristic Activities in Regional Development. Case Study: The Area of Influence of Râmnicu Vâlcea Town"*. As it is well known, the residence town of Vâlcea County is close to a touristic area with rich thermal mineral springs, many monasteries, mountain landscapes, engineering works, which make the area extremely attractive, the author emphasising the need to continue the efforts in modernising the transport, lodging, restoration and balneation infrastructure.

Radu Daniel Pintilii is concerned with alleviating the regional disparities, which he addresses in the work *"The Alleviation of Regional Disparities through the Strategy of Polycentric Development. Case Study: The North-Eastern Region"*. After presenting the conceptual framework, the author directly starts presenting and analysing the development index from the North-Eastern Region, which is perfectly stalled on the urban network of polycentric development, between which he then identifies the structuring axes of development. In his opinion, the polycentric development can be an alleviating factor of the local disparities. In the same vein, Natașa Văidianu launches the question *"Which Are the Projections of Territory Development in a Sensitive Area? The Danube Delta in Romania"*, making reference to the sensitive area of the Danube Delta. A sensitive area due to many causes, mainly geodemographic and ecological, regarding which the author identified the components of potential development (ecotourism), as well as the ones "in crisis" (fishing).

The last part, the third one, with the theme *"Development and Urban Planning"*, includes five interesting case studies on post-communist urban development. Thus, in the study *"Ways to Urban Development in the Romanian Post-communist City"*, Sorin Pavel creates an interesting study on the

post-communist evolution of ten Romanian cities, highlighting their demographic decline, the decay and abandonment of some neighbourhoods, as well as the difficulties of remodeling the historic centers, which actually are identity neighbourhoods that need to be saved!

Andreea Loreta Cercleux and Florentina Cristina Merciu in the study *"Reflections on the Development and Management of Bucharest and its Metropolitan Area"*, share with us their reflections on the management of the development of Bucharest and its metropolitan area, this city which was beautifully developed by our predecessors in such a way that it was unanimously recognised in Europe as the "Little Paris"! How beautiful its development perspectives were..., but... the researchers insist on presenting the current difficulties, especially concerning the legislation which is not uniform, as well as the small real estate interests which negatively affect the development of this city that becomes more Balkan every day. Among interventions, the authors believe as timely solutions the social development and harmonisation, the development of transport infrastructure, the economic development, the proper management of resources and waste, the protection and capitalisation of the natural and architectural heritage.

An interesting study *"The Territorial Impact of the Residential Mobility in the Peri-Urban Area of Bucharest"* is undertaken by Bogdan Suditu, who approaches the matter in the context of the liberalisation of the real estate market, as well as of the enhancement of the polarisation function of Bucharest. Through a series of indicators such as the number of construction certificates issued, the number of housing units built, the number of newcomers, the dynamic of the newly built surface, the author manages to capture the unprecedented development of the peri-urban area of Bucharest. It would have been interesting to correlate these with the transport and territory equipment

infrastructure, which is insufficiently developed and does not precede the peri-urban development as it normally should.

"The Urban-Rural Relationships and Their Approach in the Territorial Planning of the Post-Communist Romania. Case Study: The Municipality of Timișoara" is the study of Cătălina Ancuța. After some theoretical and bibliographic considerations concerning the urban area and the urban-rural relationships, the author particularises the specificity of the urban development of Banat's capital, Timișoara, in a national context; we are of the opinion that it would have been more useful for the highlighting of the city's perspectives, if it had been studied in a regional context because Timișoara is the "capital" of a region and nowadays is the time of a regional Europe! Next the author captures in a professional manner the specificity of Timișoara's development, respectively the stages of its development, with emphasis on the stage following 1990, when Banat's metropolis retrieves and enhances its functions so beautifully rendered by the maps (A, B, C, D). Using seventeen indicators, the socio-economic disparities between Timișoara and its peri-urban area are emphasised, which makes their harmonisation objectives from PIDU (Integrated Development Plan of Growth Pole Timișoara) to be lengthy. Moreover, the author presents with accuracy the objectives of the development strategies of the growth pole Timișoara.

Igor Sîrodov from Chișinău wrote a beautiful and succinct study entitled "The Stages of Development of the Cities from the Republic of Moldavia". After classifying the 65 Bessarabian cities according to the size of the population and shortly presenting the seven urban agglomerations, the author divides in stages the development of the cities, identifying the prewar period 1812-1940, the period 1940-1944, the period after the war (1944-1994) and the Post-Soviet period,

after 1994. The division of the development of these Romanian cities in stages is debatable, it would have been more interesting to present the elements that led to this division. I was surprised that the Romanian period of those towns with their forthcoming potential was not covered; are we really abandoning the Bugeac completely? At least in our studies we should not abandon the unity of our Romanian ancestry, language and customs, to look around and pay attention to what others do!

The collection of studies ends with a "Postface" in which the coordinators of the volume pay tribute to Professor Jean-Baptiste Humeau from the University in Angers, for his passion in supporting the development of cultural and scientific bonds between French and Romanian geographers. The authors consider him to be someone who continues the tradition of the special cognitive-affective bonds which existed between the French geographers Emmanuel de Martonne, Robert Ficheux, Georges Chabot and Violette Rey and the Romanian cultural space, in the greater context of assuming, sharing and dispersing the perennial values of francophony.

The work, developed on 282 pages, having numerous illustrations, diagrams, maps, images, synthetic tables, an updated bibliography, includes advanced studies in the matter of territorial planning and regional development, being useful to both geographers, territory planners, urbanists, decision factors and to the enthusiasts of this field to whom we recommend it warmly.

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BALTĂLUNGĂ, ADRIAN-AUREL (2008), *România. Orașele porturi dunărene: geografie umană și economică* [Romania. The Danube Port Cities: Human and Economic Geography], Cetatea de Scaun Publishing House, Târgoviște, 323 p., 78 illustrations, 18 tables, 50 photographs, 6 annexes.

Cetatea de Scaun Publishing House from Târgoviște edited a work that was much awaited by geographers and the general public, which was able to update the human and economic geographic components of a major element of our natural environment, the Danube. As it can be observed, Mr. Adrian Aurel Baltălungă fills this gap and, after extensive research, he offers us a comprehensive study on the Romanian port cities, such a work being rarely seen lately. The structure of the work, as well as the latest information and updated statistical data and the cartographic illustration also, give the book a highly scientific character.

The work is very timely because the Danube became the main trans-European fluvial thoroughfare linking the North Sea and the Black Sea – area that is too scarcely economically exploited and towards which the interest of Europe is channeling nowadays. This work represents the author's doctoral dissertation, being structured in ten chapters.

In the first chapter, the author presents and describes the main morphometric elements of the Danube and its basin, which favoured even since ancient times the establishment of population and settlements throughout its trans-European course. As a navigable river, its main tributaries are presented, the navigation sectors, as well as the main fifty-three Danube ports, from which eighteen are Romanian. The author summarises the history of research regarding the Danube, insisting on the modern and contemporary ones, when the role of commercial and cultural vector of this "king of European rivers" has greatly grown, then specifying, in the third chapter, the favourability and restrictive factors – which were



not few!, in the emergence and development of the Danube port cities, pointing out the essential elements from a historical and evolutionary perspective.

Chapters four and five refer to the generations of Danube cities and ports, as well as to the development of ports as a reflection of historical development and of economic cycles, having consequences on the stages of development and on the changes occurred in their functional typology. The author felicitously succeeded to synthesise the emergence of Romanian port settlements, both chronologically and documentarily, to capture their original function and its development in time, most of the times in a progressive way, even though it encountered functional discontinuities also. The text is supplemented with syn-

thetic maps and old images of documentary and evidentiary value.

A dense and extensive chapter at the same time is dedicated to portuary traffic, which is the most synthetic indicator of a port-traffic – showing that the Danube polarises a transport system with points of convergence, which are the ports, thus being a major European transport axis, on which sailing ships under the Romanian tricolour flag were seen since 1834. The author identifies and analyses in terms of characteristic periods the freight and passenger traffic in Romanian ports, often in relation to other ports, and effectuates a series of multi-criteria typologies and rankings, such as the general freight traffic, the goods routes index, the proportion of intern/international goods, the number of ships etc., considering periods of times that enable him to draw valuable conclusions. The studies on the structure of goods, the destination of goods, the evolution of the number of ships are very elaborated.

Regarding the passenger traffic, the author observes something we all felt without knowing the extent of figures, which is that the passenger traffic in Romanian ports decreased by 457,4% in 2002 compared to 1938! Sad and depressing considering that the human traffic provides the dynamism and the picturesqueness of places!

The author makes interesting comparisons regarding the positioning of Romanian ports relative to other Danube ports, the traditional links with other ports, as well as the major arrangement projects of the fluvial navigation channels: Rhine-Main-Danube, Danube-The Black Sea, Sulina, in order to facilitate these links. The chapter ends with the exhaustive and evolutionary presentation of the Romanian Danube cities, accompanied by images, figurative and synthetic plans, the information being extremely dense.

Taking as a starting point the Morill port development plan, the author shows in chapter seven, the existing link between the portuary activity and the level of socioeconomic development of the Romanian

port cities, successfully managing to highlight the correlation between population size and the level of socioeconomic development within their hierarchy (illustrations 56, 57).

The chapter *“Urban Morphologies Specific for Ports”* is also a “dense” chapter of study, in which the author regards the materialisation of demographic evolution and development of ports, which shows the specificity of each port. Urban population density, the size of green spaces, urban morphology, the organisation of industrial space are analysed. Depending on a number of criteria, such as geographical location, the complexity of functions and infrastructure, the port traffic volume, the loading/unloading capacity, the arranged area of ports, the storage capacity, the existent shipyards and/or the repair shops, the author created an entire series of Romanian port typologies, very current and necessary, transposed into synthetic maps also.

A particularly interesting and present alike chapter is entitled *“Urban Ecology of the Danube Ports”*. Since the Danube is a great source of water for the population and its activities, the author attaches importance to the quality of the river’s waters, indicating four quality categories which he analyses in a series of Romanian ports, insisting on the frequency variation of the inadequate samples. A much analysed matter was the one concerning the dumping of noxae into the Danube and in the environment related to portuary and industrial activities: domestic wastewater, industrial water, noxae, dust, as well as spontaneous or circumstantial pollution sources. Interesting facts are presented to the reader regarding the vulnerabilities of fluvial traffic in relation to the water level fluctuations following the periods of prolonged drought. I found the approach of the types of landscapes generated by portuary activities and of the images of port cities to be very synthetic and interesting, the author identifying geographical portuary landscapes of remarkable vitality, which is the case of the group Galați-Brăila, in a constant devel-

opment, but with great underlying possibilities, the case of Giurgiu, Tulcea, geographical portuary landscapes in different degrees of decline, where surprisingly ports such as Drobeta-Turnu Severin, Orșova, Calafat, Călăraș belong, thanks to the local crass indifference! But hope never dies, in the last chapter “*Trends of Development of the Danube Romanian Port Cities*” the author presenting the revival opportunities for some of the declining ports. The restructuring and adjustments in the Romanian economy included the Danube ports, the author identifying and materialising them in synthetic maps. A real possibility of revival for some of the Danube port cities is declaring them as belonging to the free portuary zones, about which the author undertakes an analysis at a regional level and into the past of some port cities, presenting afterwards the current free zones.

Having positive prospects regarding economic recovery, the ports Calafat, Turnu Măgurele and Călăraș stand out, which could become important bridgeheads across the Danube that are to be considered, afterwards contributing to the polarisation of transports and activities, while Orșova, Drobeta-Turnu Severin, Oltenița, Giurgiu, Tulcea, Sulina have touristic potential.

In conclusion, the Danube Valley, as a polarisation axis for transport and activities, has great prospects for sustainable development, at a time when the Black Sea Basin as an economic region is of interest for the Central and Western European countries, the author highlighting its potential.

The dense and diversified information, the logical structure of ideas in the scientific endeavour, the clear, succinct and synthetic text, the high-quality cartographic material that harmoniously complements the text, are all attributes that make reading enjoyable and invest this book with qualities that are rarely incorporated in a single book. Every mature or becoming geographer should have this book, even more, I recommend it to all who are interested in the geographic and cultural Romanian space, to the general public. I find its translation in English to be very appropriate, which would prompt it, surely, to be one of the most appreciated books in this field.

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**Nicholas Clifford, Shaun French, Gill Valentine (eds.) (2012),
Key Methods in Geography, second edition, London, Sage, 545 p.,
ISBN 978-1-4129-3508-1**

Key Methods in Geography (with a first edition in 2003) is part of a series of excellent and well-known books (such as Phil Hubbard, Rob Kitchin, Gill Valentine (eds.), *Key Thinkers on Space and Place*, 2004 and Nicholas Clifford, Sarah L. Holloway, Stephen P. Rice, Gill Valentine (eds.), *Key Concepts in Geography*, 2003, and second edition in 2009).

The authors of the 32 essays (chapters) in this book offer a useful overview of geographical research from three distinct perspectives: how to plan, how to execute, and how to present research, while researchers are to pay attention also to issues of health, safety, and ethical research.

As all geographers, either at the beginning, climax, or at the end of their career, need to do research, this book provides the best insight in the key methods of Geography, giving them advice in a thoughtful and clear way, approaching themes such as project design, the things to take into account when selecting the appropriate method/methods, data analysis, and presentation of research results.

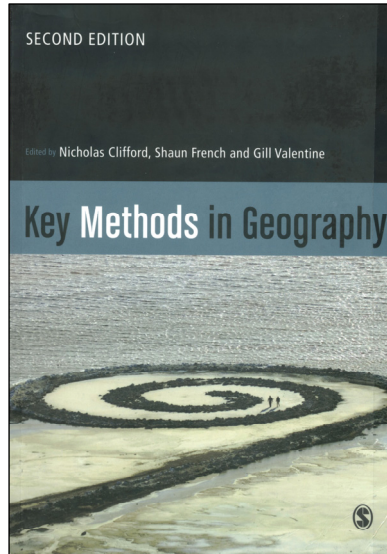
The book is a stimulating and necessary reference text especially for undergraduates, for those who need to write their undergraduate dissertations and master theses in Physical Geography, in Human Geography, and in Regional Geography, as it hosts both quantitative and qualitative research methods. These are presented in a comprehensive manner by geographers who are the experts in their fields.

Still, also postgraduate research may find it useful as its second edition includes the latest developments in the use of research methods, together with an up-to-date reference list. It presents traditional methods and numerous new methods making use of modern technology.

Therefore, it is highly recommended as essential reading throughout a three year Geography programme at least, as well as for graduates doing an independent research.

This excellent text on methods in Geographical research is written in an accessible style and offers many practical examples, illustrative for all members of the Geography community interested in conducting quality Geographical research. Especially due to the detailed presentation of qualitative methods, it fits well with course goals in Regional Geography research methods.

Key Methods in Geography has four parts: *Getting Started in Geographical Research* (pp. 1-58), *Generating and Working*



with Data in Human Geography (pp. 59-201), *Generating and Working with Data in Physical Geography* (pp. 203-313), and *Representing and Interpreting Geographical Data* (pp. 315-527) including 32 chapters.

Chapters begin with a short definition of the presented method, followed by an abstract of the main arguments and then by an approximately 5,000-word discussion including illustrative case studies and annotated notes for further reading and research.

Part One is made of four chapters, all meant to

help beginners get started in geographical research. These are: *Getting Started in Geographical Research: How This Book Can Help*, *How to Conduct a Literature Search*, *Ethical Practice in Geographical Research* and *Health and Safety in the Field*.

Part Two, including ten chapters, focuses on qualitative methods in Human Geography: *Making Use of Secondary Data*; *Conducting Questionnaire Surveys*; *Finding Historical Sources*; *Semi-Structured Interviews and Focus Groups*; *Participant Observation*; *Geography and the Interpretation of Visual Imagery*; *Participatory Research Methods*; *Working in Different Cultures*; *Internet Mediated Research* and *Diaries as a Research Method*.

Part Three includes six chapters making use especially of quantitative research methods: *Getting Information About the Past: Palaeo and Historical Data Sources of Climate*; *Making Observations and Measurements in the Field*; *Sampling in Geography*; *Analysing a Natural System*; *Numerical Modelling in Physical Geography: Understanding Explanation and Prediction in Physical Geography* and *Using Remotely Sensed Imagery*.

In addition, Part Four includes 12 chapters, ten of them using quantitative, others qualitative methods from which researchers

should choose the most appropriate one in order to represent and interpret geographical data: *Data Handling and Representation; Mapping and Graphicacy; Using Statistics to Describe and Explore Data; An Introduction to Geostatistics; Using Geographical Information Systems; Statistical Analysis Using PASW (formerly SPSS); Coding Transcripts and Diaries; Computer Assisted Qualitative Data Analysis; Analyzing Historical and Archival Sources and Analysing Cultural Texts.*

In order to help undergraduates present the results of their research, at the end of this text book, editors included two chapters: one on *Writing Essays, Reports and Dissertations* and the other one on *Understanding Assessment*. The latter is important for students to know which are the standards

for assessing their work and thus helps them to observe these standards in order to make progress.

At the end of the book, there is a helpful glossary (pp. 528-536) and an index.

We recommend this excellent, impressive, comprehensive, and up-to-date book, offering clear insights into the key methods of geographical research, both to beginners and experienced researchers, and also to geographers redesigning their academic courses on research methods.

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Ion, Bold, Avram, Crăciun (2012), *Organizarea spațiului agricol. Concepte - Tradiții - Istorie (Organization Of Agricultural Space. Concepts - Traditions - History)*, Mirton Publishing House, Timișoara

The latest release of the book ORGANIZATION OF AGRICULTURAL SPACE - CONCEPTS - TRADITIONS - HISTORY, Mirton Publishing House, Timișoara, 2012, has been a scientific and editorial event of a particularly significant editorial novelty; the book belongs to PhD engineers, chief designers: Ion Bold and Avram Crăciun.

Scientifically and historically grounded, the book focuses attention on an activity and science to the benefit of which the authors spent 50 years of their life, materializing the interplay between humans and nature in the use of the territory and in the coordinated placement of various uses, facilities and equipment, taking into account the way in which territory and settlements are arranged (organized and planned).

It is a synthesis paper, the outcome of a long research and design process, following a trajectory from the particular to the general, from the concrete to the abstract; using an integral thinking and an interdisciplinary

approach, the authors created a territorial organization system, aiming at the sustainable and harmonious development in the entirety of various territorial units.

Approaching the synthesis as a system and science of territorial organization – a premiere in terms of approach and substantiation – the book allows a more comprehensive understanding of the problems in their historical evolution, as well as the integration of the territory into a complex concept, intercalating various positive and negative factors in order to define economically, socially and physically optimal solutions in the field, by means of arrangement, restoration, planning, modeling, fitting and equipment. Issues are approached systematically, following a trajectory from the general to the particular, from the territorial and settlement planning to the arrangement of the territory among units (land agglomeration and borderline rectification) and the management of the territory within differ-

ent units (land exploitation, farms), respectively of various uses of land (arable land, trees and vineyards, grass land etc.).

The process requires the understanding – the association and dissociation of the evolutionary phenomenon – based on an original historic classification – because, although it is different at present, it can have a sequence of similar causes and effects, having as feature the continuity, confirming that territorial organization is simultaneously an old and a new activity – old due to the long human activity in territory exploitation, new due to the content it acquired in the modern and contemporary times, by permanently revealing the interplay between humans and nature.

In this context, concepts appear to be characterized by generality and universality, while differences are influenced by various historical moments and national and regional particularities, thus contributing to a more comprehensive understanding of territorial organization issues.

This is the living proof that the authors were creative and action people, in their capacity as researchers, designers and teachers, contributing both to the accomplishment of agricultural and rural territorial organization in general, as well as to the substantiation and assertion of territorial organization as a scientific discipline.

Furthermore, by going beyond existing concepts, they created new understanding and action perspectives, synthesizing issues and making them general, starting from the idea that any activity must be found in the general, universal range of information in order to be known by the large public - this opens new doors in the confirmation of universally and generally acknowledged truths and laws in the evolution of the science of territorial organization.

Following the improvement they made in territorial organization and the generalization of the national system of territorial organization, the authors created new valences in agricultural and wood land organization, highlighting that the most important element is the rational use of the main

capital good – the land, as basis for the achievement of viable structures required for the exercise of execution functions of production and work, integrated in the balanced economic and social development of territory and settlements.

This is due to the fact that, basically, each production method is associated with a certain territorial, economic, social, technical and administrative structure – given that the production process is mainly a transformation process of nature (arrangement, planning, fitting, equipment) having regard to the level of society development, territorial organization being the only way to coordinate spatial elements with the envisaged development, becoming a global optimization tool for land use according to the present and future requirements of the society, closely connected to the entire natural, economic and social balance.

Logically structured, the book has 7 chapters: Territorial Organization – in the Spotlight; Objectives of the Main Activities of Territorial Organization; Landuse Fund – as a Production Method and Element of Territorial Organization; Territorial Organization – Generating Factor of the Coordinated Development of Rural Areas; Cadastre and Territorial Organization – a Continuous Relationship in Becoming Familiar with and Managing Land Resources; The Evolution of Agricultural Territorial Organization in Romania; Annexes: Plans and Sketches Regarding Agrarian Territorial Organization.

Through its content, the book speaks about Agricultural Territorial Organization as a complex technical and economic activity, whose role is to create economic agrarian structures through land agglomeration (eliminating dispersal, fragmentation, disintegration), through the placement of various usages in compact real estate complexes, within optimally located and adjusted exploitations and farms, with the surrounding land adequately organized respecting the natural conditions (relief, soil, hydrology, climate), according to the development techniques (hydrotechnical, biological, agrotechnical), water distribution in soil

(irrigation, draining), cultivable land systems (crop rotation, strip cropping, grassy strips, agroterraces), modification of biological soil conditions (soil amendment, fertilization), differentiated organization of each usage in units of optimal sizes and forms (fields in rotation, strip grounds, lots, roads), constantly ensuring the rational use and the conservation of natural resources, fittings and technical equipment.

These secular activities have been performed by means of a constantly improved and developed system, especially over the past 50 years, after the creation within the Ministry of Agriculture of the Institute for Agricultural Studies and Design – ISPOTA (HCM 1240/1953) and the Institute of Geodesy, Photogrammetry, Cartography and Territorial Organization – IGFCOT (HCM 87/1971 and Decree 207/1973), dealing with research, technological engineering and design, whereas at the level of counties – the Office of Cadastre and Agricultural Territorial Organization – OCOTA.

IGFCOT and OCOTA efficiently used a unitary system of measurements, land registration plans and maps on different scales, meeting all the requirements of the national economy, of the geodesic and cartographic data bank, of the cadastral data bank, as well as a unitary system for territorial organization.

All this activity, having its own executive structure for terrestrial measurements, cadastre and territorial organization, created and equipped by the Ministry of Agriculture, has been transferred under the area of competence of the Ministry of Administration and Home Affairs (at the request of an unprofessional minister of agriculture, priest Ilie Sârbu, so that he should avoid being asked questions regarding the enforcement of law 18/1991). Considering the diversity of the property forms and the land use, this activity should have been by all means subordinated to the Ministry of Agriculture. Furthermore, ignoring the provisions of Chapter VII of Law 18/1991 - Law on land fund, Territorial organization and planning have been abusively dissolved as an activity.

Consequently, the Ministry of Agriculture has been deprived of its main technical instrument which used to make possible the systematic and permanent familiarity with the land fund - from a quantitative, qualitative and legal point of view, respectively surface, use and owners, as well as of those bodies in charge with the creation of viable agrarian structures based on territorial organization and planning. As a result, some of the negative effects were: no inventory of land, no statistics of owners, uncultivated land and irrational use of land, the uncoordinated placement of investments, the lack of designing activities for the organization of viable exploitations through agglomeration, association, farming and the implementation of rational agricultural systems which are recommended by the field of scientific research, failure to use EU funds, failure to have a real tax and duty basis etc., failure to achieve a coordinated development of rural areas.

It is worth mentioning that the lack of territorial order, the dispersal and fragmentation (47 millions of lots compared to 22 millions of lots before the war) had the following consequences: 1/3 of the agricultural land is not cultivated, the impossibility to ensure the increase of the agricultural production resulting in the import of agricultural and food products.

As a matter of fact, with a view to accelerating the process of general cadastre, Law 7/1996 – Law on cadastre, established the National Department for Cadastre, Geodesy and Cartography which, via a number of other laws (Law 590/2001 on the organization and functioning of the National Department for Cadastre, Geodesy and Cartography, GEO no. 70/2001 regarding the replacement of the general cadastre with the agricultural cadastre, Law 308/2001 on the transfer of the national cadastre body under the competence of the Ministry of Administration and Domestic Affairs, GO no. 41/2004 regarding the amendment and supplement of the law on cadastre no. 7/1996, Law 499/2004 on the establishment of the National Agency of Cadastre

and Real Estate Advertising, GD no. 1210/2004 on the organization and functioning of the National Agency of Cadastre and Real Estate Advertising etc., which was transferred at the end of the year 2011 under the competence of the Ministry of Regional Development and Tourism) generated the dissolution of agricultural territorial organization, the development of some extremely convenient structures to the benefit of cadastre, turning an activity to be performed in the field into an activity to be performed in an office - mostly focusing on the legal circulation of land and real estate goods. It is striking that the institution in charge with this activity (a now autonomous institution - "state within state") has failed over the past 15 years to perform the cadastre in any of the communes in Romania, even though this was its main lawfully established activity. We highlight that this complex Agency has only been concerned to deal with the urban cadastre in city and town areas and to obtain direct material advantages in its relations with the citizens regarding the legal circulation of land and real estate assets; at the same time, the rural area (95% of the territory of Romania) is dominated by chaos; there is a deficiency of information concerning the land fund and territorial agglomeration and organization, in the context of property forms diversification.

Under the circumstances, the only viable solution has in view the transfer of this activity (cadastre) from the Ministry of Regional Development and Tourism back to the Ministry of Agriculture and Rural Development and its reorganization as General Direction (instead of Agency) in order to be efficiently coordinated and controlled. It is also of great importance to go back to the former structure (OCOTA + IGFCOT), also covering agricultural territorial organization, thus bringing back into existence the main body in charge with the inventory and rational use of land, the establishment of a viable agrarian structure with agglomerated and organized lots of land, with a view to implementing rational agricultural sys-

tems which are recommended by the field of scientific research.

This necessary reorganization, whose main objective is to revive the activity in the field of Cadastre and Territorial Organization, has a double effect: carrying out the technical, economic and legal evidence (respectively the identification, description and entry into cadastral documents of all buildings - land with or without constructions - existing in the entire country, regardless of their destination and owner, with a view to registering them in the Land Register), as well as the accomplishment of agricultural territorial organization and planning, arrangement of agricultural exploitations without which agriculture cannot fulfill its functions because it requires the existence of economically viable agrarian structures, having a territorial stability - as basis for the implementation of rational agricultural systems which are recommended by the field of scientific research.

As a conclusion, we underline that we have had many occasions to talk to the authors of this book, appreciating the passion, the methodical, rational and balanced spirit, as well as the capacity to analyze, correlate and synthesize of these people with tireless minds and generous hearts, endowed with dignity and devoted to real values and the general welfare.

Consequently, the book fills out an empty place in the specialized literature and supplements the concepts already developed, being one of the most valuable informative and documentary works in this field of activity; it also brings joy to those who have always showed interest and preoccupation for territorial organization, whereas it makes decision-making factors aware of the fact that the future of the Romanian agriculture depends on territorial organization.

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