



Consiliul Județean Bistrița-Năsăud



Complexul Muzeal Bistrița-Năsăud



**COMPLEXUL MUZEAL
BISTRIȚA NĂSĂUD**

STUDII ȘI CERCETĂRI
Geology-Geography

22

BISTRIȚA

2017

**COMPLEXUL MUZEAL
BISTRIȚA-NĂSĂUD**

STUDII ȘI CERCETĂRI

Geology-Geography

22

**BISTRIȚA
2017**

EDITORIAL BOARD

OF

Series Geology-Geography

Published by the Museum of Bistrița-Năsăud, Natural Sciences Section

Editorial office: 19 Gen. Grigore Bălan St.

420016 BISTRIȚA

Phone: 004 0263.211.063

Fax: 0263.230.046

Editorial Board (in alphabetical order):

Reader Marcel BENEĂ, Ph.D., „Babeș-Bolyai” University,

Cluj-Napoca

Professor Mihai BRÂNZILĂ, Ph.D., „Al. I. Cuza” University, Iași

Professor Nicolae CIANGĂ, Ph.D., „Babeș-Bolyai” University,

Cluj-Napoca

Professor Vlad CODREA, Ph.D., „Babeș-Bolyai” University,

Cluj-Napoca

Senior Researcher Sorina FĂRCAȘ, Ph.D., Institute of Biological Research,

Cluj-Napoca

Reader Nicolae HAR, Ph.D., „Babeș-Bolyai” University, Cluj-Napoca

Professor Bica IONESI, Ph.D., „Al. I. Cuza” University, Iași

Reader Mircea MUREȘIANU, Ph.D., „Babeș-Bolyai” University,

Cluj-Napoca

Professor Dănuț PETREA, Ph.D., „Babeș-Bolyai” University, Cluj-Napoca

Editor in Chief:

Senior Researcher III Marius HORGA, Ph.D.

Editorial Secretary:

Lecturer Ioan BÎCA, Ph.D., „Babeș-Bolyai” University, Cluj-Napoca

Scientific Reviewers:

Lecturer Ioan BÎCA, Ph.D., „Babeș-Bolyai” University, Cluj-Napoca

Senior Researcher Ioan CHINTĂUAN, Ph.D.

Professor Vlad CODREA, Ph.D., „Babeș-Bolyai” University,

Cluj-Napoca

Senior Researcher Sorina FĂRCAȘ, Ph.D., Institute of Biological Research,

Cluj-Napoca

Reader Mircea MUREȘIANU, Ph.D., „Babeș-Bolyai” University,

Cluj-Napoca

Professor Călin Cornel POP, Ph.D., „Babeș-Bolyai” University,

Cluj-Napoca

Reader Ioan RUS, Ph.D., „Babeș-Bolyai” University, Cluj-Napoca

Responsabilitatea pentru conținutul articolelor revine în exclusivitate autorilor.

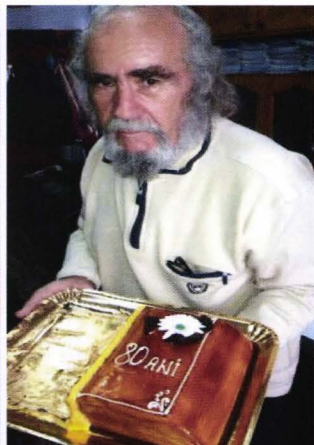
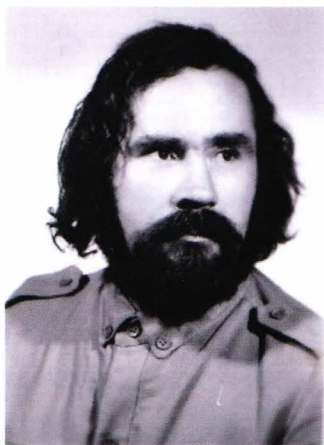
Editura Ecou Transilvan

ISSN 2069 – 1513

CUPRINS. CONTENT. SOMMAIRE. INHALT

Lia-Maria CIOANCA, Marius HORGA, OMUL ȘI GEOLOGUL NICULAE VRĂSMAȘ LA CEAS ANIVERSAR	5
GEOLOGY	13
Marius HORGA MINERALOGICAL-PETROGRAPHICAL STUDIES ON THE LATE BRONZE AGE CERAMICS FROM STUPINI ARCHAEOLOGICAL SITE (TRANSYLVANIA, ROMANIA)	15
GEOGRAPHY	25
Marius POPESCU TOURISTIC MANAGEMENT OF RURAL NATURAL HERITAGE FROM SOUTHERN DOBROGEA	27
Eduard SCHUSTER, Helena SCHUSTER IDENTIFICATION AND VALORISATION OF CULTURAL LANDSCAPE ELEMENTS IN THE APOLD-ORĂȘTIE VALLEY DEPRESSIONS	39
Lia-Maria CIOANCA THE TYPOLOGY OF CULTURAL LANDSCAPES IN THE BÂRGĂU AREA	51
Eduard SCHUSTER, Andras-Istvan BARTA A BIKE TOUR PROPOSAL TO THE MINERAL SPRING SPAS OF THE HARGHITA MTS., ROMANIA	59
Ioan BÎCA CULTURAL VALUE OF MOUNTAIN PEAKS FROM ROMANIAN CARPATHIANS	71
Călin Cornel POP, Cătălin Daniel POP, Cerasela SĂPLĂCAN, Cecilia PINTEA INDUSTRIAL GROUPINGS AND SETTLEMENTS. UNITS AND STRUCTURES IN THE FORM OF GEOGRAPHICAL AXES	79

OMUL ȘI GEOLOGUL NICULAE VRĂȘMAȘ LA CEAS ANIVERSAR



Niculae Vrășmaș s-a născut la 3 noiembrie 1939, în comuna Prundu Bârgăului, jud. Bistrița-Năsăud. A urmat cursurile medii și universitare la București, a absolvit Facultatea de Geologie-Geografie, secția geologie, în anul 1964, a efectuat apoi și studii post-universitare de prospecțiune, explorare și exploatare a resurselor minerale, cursuri de limba engleză și atestare PC.

A activat de-a lungul timpului în mai multe unități, având ca profil cercetarea geologică, și anume: ISEM (1964-1966), IGEX (1966-1970), cu sediul în București, IPEG Harghita, Miercurea Ciuc (1970-1975) și PROSPECTIUNI București (1975-1999), îndeplinind mai multe funcții de conducere și cercetând aproape întreg teritoriul țării, până în 1999, când s-a pensionat, dar a continuat să lucreze la mai multe firme private, în domeniul resurselor minerale și a mediului.

După reîntoarcerea sa din București în locurile natale, a activat ca și consilier local ales, la Prundu Bârgăului, unde principala sa activitate, după anul 2001 s-a desfășurat în domeniul publicisticii, îndeosebi la Casa de Presă „Răsunetul” Bistrița, precum și la alte ziare și reviste locale sau naționale. Din primăvara anului 2005 și până în prezent, lucrează ca redactor responsabil la „Gazeta de Bârgău”, supliment al ziarului „Răsunetul de Bistrița-Năsăud”, fiind și redactorul fondator al revistei „Anuarul Bârgăuan” - Știință, Cultură, Arte și Literatură, ajunsă la al nouălea volum (2011-2019).

Pe parcursul activității la Întreprinderea de Prospekțiuni Geologice și Geofizice, din București, a activat la Cenaclul literar „Simion Mehedinți”, iar din 1999 a devenit membru al Cenaclului literar „George Coșbuc” din Bistrița, mai apoi membru al Societății Scriitorilor din județul Bistrița-Năsăud, al Societății Scriitorilor Bistrițeni „Conexiuni”, membru fondator al Clubului Cultural Internațional „Boemia” și membru al Uniunii Ziariștilor Profesioniști din România. Pe lângă toate acestea, este și membru fondator al Fundației „Plaiurile Bârgăului”, al Societății culturale „Speranța reînviată”, președinte al Fundației culturale „Valea Bârgăului” și Cetățean de Onoare al comunei natale, Prundu Bârgăului (<https://www.bjbn.ro>).

În cercetarea geologică a intrat cu adevărat după absolvirea facultății, în anul 1964, când a fost repartizat la ISEM – Întreprinderea de Stat pentru Exploatarea Miniere, București, în cadrul căreia a fost atașat echipei din Munții Călimani, condusă de Emil Butnaru, unde i-a avut colegi pe Cristian Prishack și Ioan Coriolan Balintoni (în prezent membru corespondent al Academiei Române), cu care a urmărit lucrările și a efectuat documentațiile geologice privind rezultatele explorării, cu galerii și foraje, pentru sulf nativ (1964-1967), Niculae Vrăsmaș având și responsabilitatea cercetării hidrogeologiei zăcămintului. A efectuat ulterior, în cadrul Întreprinderii „Prospekțiuni” București, lucrări de prospekțiuni geologice în extinderea eruptivului neogen, care au avut ca obiectiv prioritar mineralizațiile din Munții Călimani și Bârgău (Anuarul Bârgăuan, 2017).



Fig. 1. Niculae Vrăsmaș în "câmpul muncii"
(foto Arhiva personală Niculae Vrăsmaș)

Activitatea profesională ca geolog, alături de cea a altor colegi, a fost reflectată și în presa vremii, în numeroase articole, reportaje, emisiuni radiofonice și de televiziune, în cadrul filmelor documentare, dintre care amintim "Geologii din Călimani", "Căutătorii de comori", "Scânteia Tineretului", "Reporter în nord" (Vrăsmaș, 2017).

"Lucrările de prospecțiune geologică efectuate în Munții Călimani au identificat "pălăria de fier" din Negoiul Românesc, a cărei explorare geologică a început prin Șantierul ISEM Gura Haitii, cu lucrări miniere și de foraj care au condus la descoperirea unor mineralizații de sulf nativ, situate în adâncime, a căror cercetare s-a accentuat în anii '60-'80, zăcământul conturat întrând ulterior în exploatare. Rezervele calculate prin lucrările de explorare sunt considerabile, iar zăcământul de sulf din Călimani, la care se mai adaugă și alte câmpuri solfatarie din vecinătate, este unul dintre cele mai mari din lume. Din păcate însă, metoda de preparare aleasă de conducerea comunistă a fost neadecvată și falimentară. S-au cheltuit sume enorme, care nu au contribuit la o valorificare superioară a investițiilor, din contră au produs o poluare asupra întregului bazin hidrografic și a drumurilor din frumoasele stațiuni bucovinene, spre diferite locuri din țară, violentând și mutilând natura și distrugând mirificul peisaj al acestor locuri" (Vrășmaș, 2017).



Fig. 2. Niculae Vrășmaș (stânga) în Colectivul de sinteză al Carpaților Orientali
(foto Arhiva personală Niculae Vrășmaș)



Fig. 3. Halda Galeriei Dornișoara



Fig. 4. Gura Galeriei Dornișoara

(foto Arhiva personală Niculae Vrășmaș)

<https://biblioteca-digitala.ro> / <https://complexulmuzealbn.ro/>



Fig. 5. Ruinele Coloniei miniere
Dornișoara

(foto Arhiva personală Niculae Vrăsmaș)



Fig. 6. Locul grupului electrogen al
Galeriei Dornișoara

Niculae Vrăsmaș a participat la numeroase acțiuni culturale, din țară și din județ, precum și la simpozioanele culturale, anuale, ale Văii Bârgăului, începând de la sfârșitul anilor '70, dar mai cu seamă după anul 2000, când s-a alăturat organizatorilor și a participat cu numeroase comunicări, axate, în principal, pe domeniul monografic. Din anul 2009 a devenit principal organizator și moderator al simpozionului și a fondat ulterior un anuar al lucrărilor prezentate, care apare din 2011 și până în prezent, având ca principală temă „Țara Bârgaielor”.

Revenirea din capitală în locurile natale i-a permis participarea cu lucrări științifice la sesiuni aniversare, desfășurate în localitățile Bistrița Bârgăului, Prundu Bârgăului, Susenii Bârgăului, la Colocviile comunei Josenii Bârgăului, la festivalurile „Fire de tort”, ținute la Reteag, Mănăstirea Salva, Runcu Salvei, Coșbuc, Năsăud, Maieru, Teaca și Bistrița, la Saloanele Rebreanu, Saeculum, Beclean și ASTRA Năsăud. Cea mai mare parte a activității sale a constat în cercetarea trecutului ținutului nord-est transilvan și a Țării Bârgaielor, în special, prin studiul arhivelor și observații de teren efectuate (<https://rasunetul.ro>).

Niculae Vrăsmaș a debutat literar în revista “Vatra” nr. 9 din septembrie 1988 (Țârgu Mureș), cu fragmente din *Memoria jurnalului: Radu Petrescu*, într-un grupaj literar, intitulat *Memoria jurnalului: Radu Petrescu*, alcătuit de Ioan Ilieș. A intrat în publicistică, a colaborat la cotidianul „Răsunetul” și a lucrat, din 2005, ca redactor și apoi redactor șef la „Gazeta de Bârgău”, supliment care apare cu sprijinul Casei de Presă „Răsunetul de Bistrița–Năsăud” și a primăriilor din Valea Bârgăului (Anuarul Bârgăuan, 2017).

A contribuit de asemenea cu peste 50 de studii, eseuri și articole, preponderent pe teme de cronologie, toponimie, etnografie și folclor, memorialistică, istorie și critică literară, la următoarele publicații culturale:

„Vatra” (Târgu Mureș), „Revista Ilustrată” (Bistrița), „Mișcarea literară” (Bistrița), „Eco Terra” (Cluj-Napoca), „Ferma” (Timișoara), „Arhiva Someșană” (seria a III-a, Cluj-Napoca), „Vatra veche” (Târgu Mureș), „Dacia literară” (Iași), „Cuibul visurilor” (Maieru), „Mesagerul”, „Mesagerul literar și artistic”, „Răsunetul” și Gazeta de Bârgău” (Bistrița) (Anuarul Bârgăuan, 2017).

Lucrările publicate până în prezent sunt numeroase, putem enumera următoarele volume: *Regele brazilor și folclorul*, Editura „Europres” Bistrița, 2005, *Prundu Bârgăului, o vatră străveche*, vol.1, Editura „Karuna” Bistrița, 2007 și *Jurnale paralele (Radu Petrescu văzut de un elev al său)*, Editura „Eikon”, Cluj-Napoca, 2008, care a primit Premiul pentru debut literar în volum, la Concursul Național de Proză a celei de a XXVI-a ediție a Saloanelor „Liviu Rebreanu”, noiembrie 2008, dar și Premiul pentru beletristică – proză, al „Anului editorial 2008”, oferit de Biblioteca Județeană „Octavian Goga” din Cluj-Napoca. A mai publicat deopotrivă *Un brad intrat în legendă - Regele Brazilor în literatură și folclor*, editura Eikon, Cluj-Napoca, 2010, o ediție nouă, îmbunătățită cu date noi privind evoluția folclorului bârgăuan în ultimele patru decenii, a îngrijit o serie de articole postume și volumul omagial *Nori dantelați – Nuages dentelés*, cuprinzând poeme ale poetului bârgăuan Teo Vršmaș, în traducerea lui Florin Avram, apărut în ediție bilingvă, română-franceză, la Editura „Eikon”, Cluj-Napoca, 2008, precum și volumul omagial *Un secol de viață*, dedicat marelui dascăl bârgăuan Albu Matei (<http://www.ziare.com>).

În anul 2015, Niculae Vršmaș a publicat volumul *Moștenirea lui Fabian*, apărut la Editura „Casa Cărții de Știință”, Cluj-Napoca, sub egida Bibliotecii Județene „George Coșbuc”, lucrarea fiind nominalizată pentru Premiul Societății Scriitorilor Bistrița-Năsăud (2015), scrisă la împlinirea a 220 de ani de la nașterea poetului Vasile Fabian Bob Reu (Rău) (Anuarul Bârgăuan, 2017).

Din multitudinea de articole publicate în Anuarul Bârgăuan, am dori să ne oprim atenția asupra unora deosebit de sugestive și cu valențe sentimentale pentru Niculae Vršmaș și anume: *"Drumul Romanilor" din Pasul Bârgăului*, *Geologia, ca spațiu și timp de formare a "Țării Bârgaielor"* (*Scurtă istorie geologică a Țării Bârgaielor și a regiunilor înconjurătoare*), *Călimanii, munții mei cei mai dragi*; *Pasul Borgo, vechea poartă a Transilvaniei*; *Colibița, paradisul din valea Bistriței*, articole care evocă deopotrivă pasiunea geologului pentru această meserie, pe care a desfășurat-o cu atâta implicare, dar și dragostea pentru locurile natale, în care și-a format personalitatea puternică de care este atât de mândru. Dragostea pentru cultură și locurile natale se materializează printr-o moștenire deosebită pe care o va lăsa comunității și anume "Casa Vršmaș - Bibliotecă și Muzeu", construită pe vatra părintească din Prundu Bârgăului.

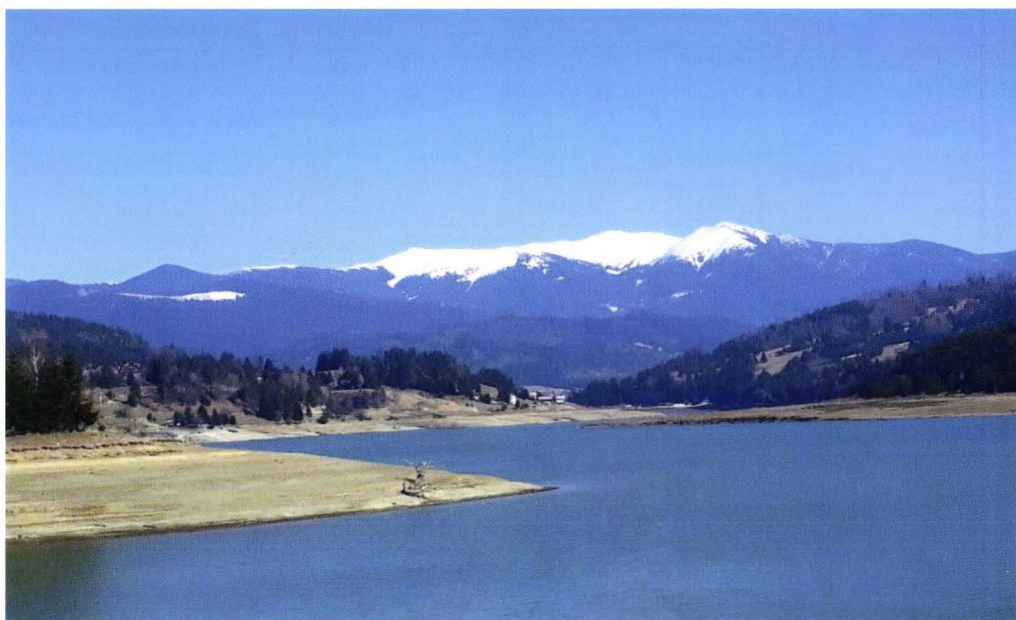


Fig. 7. Călimanii, "protectorii" Colibiței (foto C. Berkesy)

"Totul curge, totul se schimbă, nimic nu stă pe loc, spunea Heraclit. (...) Goana timpului ne face, adeseori, să nu remarcăm schimbările rapide care se petrec în jurul nostru, iar dacă, totuși, o facem, de cele mai multe ori memoria se supraîncarcă, iar noi le uităm surprinzător de repede (...). După un timp mai îndelungat, schimbările recente intră în viața noastră și le lasă în ceața vremii pe cele anterioare, multe fiind uitate doar după câteva generații". Am redat mai sus câteva argumente care întăresc motivația pe care o invocă domnul Niculae Vrăsmaș și care stă la baza unei activități febrile de cercetare, colectare a datelor și informațiilor și valorificare printr-o revistă a întregii mișcări culturale, științifice și chiar din alte domenii, ce se desfășoară în arealul Văii Bârgăului în timpurile noastre, dar și despre oameni și fapte din trecut (Anuarul Bârgăuan, 2014).

Niculae Vrăsmaș, deopotrivă geolog și literat, cu o activitate bogată și variată, desfășurată cu multă pasiune și devotament, a afirmat pentru redacția cotidianului *Răsunetul*, la aniversarea vârstei de 77 de ani: „Aș vrea să opresc timpul în loc, să nu mai îmbătrânesc. Pentru mine este cea mai frumoasă zi. Toată viața m-am luptat cu vrăjmașul din mine și mi-am dorit să fac doar lucruri frumoase. Promit că de acum nu voi mai număra anii”. Acum, la ceas aniversar noi toți îi dorim mulți ani frumoși, sănătate, inspirație pentru diverse alte proiecte de viitor.

BIBLIOGRAFIE:

Vrășmaș, N., 2017, Călimanii, munții mei cei mai dragi, în Anuarul Bârgăuan. Știință, Cultură, Arte și Literatură, Retrospective și perspective bârgăuane, Anul VII, Nr. 7, pag. 10-12, Editura Eikon, Cluj-Napoca.

***2014, Anuarul Bârgăuan. Știință, Cultură, Arte și Literatură, Bârgaiele între istorie și prezent, Anul IV, Nr. 4, Redactor fondator Nicolae Vrășmaș, Volum coordonat, îngrijit și prefațat de Nicolae Vrășmaș, Editura Eikon, Cluj-Napoca, pag. 205.

***2017, Anuarul Bârgăuan. Știință, Cultură, Arte și Literatură, Retrospective și perspective bârgăuane, Anul VII, Nr. 7, Redactor fondator Nicolae Vrășmaș, Volum coordonat, îngrijit și prefațat de Nicolae Vrășmaș, Editura Eikon, Cluj-Napoca, pag. 10-12, pag. 208-216.

<http://www.ziare.com/bistrita/stiri-life-show/poezia-sapientiala-a-lui-nicolae-vrasmas-7100181>, accesat în data de 18 noiembrie 2019.

<https://rasunetul.ro/ing-nicolae-vrasmas-un-impatimit-iubitor-al-plaiurilor-natale>, accesat în data de 18 noiembrie 2019.

<https://www.bjbn.ro/scriitori/82/Nicolae-Vrasmas.html>, accesat în data de 18 noiembrie 2019.

Asist. Univ. Dr. Lia-Maria CIOANCA
Cercet. Șt. III Dr. Ing. Marius HORGA

GEOLOGY

MINERALOGICAL-PETROGRAPHICAL STUDIES ON THE LATE BRONZE AGE CERAMICS FROM STUPINI ARCHAEOLOGICAL SITE (TRANSYLVANIA, ROMANIA)

Marius HORGA*

Abstract. The paper focuses on the study of Late Bronze Age ceramics (Noua culture) identified in the Stupini archaeological site area (Bistrița-Năsăud County, Romania). The mineralogical and petrographical methods used are the standard ones recommended in geoarchaeology and archaeometry studies.

The Late Bronze Age ceramics from Stupini can be classified as semifine and coarse ceramics. The following structural types were identified in the matrix: microcrystalline-amorphous, amorphous-microcrystalline, and amorphous. The ceramic texture points to manual modelling of the artefacts.

As raw materials, calcareous clay was used for obtaining the ceramic mass, the main binder being represented by ceramoclasts (83% of the samples), lithoclasts and crystalloclasts (river sand).

The ceramics from Stupini was obtained by using a classical technology consisting in collecting the clay from the subsoil level, wetting and tempering it, then mixing it with binders in order to achieve the desired plasticity. The kneading was performed manually, by mixing clay boulders. The relatively fast drying led to the occurrence of primary pores and of fine fissures. Next step was represented by incision and immersion in slurry in order to obtain smooth surfaces. The last stage was glazing.

The firing temperatures were between 850°-1000° C.

The raw materials used for obtaining the Stupini ceramics were most probably represented by kaolinitic-illitic calcareous clays, with local enrichment in iron oxides. The source was most probably local, in the vicinity of the archaeological site, within the Sarmatian deposits. The binders were represented by ground ceramic shards and sand from the neighbouring riverbed.

Key words: Late Bronze Age ceramics, Stupini site (Bistrița-Năsăud County, Romania), mineralogical-petrographical characterization, polarising microscopy, X-ray diffraction.

Introduction

The Bronze Age (Noua culture) ceramic material under study was collected from the area of the Stupini archaeological site (Fânațele Archiudului location, Gaiu, 1999, 2002) by archaeologist dr. Corneliu Gaiu. The ceramic material is currently inventorized in the collection of the Bistrița-Năsăud Museum Complex.

* Bistrița-Năsăud Museum Complex, 19 Gen. Gr. Bălan St., Bistrița,
e-mail: horgaro@yahoo.com

Geologically, the area where the Stupini archaeological site is located consists of Miocene (Sarmatian) and Quaternary sediments. The rocks are represented by clays, calcareous clays, sandstones, tuffs, sands and gravel (Răileanu et al., 1967).

Previously published geoarchaeology and archaeometry papers on ceramic materials ranging from Bronze Age to Middle Ages identified in other north-east Transylvanian sites Ghergari et al., 2003a,b; Ghergari et al., 2005, Ghergari et al., 2010, Ionescu et al., 2006a,b; Ionescu et al., 2007, Horga et Ghergari, 2010, Horga et Ghergari, 2011) were the result of the collaboration between researchers from the Bistrița County Museum and those from Babeș-Bolyai University in Cluj-Napoca.

Stupini site

The archeological site from Stupini is located in the southern part of Bistrița-Năsăud County, in the area where the springs of the Dipșa Valley are located (Fig. 1). The Bronze Age ceramics (Noua culture) that was studied was recovered from the Stupini archeological site (Fânațele Archiudului location).

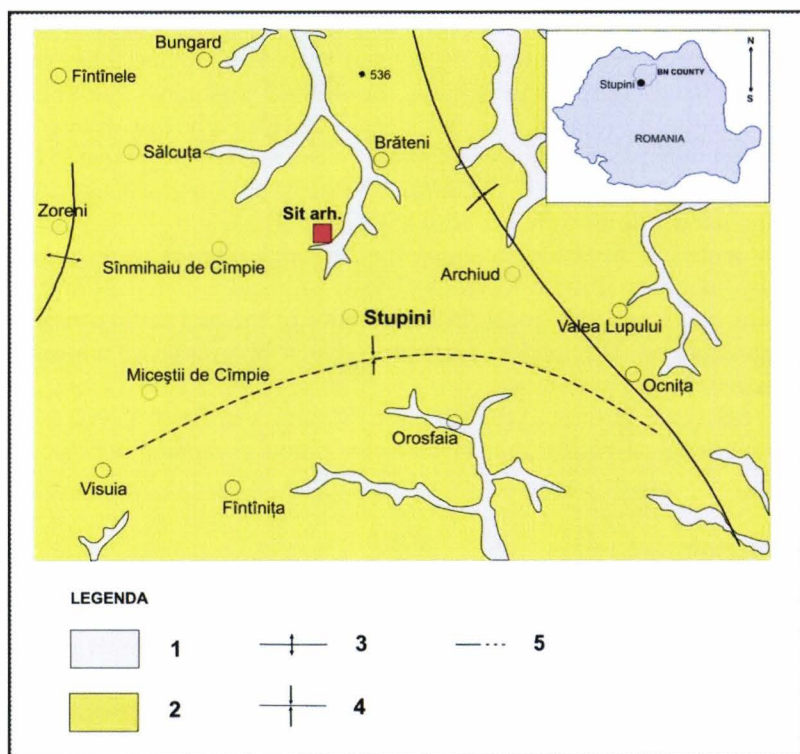


Fig. 1. Geological map of Stupini area with the location of the archeological site (Răileanu et al., 1967, modified). Legend: 1 – Quaternary deposits (gravels, sands); 2 – Neogene deposits (clays, calcareous clays, tuffs, sands, gravels, sandstones) (Popescu et al., 1995); 3 – Anticline axis; 4 – Syncline axis, 5 – Fault.

Samples and methods

Our study is based on the geoarchaeological and archeometrical investigation of six ceramic samples from Stupini. The samples were macroscopically observed under the binocular, their porosity was measured with a digital hydrostatic Mettler Toledo CB 203 scale based on the methodology described by Shepard (1976). Additional methods represented by transmission polarizing microscopy by a Jenapol microscope and X-ray diffraction by a Bruker D8 Advance diffractometer (CuK_α radiation $\lambda=1.54055\text{\AA}$ and C monochromator) were used.

Macroscopic investigation. Except for sample 277, the Bronze Age ceramic fragments from Stupini are not ornamented and were manually processed. They show various colors, from reddish to dark-grey. The thickness of the ceramic walls ranges between 0.7 and 1.1 cm. Based on their fineness degree, the studied fragments can be classified as coarse, and semifine (Fig. 2).



Fig. 2. Ceramic fragments from Stupini, under study:
a) Sample 274; b) Sample 275; c) Sample 277.

The cross-section of the coarse ceramics (samples 273-276) shows zoning from dark-grey to reddish in the external layer to grey in the inner layer. A significant ceramic component are the large ceramoclasts, sometimes larger than 2-3 mm (sample 275), as well as the spherical or elongated pores oriented parallel or in an angle to the ceramic wall.

The semifine ceramics (samples 277 and 278) also show zonation, with a reddish external layer and a greyish inner one. In sample 277 one can notice careless modelling resulting in the sample friability. In cross-section, this type of ceramics shows more-or-less elongated pores, while the ceramoclasts and lithoclasts show mainly arenitic sizes.

The fineness of ceramics has been defined based on microscopic observations, by determining the ratio of rudite, arenite, silt and lutite grain size fractions by using the micrometric net. The ternary plot of the granulometric

data shows that the Bronze Age ceramics from Stupini can be classified as semifine and coarse (Fig. 3).

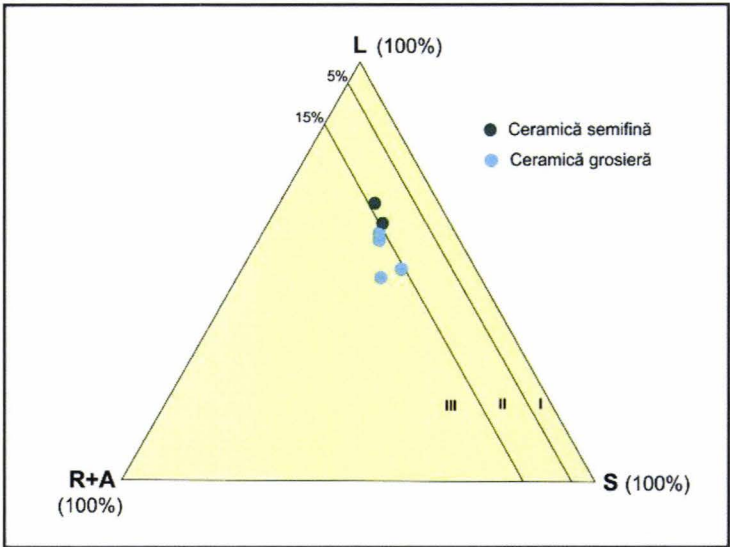


Fig. 3. Fineness degree of the Bronze Age ceramics from Stupini.
Ternary granulometric plot: R+A-L-S.

The apparent porosity measured on the ceramic samples from Stupini ranges between 18.7 and 37.9 % (Horga, 2008; table 1).

Table 1. Apparent porosity of the Bronze Age ceramics from Stupini

Semifine ceramics		Coarse ceramics	
Sample	Apparent porosity (%)	Sample	Apparent porosity (%)
277	37.93	273	28.25
278	32.07	274	25.13
		275	18.67
		276	28.35

Microscopic data

Semifine ceramics

The two semifine ceramics samples under study show an amorphous matrix throughout the whole thickness of the ceramic wall (Fig. 4). The orientation of the elongated elements (pores, micaceous minerals) points to the manual modelling of the studied ceramics.

The binder embedded in the matrix consists of lithoclasts (andesite, diorite, porphyric granodiorite, gneiss, schists, quartzite, sandstone), ceramoclasts and

crystalloclasts: quartz, feldspars (plagioclases and orthoclase), muscovite in both samples, and Fe-depleted biotite, oxyhornblende, pyroxenes, garnets.

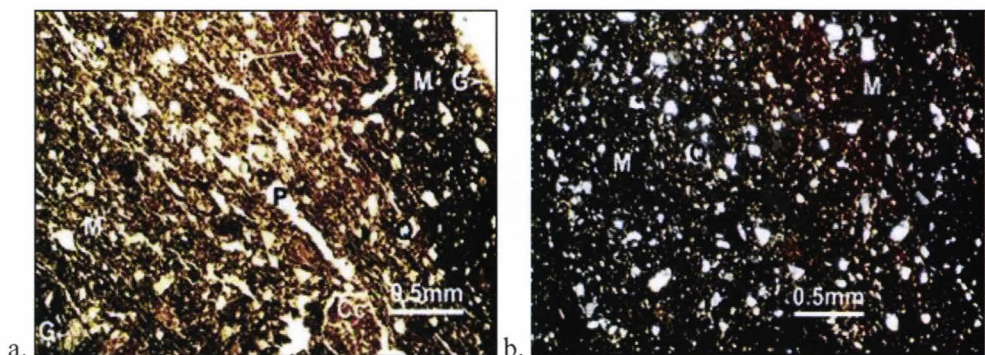


Fig. 4. Microscopic image in polarised light. Semifine ceramics from Stupini (Sample 278). The structure of the matrix (M) is amorphous and the texture is oriented. The matrix embeds small crystalloclasts of quartz (Q), feldspars and garnet (G). Numerous primary, elongated pores are present (P). The glaze is visible at the border of the ceramic wall (G). a) – 1N; b) – N+.

Coarse ceramics

The matrix of the coarse ceramics in the three investigated samples does not show a homogeneous structure along the whole thickness of the wall. The structural succession is as follows: amorphous-microcrystalline in the centre and microcrystalline-amorphous on the border, and respectively microcrystalline and microcrystalline-amorphous in the centre and on one side, while the other side is microcrystalline. A single sample represents an exception, showing an amorphous-microcrystalline structure gradually passing to an amorphous one towards the border, across the whole thickness of the wall. The texture is breccious, due to the presence of numerous ceramoclasts introduced in the clay mass as binder; there are also areas with slightly-porous aspects due to the presence of primary elongated pores and of secondary ones, represented by contraction and decomposition fissures (Fig. 5). The inclusions in the matrix are represented by lithoclasts (Fig. 6), ceramoclasts of sizes less than 3.5 mm and crystalloclasts (quartz, feldspars - plagioclases and orthoclase, muscovite, Fe-depleted biotite – in all the samples; pyroxenes, garnets, zircon, tourmaline and thermally-affected calcite are present only in a few samples).

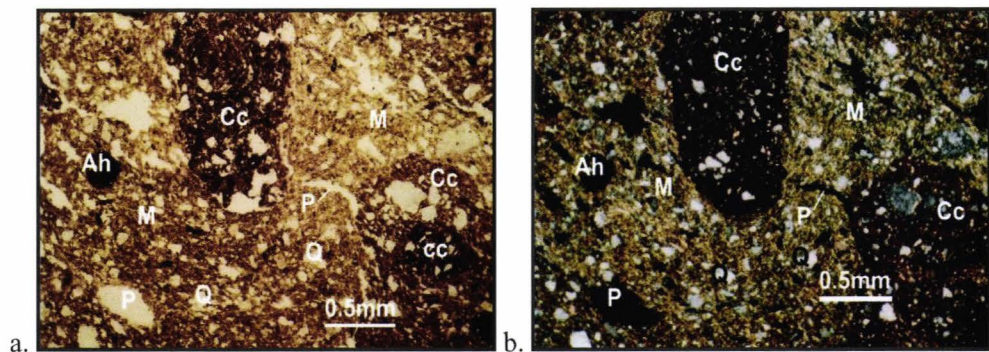


Fig. 5. Coarse ceramics from Stupini (Sample 273). The matrix (M) shows microcrystalline-amorphous structure in the external layer and amorphous-microcrystalline one in the centre of the shard. The texture is not oriented. The matrix embeds ceramoclasts (Cc), hematitic aggregates (Ah) and crystalloclasts: quartz (Q). Numerous primary, elongated pores are visible (P). a) – 1N; b) – N+.

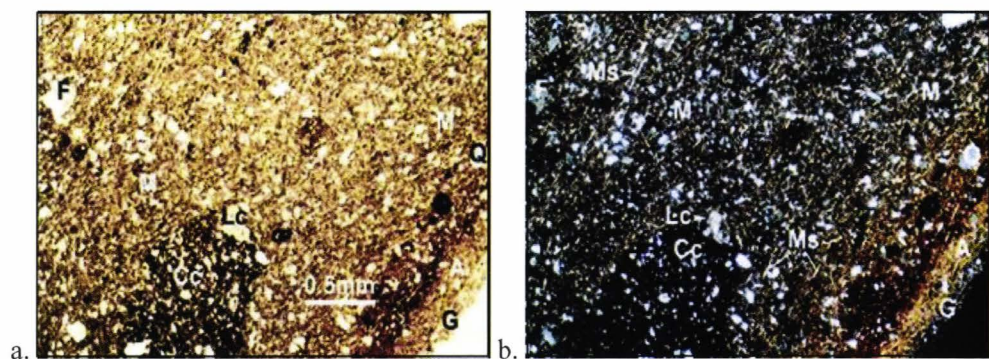


Fig. 6. Coarse ceramics from Stupini (Sample 274). The structure of the matrix (M) is amorphous-microcrystalline and the texture is oriented. The matrix embeds lithoclasts (Lc – quartzo-feldspatic aggregates), ceramoclasts (Cc) and crystalloclasts: feldspars (F), quartz (Q), muscovite (Ms). The ceramic wall is covered by adobe (A) and glaze (G). a) – 1N; b) – N+.

X-ray diffraction patterns (Fig. 7) evidenced the following minerals: quartz (dominant) and small amounts of: feldspar, micas and calcite. The clay minerals forming the matrix have collapsed (kaolinite) or destructured in various degrees (illite and possibly smectite). Among the neoformed minerals it is worthy to mention the presence of hematite and gehlenite.

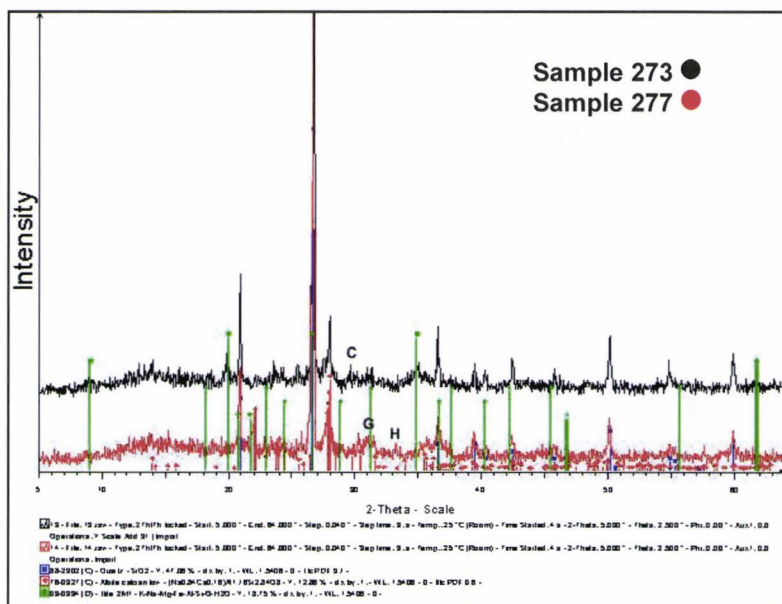


Fig. 7. X-ray diffraction patterns on Bronze Age ceramics from Stupini.
C – calcite; G – gehlenite; H – hematite

Firing temperatures. The microscopic and diffractometric data point to firing temperatures of 950°-1000°C in sample 277, of 900 °-950 °C in samples 278 and 274, and of 850 °-900 °C in the other coarse ceramic samples.

Conclusions

The Late Bronze Age ceramics from Stupini (Noua culture) may be assigned to two fineness classes: semifine and coarse. In relative amounts, semifine ceramics is subordinate (33 %), while the coarse one is dominant (67 % of the total number of samples).

The matrix of the ceramics shows the following structural types: microcrystalline-amorphous, amorphous-microcrystalline and amorphous. The texture points to manual processing of the ceramics.

The clay used for obtaining the ceramic mass was a calcareous one, as proven by the formation of gehlenite (a reaction product) and by the presence of thermally-affected calcite. The phyllosilicate structures (micas and clay minerals) are destructured and partly collapsed in the ceramics.

The typical binder material used during the Bronze Age was represented by ceramoclasts. At Stupini, 83% of the samples contain ceramoclasts as binder, accompanied by lithoclasts and crystalloclasts (river sands).

The ceramics of the Late Bronze Age from Stupini were obtained by applying a classical technology. The calcareous clay collected close to the soil

layer (as indicated by the presence of pedogenetic ferruginous concretions) was mixed with water and then knead; according to the needed plasticity, corresponding amounts of binding materials were then added. The forming was done manually, from clay boulders, this being supported by the wide range of textures (chaotic orientations within the ceramic shard, parallel to the wall due to the pressing with the fingers-palms, movement of the ceramic mass by pulling movements thus leading to diagonal orientations etc). The relatively fast drying favoured the formation of primary pores and of fine fissures. After drying, the ceramics was incised, then the vessels were sunk into slurry for smoothing the surfaces; the last stage was represented by glazing.

The firing temperature in the oven was 850° - 1000°C.

In the case of the ceramics from Stupini, calcareous kaolinitic-illitic clays – some of them rich in iron oxy-hydroxides, cropping out within Sarmatian formations close to the site were used as raw materials for the ceramic mass, while the binding materials were represented by ground ceramic rests and river sand from the neighbouring riverbed.

Rezumat. Lucrarea aduce în prim plan studiul ceramicii de epoca bronzului târziu (cultura Noua), descoperită în zona sitului arheologic Stupini (județul Bistrița-Năsăud, România), prin intermediul tehnicilor mineralogice și petrografice de analiză corespunzătoare geoarheologiei și arheometriei.

Ceramica de epoca bronzului târziu de la Stupini se încadrează claselor de finețe semifină și grosieră. Matricea ceramicii prezintă următoarele tipuri de structuri: microcristalin-amorfă, amorfo-microcristalină și amorfă. Textura ceramicii demonstrează modelarea manuală a vaselor.

La obținerea masei ceramice argila utilizată este una calcaroasă (intuită pe baza prezenței gehlenitului ca produs de reacție și a calcitului afectat termic). Degresantul dominant este reprezentat de ceramoclaste (83% din probe), alături de litoclaste și cristaloclaste (nisip de râu).

Ceramica de la Stupini a fost obținută printr-o tehnică de procesare clasică, în care argila calcaroasă, colectată din apropierea solului, a fost înmuiată în apă, apoi frământată, adăugându-se cantitatea necesară de degresant pentru reglarea plasticității. Modelarea s-a făcut manual, din bulgări de argilă, iar uscarea relativ rapidă a condus la apariția porilor primari și a unor fisuri fine. A urmat incizarea și scufundarea vaselor într-o barbotină pentru netezirea suprafețelor, iar la final glazurarea.

Ceramica a fost arsă în cuptor la temperaturi cuprinse între 850°-1000°C.

Pentru ceramica de la Stupini, s-au utilizat ca materii prime cel mai probabil argile calcaroase caolinitice-illitice, la unele probe bogate în oxizi de fier, care își găsesc proveniența în surse aflate în apropierea sitului arheologic, la nivelul formațiunilor sarmațiene, degresantul fiind reprezentat de cioburi pisate și nisip adus din albia pârâului.

REFERENCES:

- GAIU, C., 1999, Așezarea daco-romană de la Stupini (Jud. Bistrița-Năsăud). În: Napoca 1880 de ani de la începutul vieții urbane, Cluj-Napoca, p. 84-96.
- GAIU, C., 2002, Așezarea din sec. V-VI p.Chr. de la Stupini „Vătaștină”. Revista Bistriței, XVI, Ed. Accent, Cluj-Napoca, p. 113-158.
- GHERGARI, L., IONESCU, C., HORGĂ, M., 2003a, Mineralogia artefactelor ceramice din situl arheologic Ilișua (Jud. Bistrița-Năsăud). St. Cerc. Geol. Geogr., 8, Ed. Supergraph, Bistrița, p. 129-137.
- GHERGARI, L., IONESCU, C., HORGĂ, M., 2003b, Ceramica epocii bronzului din situl arheologic Ilișua-caracteristici geoarheologice. Simp. GEO 2003, Abstr. vol., Cluj-Napoca, p. 23-24.
- GHERGARI, L., IONESCU, C., HORGĂ, M., RĂDULESCU, G., 2005, Studii mineralogice-petrografice asupra ceramicii medievale timpurii de la Șieu-Odorhei (jud. Bistrița-Năsăud). Arheologia medievală, V, Cluj-Napoca, p. 171-190.
- GHERGARI, L., RĂDULESCU, G., HORGĂ, M., 2010, Ceramica medievală timpurie de la Vermeș (județul Bistrița-Năsăud) – studii mineralogice petrografice. Vasaria medievală II, Ed. Accent, Bistrița, p. 108-124.
- HORGĂ, M., 2008, Studii geoarheologice asupra ceramicii și a materialului litic din situri localizate în județul Bistrița-Năsăud”, Teză de doctorat, Univ. Babeș-Bolyai, Cluj-Napoca, 209 p.
- HORGĂ, M., GHERGARI, L., 2010, Ceramica Latène din situl Ilișua – caracteristici geoarheologice și arheometrice. Revista Bistriței XXIV, Ed. Accent, Bistrița, p. 457-470.
- HORGĂ, M., GHERGARI, L., 2011, Studii mineralogice-petrografice asupra ceramicii Hallstatt de la Stupini (Jud. Bistrița-Năsăud). Revista Bistriței XXV, Ed. Accent, Bistrița, p. 350-357.
- IONESCU, C., GHERGARI, L., HOECK, V., SIMON, V., HORGĂ, M., 2006a, Thermal alteration of mineral phases in Bronze Age ceramics from Transylvania (Romania), 3rd Mid-European Clay Conference, Abstracts Book, p. 58, Opatija, Croatia.
- IONESCU, C., GHERGARI, L., HOECK, V., SIMON, V., HORGĂ, M., 2006b, Thermal transformations of mineral phases in ancient ceramics: a case study from Bronze Age in Transylvania (Romania). Ses. Comunic. Depart. Geol. UBB Cluj-Napoca, Dec. 2006, 23-24.
- IONESCU, C., GHERGARI, L., HORGĂ, M., RĂDULESCU, G., 2007, Early medieval ceramics from the Viile Tecii archaeological site (Romania): an optical and XRD study. Studia Univ. Babeș-Bolyai, Geologia, 2007, 52 (2), Cluj-Napoca, p. 29-35.
- POPESCU, Gh., MĂRUNȚEANU, M., FILIPESCU, S., 1995, Neogene from Transylvania Depression (Guide to Excursion A₁ (pre-Congress), Xth RCMNS Congress. Rom. Jour. Stratigr. 76, Suppl. 3, București, p. 1-27.
- RĂILEANU, Gr., RĂDULESCU, D., MARINESCU, Fl., PELTZ, S., 1967, Harta geologică a României, scara 1: 200000, L – 35 – VII, Foaia 11. Bistrița. Comitetul de stat al geologiei, Institutul Geologic, București.
- SHEPARD, O.A., 1976, Ceramics for the archaeologist. Carnegie Institute, Washington, 414 p.

GEOGRAPHY

TOURISTIC MANAGEMENT OF RURAL NATURAL HERITAGE FROM SOUTHERN DOBROGEA

Marius POPESCU*

Abstract. Situated between the Danube and the Black Sea Coast, Southern Dobrogea is a multicultural geographic region, full of nature and history. Geographical position and natural conditions of the environment are factors which determining variety of landscapes. Also, this region has a diverse natural heritage in the rural area. The aim of this paper is to identify components of natural heritage as touristic resources, and opportunities of its valorization for rural tourism. A complex geographic analysis of the natural heritage and management of this, it can contribute to develop of sustainable tourism in rural area from Southern Dobrogea.

Key words: Dobrogea, landscape, nature, rural, sustainability, tourism.

Introduction

Southern Dobrogea is a tableland unit located in South-Eastern part of Romania, between the Danube and the Black Sea Coast, and it's a territorial system well-outlined. The territorial system results from the interrelations established between natural environment and other artificial environments (economic, built, social, psychologic), having a physiognomy and functionality closely dependent on the intensity and the forms it takes (Ianoș, 2000). In this territorial system are distinguished the natural macro-system and the socio-economic macro-system. The character of uniqueness and originality by components of the natural macro-system (*relief, water, climate, vegetation, fauna*) is the support for touristic valorization (Ionașcu, 2011) of the natural heritage.

The geographical analysis of this territorial system is essential in defining the type of regional development, which considers the achievement of socio-economic and cultural finalities (Drăguț, 2000), such as rural tourism. The integrity and cohesion of the territorial system can be assessed by inter-conditioning its *environment-society-economy-infrastructure* components (Claval, 2005). The environmental component should be analyzed from the perspective of relationship with other territorial resources, through scenarios of sustainable development for the population and its socio-economic activities (Drăguț, 2000), which also have an essential role in the process of touristic development in this rural area.

Natural heritage is a resource for recreational tourism, knowledge tourism, and preservation of biodiversity (Pătru-Stupariu, 2011).

*Transilvania University of Brașov, Faculty of Food and Tourism, 148 Castelului Str., 500014 Brașov, email: popescu.marius@unitbv.ro

In rural areas, living human communities with old traditions (Bordânc, 2008), which makes it necessary to protect local identity and culture for the development of tourism to be beneficial for these populations.

The purpose of this paper is to analyze the natural heritage from Southern Dobrogea, and the opportunities of tourism development for the socio-economic sustainability and efficiency of local rural communities.

Methodological aspects

In order to identify main aspects of the natural heritage from Southern Dobrogea, the research methodology is represented by bibliographic and cartographic documentation, as well as field research. The natural heritage components can be integrated as touristic resources (Daugstad, 2007), on traditional touristic routes, or in different rural touristic circuits.

For the evaluation of the natural heritage resources in rural administrative units (*ATUs*) of Southern Dobrogea territorial system, the multi-criteria analysis method (Bobancu, 2014) has been applied, which has the following steps:

- **Establishing Criteria.** For the assessment of *Natural Heritage Indicator* (I_{NH}) were selected 7 criteria: *geomorphologic elements* (C_1), *bioclimatic factors* (C_2), *hydrographic elements* (C_3), *vegetation* (C_4), *fauna* (C_5), *protected areas* (C_6), *natural landscape* (C_7);

- **Determining the weight of each criterion**, by calculating weighting coefficients with the formula: $\gamma_i = (p + \Delta p + m + 0,5) / (-\Delta p' + N_{crit}/2)$ (Bobancu, 2014);

- **Identification of all variants**, which are represented by 45 *ATUs* in the studied area;

- **Granting a note N.** For each criterion, notes are given from 5 to 1, depending on the potential of natural heritage: *very high* (5), *high* (4), *medium* (3), *low* (2), *insignificant* (1);

- **Calculation of the product between notes (N) and weighting coefficients** (γ_i), for determination of the *ATUs* hierarchy according to the value of natural heritage.

Depending on the potential of natural heritage, the *ATUs* hierarchy was established, in order to correlate it with other resources, for the purpose of its touristic use.

Mapping of geographical aspects of natural and cultural heritage (Tofan, 2013), using an open-source GIS software (Urdea, 2008), it has an important role in the diagnosis and prognosis of sustainable rural tourism (Gruia, 2017) in the Southern Dobrogea territorial system.

Research Results

The geographical analysis of natural heritage

Southern Dobrogea is a tableland unit in South-Eastern part of Romania situated between the Danube and the Black Sea Coast. It's a typical platform, located to South of the Camena-Topalu fault line, and bordered by the Black Sea and the Danube. To the East and West, boundaries have a morphostructural character, following the Danube and the Black Sea shore. Characteristic of this area, suspended between two basic low levels, Danube to West, and Black Sea to East, is the fact that here is a vast endoreic area. From a geological point of view, the area overlaps completely with the Moesian Platform, covered by formations deposited in several sedimentation cycles. The petrographic substrate, composed predominantly loessoid deposits (90%), followed by limestone, sandstone, conglomerate, sands, gravel and clays.

The altitude of area has an average of 75-100 m, the lowest plateau in Romania (Fig. 1). It is said that the region is tabular and smooth as a plain, but it has different orientation, slopes and fragmentation, and even altitude falls, which led to the shaping of several genetic types of relief. The fluvial relief is represented by valleys of different sizes and shapes, that are oriented towards the Black Sea or the Danube, through lakes. They have an elusive appearance, they get deeper, and the slopes have slopes up to the vertical as it approaches the spill. The slopes are affected by either fluvial erosion or the lake abrasion, and shaped to form terraces. The bottom of the valleys is very smooth, and proluvial-colluvial deposits occur in their course, causing some marshes and lakes. The karst relief is represented by valleys, dolines, caves and swallow-holes, which are too broad in relation to the extension of limestone. The fields are wide, without drainage, the dolines are small, often confused with bowls, the caves are few in number, short, without concretions, often covered with dust resulting from limestone alteration in the arid climate. The relief with lakes appears in landscape encountered by cliffs around shore along the Danube (Fig. 1), intensely eroded by action of lake abrasion or reduced as surface under the anthropogenic influence. The relief on sands is characteristic to seaside, and along to the Danube. Sand dunes were formed by wind action. The dunes have irregular forms, oval shape and height about 3 m. Along the Danube these dunes are covered of crops (Iordan et Dobre, 2005).

Concerning climate perspective, the region is under the influence of the Mediterranean and Pontic cyclones, as well as the Euro-Asian continental anticyclones. As a result, the climate is temperate-continental, with submediterranean influences in South-West, continental semi-dry in rest of area, and moderate to the Danube and the Black Sea Coast. The specific character of climate of the region is climatic level of plain, with an average annual temperature of 11.0°C at the Danube, in West, and less than 11.0°C in the central part. In the warm season, the average temperatures are higher in

peripheral areas, due to Pontic and Danubian influences, compared to the central ones due to continental influences. The maximum air temperature can rise to over 38.0°C to the seashore, and 42.0°C to the Danube, highlighting the role of the nearby water areas, where the frequency of the clear sky and sunshine is higher. Rainfall decreases from West to East from about 450 mm to less than 400 mm, slightly higher in the higher areas of the region. The predominant wind is from North in the Western part of the plateau, and from North-West in the Eastern part. The most important climatic feature is the phenomenon of drought and dryness, all year due to “heat dam” on the water surfaces, the high thermal contrasts between water and land, and the high frequency of marine and Danube breezes, that cancel the effect of thermal convection or invasions of hot tropical-continental air (Iordan et Dobre, 2005).

The hydrographic network is represented by the groundwaters present in different geological deposits, but also by a series of surface hydrographic organisms, typical of their intermittent drainage regime to the Danube or the Black Sea, and some fluvial or maritime lakes (Fig. 1).

The predominant vegetation is steppe, but in South-West area being forests (Fig. 3) with diverse floral composition. Steppe vegetation is found on small areas and is highly degraded by excessive grazing, but most of the land has been replaced by agricultural crops. The forests are extended in the South-West, in the highest part of the plateau (Iordan et Dobre, 2005).

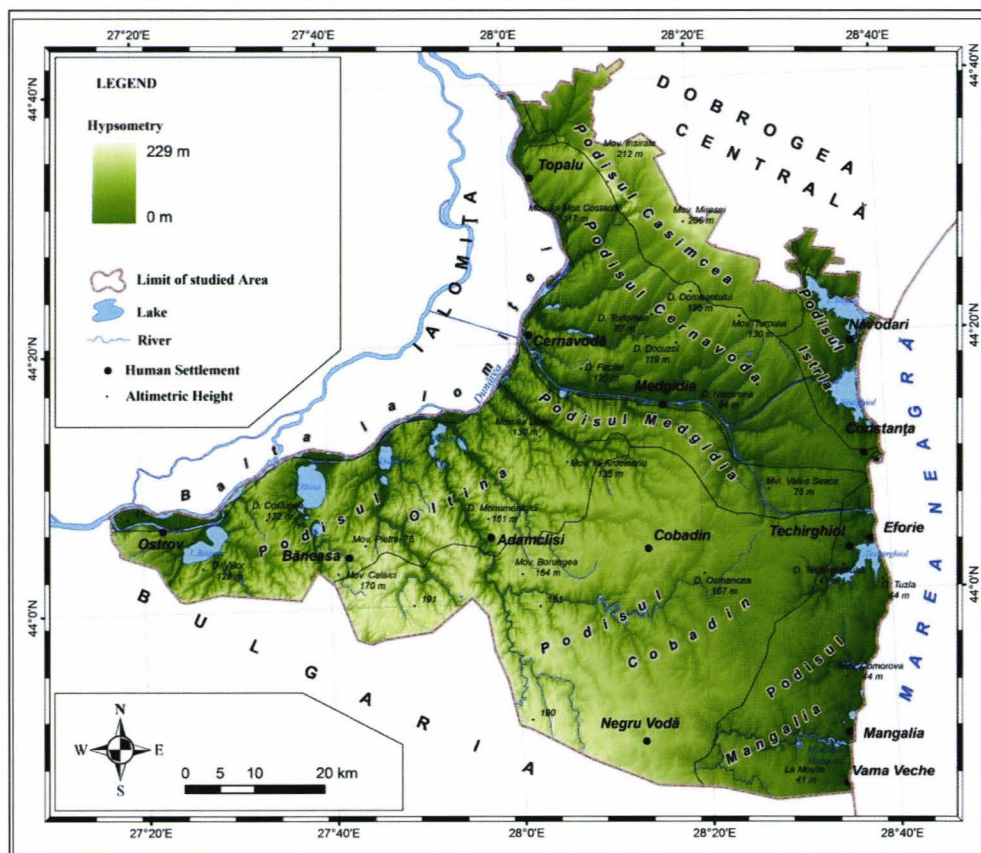
The particularities of flora and fauna, special landforms, stratigraphic fossils (some with unique value), as well as interesting caves, required declaration of some natural protected areas (Fig. 3): *zoological areas* (*Techirghiol lake, Agigea lake*), *botanical areas* (*Marine Dunes from Agigea, Valu lui Traian forest*), *geological, paleontological or speological areas* (*Limestone Walls from Petroșani, Neo-Jurassic Reef of Topalu, fossil points from Aliman, Cernavodă, Movila Banului, and Obanu Mare - La Movile cave*), *mixed protected areas* (*Coastal Marine Aquatorium 2 Mai-Vama Veche, Alah-Bair Hill, forests - Canaraua Fetii, Dumbrăveni, Esechioi, Fântânița-Murfatlar, Hagieni, lakes - Oltina, Vederoasa, Bugeac, Dunăreni, Mangalia swamp*) (Popescu, 2015).

Touristic evaluation of natural heritage resources

By applying the multi-criterion analysis method (Bobancu, 2014), for evaluating the potential of natural heritage at every *ATUs* level from Southern Dobrogea territorial system, the table 1 presents the share of each component-criterion of this indicator, and result of the weighting coefficient.

Table 1. Determining the weight of each criterion

Criterion	C_1	C_2	C_3	C_4	C_5	C_6	C_7	Points	Level	γ_i
C_1	$\frac{1}{2}$	1	$\frac{1}{2}$	1	1	$\frac{1}{2}$	$\frac{1}{2}$	5	2	3.50
C_2	0	$\frac{1}{2}$	$\frac{1}{2}$	1	1	0	0	3	5	1.17
C_3	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	3.5	4	1.64
C_4	0	0	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	0	2	6	0.58
C_5	0	0	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	0	0	1.5	7	0.27
C_6	$\frac{1}{2}$	1	$\frac{1}{2}$	$\frac{1}{2}$	1	$\frac{1}{2}$	0	4	3	2.20
C_7	$\frac{1}{2}$	1	$\frac{1}{2}$	1	1	1	$\frac{1}{2}$	5.5	1	4.58



Source: own figure

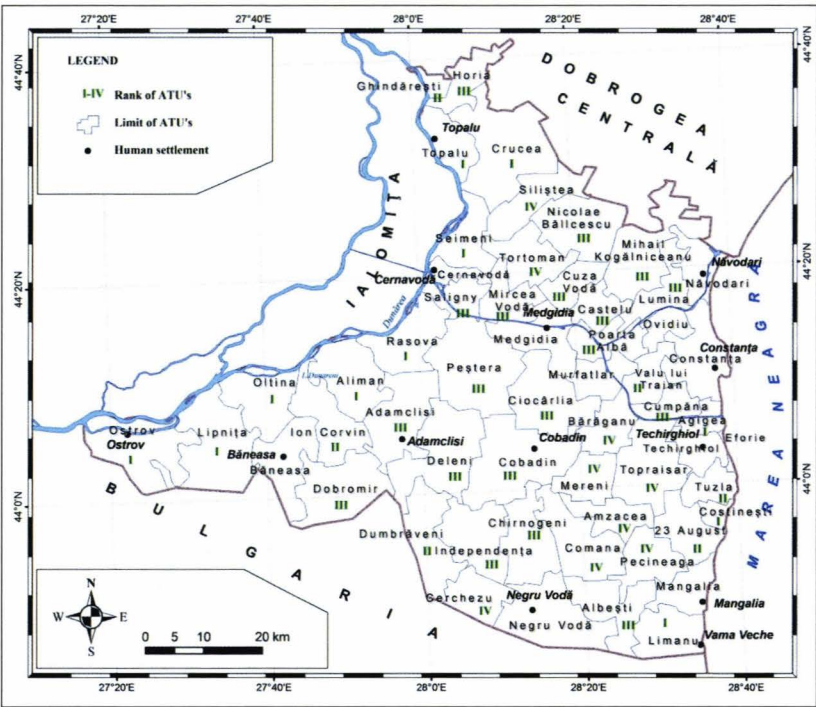
Fig. 1. Physical-geographic map of Southern Dobrogea Territorial System

By multiplying the value of the weighting coefficient for each criterion, with the note given to each criterion at the level of *ATUs*, values have been obtained that put each *ATUs* in a category. The highest values correspond to a high potential of natural heritage (Rank I), and the lowest correspond to a low potential of natural heritage (Rank IV). The highest values (more than 85% of maximum value) correspond to *ATUs* along Danube (*Ostrov*, *Oltina*, *Seimeni*, *Topalu*, *Aliman*,

Lipnita, Rasova), or on the Black Sea Coast (*Limanu, Agigea, Costinești*) (Fig. 2). There are also several *ATUs* of the Rank II (*Valu lui Traian, Ion Corvin, Dumbrăveni*) or the Rank III (*Deleni, Cobadin, Albești, Adamclisi, Chirnogeni*), from the central part of studied region (Fig. 2). Depending on resources of the natural heritage, the 45 *ATUs* from Southern Dobrogea are ranked as follows: 11 - the Rank I, 6 - the Rank II, 19 - the Rank III, 9 - the Rank IV (Tab. 2, Fig. 2).

Table 2. The hierarchy of *ATUs* according to potential of natural heritage

Rank	Value	ATUs
I(11)	≥60.00	<i>Ostrov, Limanu, Oltina, Seimeni, Topalu, Aliman, Lipnița, Agigea, Costinești, Crucea, Rasova</i>
II(6)	59.99-50.00	<i>Ghindărești, Valu lui Traian, Ion Corvin, 23 August, Tuzla, Dumbrăveni</i>
III(19)	49.99-40.00	<i>Deleni, Cobadin, Albești, Castelu, Adamclisi, Cumpăna, Saligny, Poarta Albă, Lumina, Mihail Kogălniceanu, Mircea Vodă, Nicolae Bălcescu, Peștera, Chirnogeni, Cuza Vodă, Dobromir, Horia, Independența, Ciocârlia</i>
IV(9)	<40.00	<i>Siliștea, Topraisar, Tortoman, Pecineaga, Mereni, Amzacea, Comana, Bărgănu, Cerchezu</i>



Source: own figure

Fig. 2. Southern Dobrogea: Hierarchy of *ATUs* according to potential of Natural Heritage

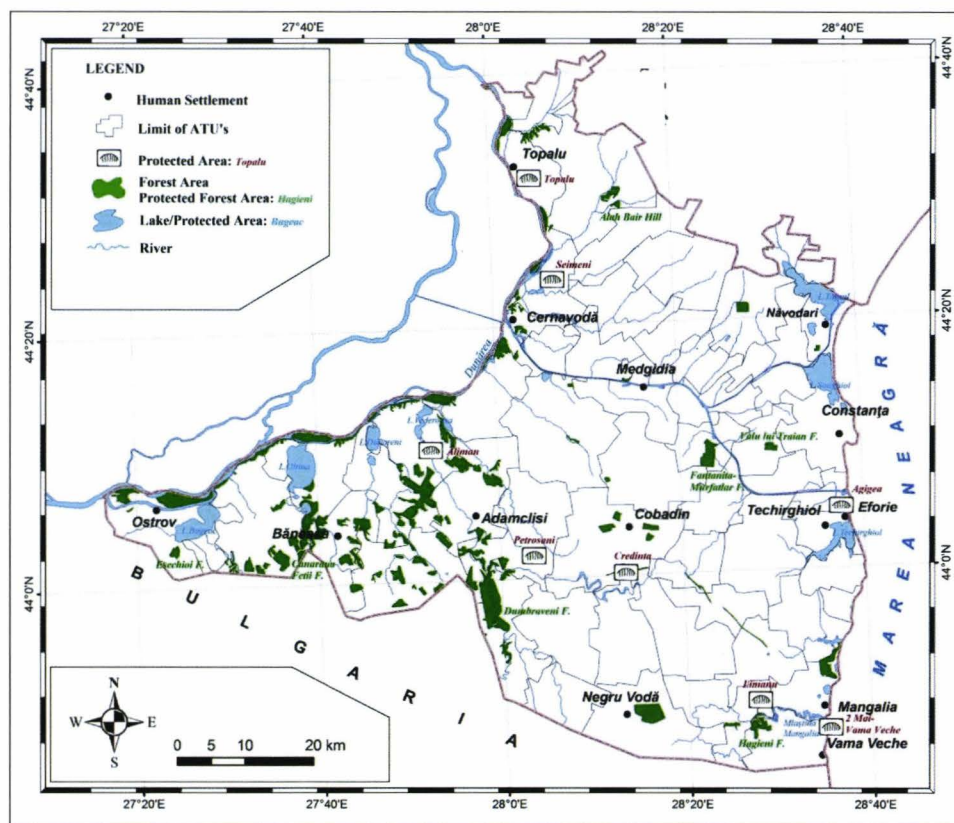
Touristic valorization of the rural natural heritage

Currently, the rural tourism has a fast development, attracting tourists with respect for nature, and local culture. It is based on resources of natural heritage, offering distinctive touristic products, such as ecotourism or cultural tourism, in regions with remarkable biodiversity, and local communities that have kept their habits and traditions unaltered.

Rural tourism contributes to supporting the development of traditional rural economy and the maintenance of social and cultural-historical traditions of local communities (Popescu and Urdea, 2012).

The Southern Dobrogea territorial system has a high and diversified touristic potential of the natural heritage (wetland of the Danube, marine bioclimate, lakes, forests, protected areas, diverse landscapes), especially in ATUs located on the Black Sea Coast (in the East), or along the Danube (in the West), and less in the rest part of area.

Figure 3 shows the territorial distribution of main resources with touristic value of the natural heritage within Southern Dobrogea.



Source: own figure

Fig. 3. Touristic resources of Natural Heritage from Southern Dobrogea

By association of the natural heritage resources with other resources from Southern Dobrogea, several touristic routes are proposed.

On touristic routes highlighted in figure 4, can be visited resources of the rural natural heritage, as well as other touristic resources (cultural sights, seaside resorts, recreational areas for fishing, or water sports):

1. Touristic Trail Ostrov - Ion Corvin - Rasova - Seimeni - Topalu - Crucea: *Wetland of the Danube*, Bugeac lake (1,434 ha), Oltina lake (2,290 ha), Bratca and Cetate forests, Dunăreni lake (704 ha), Aliman fossil point (11 ha), Vederoasa lake (517 ha), Cernavodă fossil point (3 ha), Movila Banului fossil point (11 ha), Capidava avifaunistic area, Neo-Jurassic Reef of Topalu (21 ha), Alah-Bair Hill protected area (10 ha);

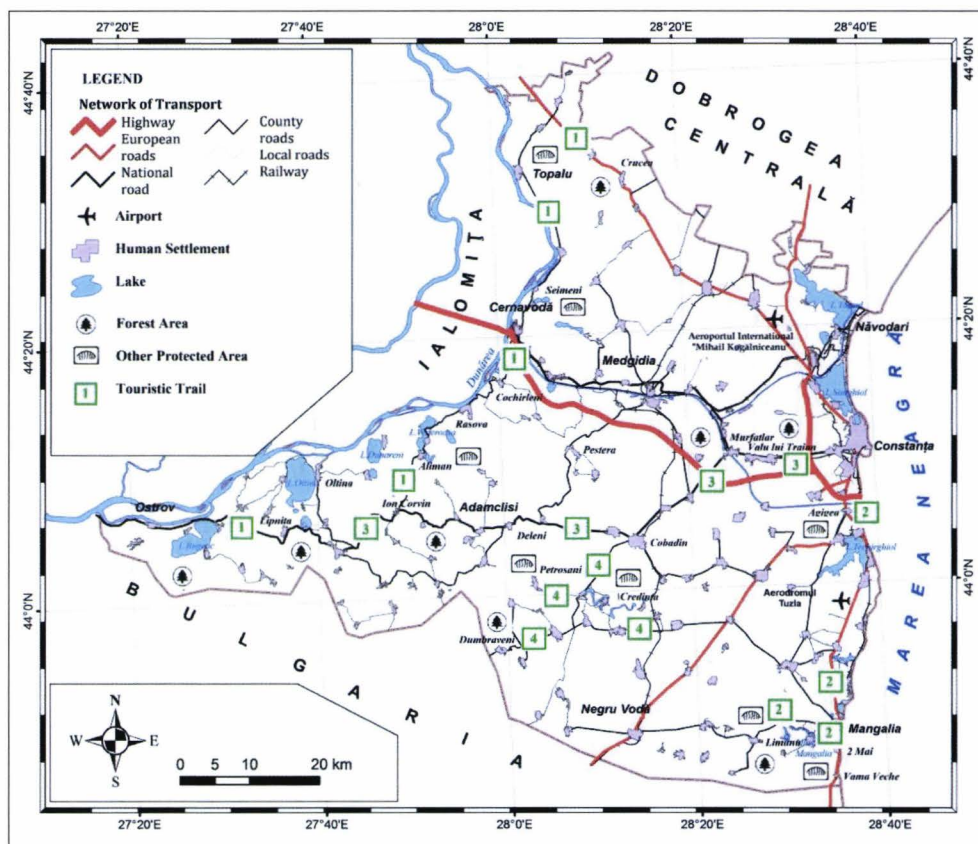
2. Touristic Trail Constanța - Agigea - 23 August - Limanu - Vama Veche: *Marine Dunes of Agigea* botanical area (8 ha), Techirghiol lake (1,230 ha), Neptun-Comorova forest, seaside resort with beaches and marine bio-climate, Mangalia swamp (98 ha), Hagieni forest (432 ha, which 207 ha scientific area), Coastal Marine Aquatorium of 2 Mai-Vama Veche (scientific and research zone - 5,000 ha), Obanul Mare - "La Mobile" Cave (12 ha).

3. Touristic Trail Constanța - Murfatlar - Cobadin - Adamclisi - Ion Corvin - Ostrov: *Valu lui Traian* botanical area (5ha), Fântânița-Murfatlar forest (83 ha, which 67 ha scientific zone), forests from Adamclisi-Ion Corvin-Băneasa area, Canaraua Fetiilor forest (172 ha), Esecioi forest (28 ha), Bratca-Cetate forests, Oltina lake (2,290 ha), Bugeac lake (1,434 ha), *Wetland of the Danube*;

4. Touristic Trail Cobadin - Independența - Dumbrăveni, with ramifications to Petroșani and Credița: *Limestone Walls from Petroșani* geological area (8 ha), Credița fossil point (10 ha), Dumbrăveni forest (316 ha).

Touristic management of natural heritage involves several *actions*, such as:

- *organizing in villages along main routes Centers of Touristic Information*;
- *arranging the infrastructure* for accommodation, food, sports and leisure in accordance with specifics of local resources, principles of touristic planning, and development standard indicators;
- *planning touristic routes for cycling or hiking*;
- *restoring landscapes and sights* with risk of degradation;
- *clear signaling of touristic routes, facilities and utilities*.



Source: own figure

Fig. 4. Touristic Trails in Southern Dobrogea

Conclusions

The Southern Dobrogea territorial system has a diversified natural heritage, which offers the support of rural development, through tourism.

Due to its complexity, the geographic analysis of natural and cultural heritage from Southern Dobrogea is an important factor for the sustainable development of this territory.

By capitalizing on the touristic potential of natural heritage, are created optimum conditions for touristic consumption, recreation and education, given the protection of biodiversity, preservation of landscapes, and the authentic way of living for local community.

Rural tourism is an important socio-economic activity of the Southern Dobrogea territorial system. The infrastructure needs to be modernized, and adapted to touristic demand. Also, rural tourism should be promoted, as an alternative to seasonal tourism.

Touristic management of natural heritage is an important factor to contribute with other cultural and agro-touristic resources to the development of a sustainable polyvalent rural tourism in Southern Dobrogea.

Rezumat. Dobrogea de Sud este o unitate de podiș situată în sud-estul României între Dunăre și Marea Neagră și constituie un sistem teritorial bine evidențiat. Scopul acestei lucrări este reprezentat de o analiză diagnostică a patrimoniului natural al sistemului teritorial Dobrogea de Sud și de a prezenta oportunități de valorificare turistică, în vederea sustenabilității și eficientizării socio-economice a comunităților locale din spațiul rural. În vederea identificării principalelor aspecte ale patrimoniului natural din Dobrogea de Sud, metodologia cercetării este reprezentată de documentare bibliografică și cartografică, precum și cercetare de teren. Componentele patrimoniului natural pot fi integrate ca resurse turistice, pe trasee tradiționale sau în diferite circuite cu profil turistic rural. Pentru evaluarea resurselor patrimoniului natural din unitățile administrative rurale (*UAT_{rurale}*) ale sistemului teritorial Dobrogea de Sud a fost aplicată metoda analizei multicriteriale. Prin aplicarea acestei metode, în funcție de valoarea turistică a resurselor patrimoniului natural cele 45 *UAT_{rurale}* din Dobrogea de Sud sunt încadrate astfel: 11 - în rangul I, 6 - în rangul II, 19 - în rangul III, 9 - în rangul IV. Din asocierea resurselor patrimoniului natural din Dobrogea de Sud cu alte resurse turistice complementare, în prezentul studiu sunt propuse patru trasee turistice principale. Sistemul teritorial Dobrogea de Sud dispune de un patrimoniu natural divers, ce constituie un suport pentru dezvoltarea socio-economică a spațiului rural, prin turism. Prin complexitatea sa, analiza geografică a patrimoniului natural și cultural este o componentă a managementului turistic, un factor important ce contribuie alături de alte resurse cu specific cultural la dezvoltarea unui turism rural, sustenabil în Dobrogea de Sud.

REFERENCES:

- BOBANCU, Ș., 2014, Creativitate și invenție. Note de curs, Editura Universității Transilvania, Brașov, 162 p.
- BORDÂNC, F., 2008, Analiza regională a spațiului rural dobrogean, Editura Universitară, București, 350 p.
- CLAVAL, P., 2005, Reading the rural landscapes, In: Landscape and Urban Planning 70, Elsevier Ltd, p. 9-19.
- DAUGSTAD, K., 2007, Negotiating landscape in rural tourism, In: Annals of Tourism Research 35(2), Elsevier Ltd, p. 402-426.
- DRĂGUȚ, L., 2000, Geografia peisajului, Editura Presa Universitară Clujeană, Cluj-Napoca, 119 p.
- GRUIA, R., 2017, Management și dezvoltare în industria turismului, Editura LuxLibris, Brașov, 386 p.
- IANOȘ, I., 2000, Sisteme teritoriale, Editura Tehnică, București, 197 p.
- IONAȘCU, V., 2011, Dobrogea. Studiu de geografie a turismului, Editura Universitară, București, 175 p.
- IODAN, I., DOBRE, S.(coord.), 2005, Podișul Dobrogei, În: Geografia României, V, Editura Academiei Române, București, p. 758-790.

- PĂTRU-STUPARIU, I., 2011, Peisaj și gestiunea durabilă a teritoriului, Editura Universității din București, 214 p.
- POPESCU, M., URDEA, C., 2012, Rolul turismului în dezvoltarea economiei spațiului rural dobrogean, În: Economia agroalimentară și dezvoltarea rurală în România, Editura Academiei Române, București, p. 539-547.
- POPESCU, M., 2015, Management of ecotouristic resources from Southern Dobrogea Romania, In: Journal of Landscape Management 6(1), Brno, Czech Republic, p. 61-65.
- TOFAN, G., 2013, Mureșului Defile. Touristic potential, planning and capitalization, In: Analele Universității din Oradea, Seria Geografie, XXIII(4), p. 236-244.
- URDEA, C., 2008, Using GIS techniques to identify analyse landscape. Case study: the Măcin Mountains, In: Geographia Technica 3(1) Cluj-Napoca, p. 135-140.

IDENTIFICATION AND VALORISATION OF CULTURAL LANDSCAPE ELEMENTS IN THE APOLD-ORĂȘTIE VALLEY DEPRESSIONS

Eduard SCHUSTER*, Helena SCHUSTER**

Abstract. Cultural landscapes became a reality of the environment as soon as human groups brought permanent changes to their natural surroundings. The inherent dynamic of cultural landscapes may also effect the degradation or destruction of cultural-historically valuable elements. This is why a planned intervention for their restauration is the only viable solution for revitalising some of these landscapes. Unterwald can be considered such a cultural landscape in a broader sense, overlapping a historical region of the Transylvanian Saxons in the south-west of the Province stretching from Orăștie, to the west, to Amnaș, to the east, and comprising 14 settlements (3 towns and 11 villages). The heterogeneity of the landscape elements, caused by geographical and demographical factors, is in concurrence with the three parts of the region; nevertheless, there can be identified several types of cultural landscape (agricultural landscape, Saxon settlements with fortified churches, among others), each in various stages of preservation. Their valorisation should be centred around the idea of sustainability and local development, as the „creators” of this particular landscape are no longer present in the area.

Key words: cultural landscape, valorisation, Apold-Orăștie, Transylvanian Saxons settlements.

Introduction

Cultural landscapes became a reality of the environment ever since humans made the first permanent changes to their surroundings. Essentially, any landscape description ever made included also human-made elements that, by their simplest definition, can be considered part of the cultural landscape. Likewise, geographers started to study them as such almost from the beginning of modern geography, trying to define the as opposed to natural landscapes. In time, as geographical thinking evolved, the science of cultural landscapes developed its own principles and methods, and established criteria for identifying the components of a cultural landscape.

The inherent dynamic of cultural landscapes, with their constant quantitative and qualitative changes, can deteriorate some valuable cultural and historical elements (or even destroy them).

* Babeș-Bolyai University Cluj-Napoca, Faculty of Geography, Department of Geography at the Extensions – Bistrița, 3-5 A. Mureșanu str., RO-420174 Bistrița, eduard.schuster@ubbcluj.ro

** Liviu Rebreanu National College, 8 Republicii Blvd., RO-420057 Bistrița

That is why planned actions to restore these elements are the only solution if some landscapes are to be revived. To achieve this, social, political, and economical factors are those who have to decide on what actions are to be undertaken.

For the historic region of Unterwald, research on the cultural landscape (Schuster, 2017, p. 160) has revealed an ongoing deterioration, and very few, localised preservation and restoration actions. In some instances (such as Dobârca), heritage items are at the brink of destruction, making their retrieval almost impossible. This is the reason why we consider that cataloguing, mapping, and ranking the elements of the historical cultural landscape of Unterwald are urgent matters, on which decisions at regional level regarding the preservation and restoration of the cultural landscape rely significantly.

Theoretical framework

The notion of *cultural landscape* was introduced and established by Carl Sauer in his 1925 „Landscape Morphology”, where he defines the cultural landscape as being *fashioned out of a natural landscape by a cultural group* (Carl Sauer, Landscape Morphology, 1925, p. 46, cited by (Jackson, 2003, p. 14). The definition is simplistic and raises some questions regarding the meaning of „cultural group”; also rather simplistic is Sauer’s assertion that „culture is the agent, the natural area is the medium, the cultural landscape the result” (Jackson, 2003, p. 14). Sauer continues explaining that „under the influence of a given culture, itself changing through time, the landscape undergoes development, passing through phases, and probably reaching ultimately the end of its cycle of development” Gregory et al., 2009, p. 133). Thus, Sauer includes culture in the category of geographical agents, keeping, though, a central role for natural factors as an environment „with and through which human cultures act” (Gregory, Johnston, Pratt, Watts, & Whatmore, 2009, p. 133) in a binary fashion, both as an element adapting to the environment, and as a shaping agent of it.

Although the strict distinction between natural and anthropic is nowadays largely abandoned in favour of a „social nature”, viewed as a society-created environment (Gregory et al., 2009, p. 133), many definitions of cultural landscape still keep the notion of a landscape modified by human action, and consisting primarily of the products of this action (Witherick et al., 2001, p. 59); (Fouberg et al., 2012, p. 13).

Lately, however, there is an increased tendency to analyse cultural landscapes in temporal evolution (opposed to Sauer’s cyclic theory), in accordance with the deepening understanding of the ways each social and historic change leaves its mark on cultural landscapes. We can therefore speak about a *historical cultural landscape*, as long as the landscape-shaping elements are still active even after the social-historical conditions that initially created

them do no longer exist (Schreiber et Baci, 2008, p. 16). Consequently, considering the role of politic, social, and economic factors directly involved in landscape changes, the concept of *transcultural landscape* was suggested (Gregory et al., 2009, p. 133), defined as a cultural landscape created by cultural interaction.

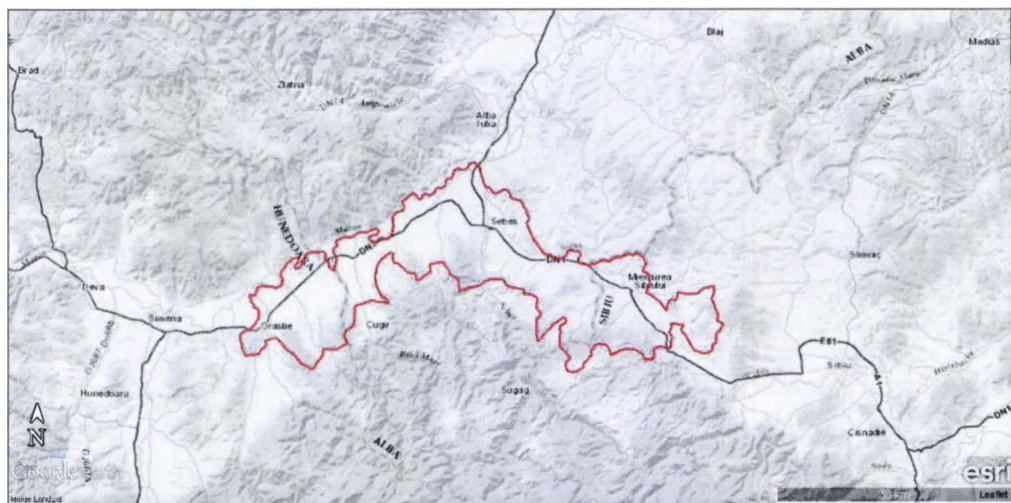


Fig. 1. Location of the historical region of Unterwald
(map created using Google Earth Pro and NatGeoMapmaker Topo base map)

About the historic region of Unterwald

Unterwald is one of the lesser known Saxon „Lands” from Transylvania, comparative to the more famous Weinland (Wine Country), Altland (Olt / Old Country¹), Burzenland (Brașov Region), or Nösnerland (Bistrița Region). Its name is translated as „Country Under the Forest”, with its medieval version *Land vor dem Wald / Terra Antesilvanica* (region in front of a woodland) keeping a more accurate description of the territory’s location at the foot of a densely forested Carpathian region. It is also the westernmost province of the Transylvanian Saxons, representing a transitional space between the Saxon core territories around and north of Sibiu and the Romanian lands situated to the south and east of it. Geographically, three features are relevant for the region: the hydrography (the rivers Secașul Mare, Sebeș, Mureș, and their subsidiaries); the Apold-Orăștie Depression, with its intertwined southern limit, towards the piedmont region; and the east-west oriented communications axis starting from Sibiu, through the road and rail junctions from Sebeș and Vințu de Jos, respectively, and ending at Simeria (Schuster, 2015, p. 26). The three Saxon Seats that historically formed the Land Under the Forest – Orăștie / Broos,

¹ There are controversies about the etymology of the region, with either „the region of the River Olt” („Alt” in German) or „the old region” (old = also „alt” German) being considered

Sebeş / Mühlbach and Miercurea / Reußmarkt – stretched over a much larger area in the mountains to the south, which was considered a hinterland of Unterwald, as it provided much of the resources that sustained the economic development of the towns of the region.

The cultural landscape of Unterwald

This region reveals a rather heterogenous cultural space, due to its geographical characteristics (the wing-like, elongated lowlands and the junction area between them have slightly different landscape features), as well as its demography (as its German, Saxon component dilutes in number and percentage from east to west, hence making the landscape of the Saxon villages with fortified churches less identifiable in the same direction). Consequently, each of the three units (roughly overlapping the old Seats) shows a distinct cultural landscape:

- The east wing is represented by the Apold Depression. Here, the Saxon heritage and the historic landscape are preserved the best and comprise settlements with compact street fronts and fortified church in the centre, and vineyard terraces. Here, the German population retained its majority until the beginning of the 20th century, preserving its lifestyle and spatial organisation. The market town of Miercurea, as the Seat's administrative centre situated on the main road between Sibiu and Sebeş, had a more pronounced territorial growth than the other settlements in the region, except Apoldu de Sus, whose area expanded through the colonisation of the so-called *Landler* from Austria in the 18th century. The geographical characteristics – a ENE-WSW oriented valley with transversal tributaries and elongated hills descending from the south – are responsible for the spatial distribution of landscape elements: vineyards on the south-eastern slopes and elongated settlements along the rivers.

- The central junction, at the confluence of the Secaş, Sebeş, and Mureş rivers. The cultural landscape in this area was largely influenced by the medieval town of Sebeş, as a demographic and economic centre. The rural settlements around the town (both Saxon and Romanian) adapted their economy according to the needs of the town, with vineyards and orchards to the west and east, husbandry to the south, and mixed agriculture in the north. More immediate needs were satisfied by the farms (*Meierhöfe*) surrounding the town until the 19th century, when the town incorporates the Romanian villages east and west of the respective gates, and the farms. This new spatial development determined the land use forms around the town for the next two centuries, creating a concentric pattern.

- The western wing, along the river Mureș (which borders the region to the north), still holds proof of the Saxons in the area through the territorial organisation (such as the form of the villages), but the only settlements with a noticeable Saxon population at the beginning of the 20th century were Orăștie and Romos, in the western part. Orăștie, the old Seat's centre, had initially the same development pattern as other Transylvanian Saxon towns, but it did not evolve into a fully fortified medieval town, instead keeping its church fortifications (still the second largest in Unterwald, after those of Sebeș). Here, the wide flat river valley effected a different land use, with more grain being cultivated and with vineyards only on some southern slopes.

Typology

The classification of the geographic information obtained through territorial analysis resulted in the identification of the following types of cultural landscapes, each of them with a variable extent:

- *The agricultural landscape*, consisting of pastures, hay meadows, vineyard terraces, bocage-like terrains (mostly rectangular, but with irregular shapes at the border with the Șureanu Mountains, they are still present in some areas and are mostly linked to the old vineyards, where they marked the borders of individual parcels;



Fig. 2. Dobârca – former vineyard terraces, partially reused as orchards
(photo: E. Schuster)

- *The landscape of villages with fortified churches* is arguably the best-known cultural landscape element linked to the Transylvanian Saxons, known as the *Kirchenburgenlandschaft* (fortified churches landscape). It comprises two main elements: the fortified church, whose skyline is so representative for the Saxon villages, and the compact

street fronts, also a landmark of the Saxon *Hufendorf* (villages of same-sized, elongated parcels perpendicular to the central axis of the settlement);



Fig. 3. The fortified churches are the best-known landscape element of most Saxon villages in Transylvania (upper row, left to right: Câlnic / Kelling, Amnaș / Hamlesch, Apoldu de Sus / Großpold; lower row, left to right: Dobârca / Dobring, Gârbova / Urwegen, Miercurea Sibiului / Reußmarkt)
(photos: E. Schuster)



Fig. 4. Closed street fronts are another visual landmark of Saxon villages (from left to right, upper row first: Apoldu de Sus / Großpold, Amnaș / Hamlesch, Dobârca / Dobring, Reciu / Rätisch)
(photos: E. Schuster)

- *The urban landscape*, consisting of the old towns of the former Seats' centres (especially Sebeș and Orăștie), with a distinct architecture (two- or three-storied buildings forming closed fronts along several streets around a central square market). Sebeș, in particular, includes parts of its medieval walls which are giving the old town its medieval look;



Fig. 5. The old towns of Orăștie (upper row) and Sebeș (lower row) show some similitude, as well as differences in their respective structure (photos: E. Schuster)

- *The industrial landscape* includes buildings related to economic activities (such as former watermills, roads, rail stations, factories, etc.). It does not constitute a cultural landscape by itself, as many of its components are no longer present and are only traceable through indirect evidence, but some elements are still present, standing as proof for the former economic activities (and serving as such, nonetheless: the best example are the railway stations erected at the end of the 19th century; or parts of the former state roads – *Landstraßen*, which are nowadays county or even agricultural roads, with sometimes hard to trace routes).





Fig. 6. Economic objectives from the beginning of the 20th century (from left to right: clothing factory in Sebeș, aqueduct from Petrești to Sebeș, old train station from Miercurea Sibiului) (photos: E. Schuster)

Identification and assessment of landscape elements

Assessing a landscape can be done both objective (quantitative method) or subjective (qualitative method) (Schreiber et al., 2008, p. 20). In the first case, the quantifiable elements - number, density, or size of the objects - can concur to set the value of a particular landscape (and to a rating of regional landscapes according to the numbers resulting from the evaluation). For this purpose, there can be used various survey templates, containing all elements relevant to obtain the object’s score: location, function, size, building materials, age, state of preservation, and images. The disadvantage of this method resides in it being not suitable to retain the symbolic value of an object, which can give it a much higher importance for the landscape.

Table 1. Example of a survey sheet (Apoldu de Sus)

Name	Landler house	
Location	Apoldu de Sus, nr. 210	
Photo		
Map		
Function	Housing	
Landscape element	Household	
Description (type, form, building materials, inscriptions, size)	House with elevated ground floor, cellar, attic, outbuildings, 4 rooms; brick + roof tiles; 14x10 m; walled gate; front wall inscription: „Mathias u. Maria Bayrsdorfer – 1906 –”	
Assessment of the object (importance, rarity, protection status, condition, etc.)	Corner house on the first Landler street in Apoldu de Sus, near the old school. Typical building, with four wooden window shutters. Civilian use, medium degradation.	

(after Schreiber et al., 2008, p. 21)

In the second case, the method is used to conduct a global evaluation of the landscape and its aesthetic value, hence the subjective character. In order to assess the subtle value of a landscape, the surveyor can try to quantify the importance of each of the landscape's elements to those who come in direct contact to them by using tailored survey forms. This is called the Adam-Nohl-Valentin Method (Schreiber et al., 2008, p. 20) and has the merit to try a quantification of the qualitative characteristics of a landscape based on largely subjective assessments.

Condition of the landscape elements

The preservation status of the landscape elements has to be viewed differently according to their nature and their value. Thus, for example, a house located within a street front and showing visible degradation signs will not have the same visual impact on the general image of the landscape as a fortified church with the same degradation percentage. But if the number of houses with degraded or even ruined façades is sufficiently high, this will significantly impact the landscape.



Fig. 7. Apoldu de Sus. Landler house
(photo: E. Schuster)



Fig. 8. Dobârca. The vandalised interior
of the evangelical church
(photo: E. Schuster)



Fig. 9. Miercurea Sibiului. Vineyard
terraces covered with secondary
vegetation (photo: E. Schuster)



Fig. 10. Sebeș. Renovated street front
(photo: E. Schuster)

In this context, the gap between centre and periphery is highly visible. The towns in the region, as well as neighbouring villages (i.e. Petrești near Sebeș), had benefited the most from urban regeneration measures, while more remote villages reveal a generally poor image, and sometimes even ruined elements (i.e. Dobârca). Furthermore, there is a focus on renovating buildings - houses, churches, walls, institutions - and main street fronts, while the adjacent area (comprising elements such as vineyard terraces or roads) remains practically untouched by preservation and restoration actions.

Valorisation potential of some elements of cultural landscape in the historic region of Unterwald

A proper valorisation of any kind of cultural landscape should primarily aim to protect all objects and to assure a sustainable development of the local communities inhabiting the region. Therefore, a carefully undertaken tourism planning and marketing, followed by a variety of tourism projects with sustainability as the main idea, could help satisfy both initial goals - preservation and local development, with awareness-rising as a positive by-product.

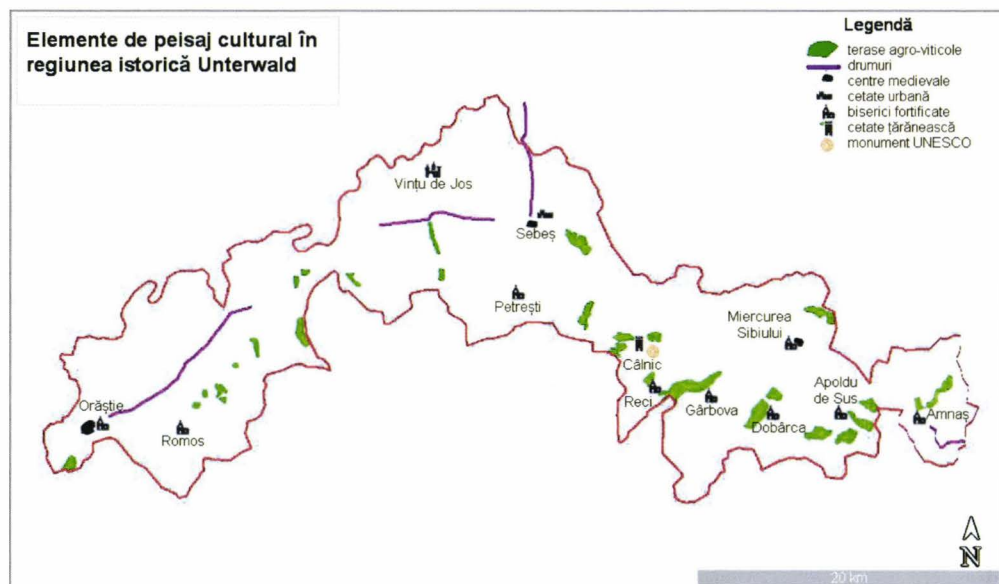


Fig. 11. Analysing the spatial distribution of several elements of the cultural landscape in Unterwald reveals a certain territorial grouping, which could give some indication about what type of tourism should be implemented in each subregion (map created using Google Earth Pro)

We identified three phases of such a undertaking, at the same as providing several solutions for the implementation of a presumptive future project:

- *Phase I*: identifying and cataloguing the elements holding some tourist potential (situation analysis);
- *Phase II*: identifying types of tourism and target groups. Here, cultural tourism, food tourism, and genealogy tourism come to mind, with groups such as students, emigrants and their descendants, but also a wider range of culture and food loving tourists as the primary visitors;
- *Phase III*: elaborating the detailed plan and implementing its elements (tourism planning). For this region, the best way to get funds for this kind of project might be a collaborative project financed by the EU, with specialists, local public administrations, and local communities being all part of the planning and implementation process.

Concluding, the historic cultural landscape in the Apold-Orăștie Corridor (Unterwald) needs a competent analysis, including the identification and categorisation of valuable items, followed by a prioritisation of reconstruction actions and implementation of viable projects aimed to maintain a balance between the need for development of the local communities and the necessity to salvage a culture which shaped the destiny of the region for eight centuries.

Rezumat. Peisajele culturale au devenit o realitate a mediului înconjurător începând cu primele modificări permanente induse mediului natural de către societățile umane. Practic, orice descrieri peisagistice au inclus, invariabil, elemente de natură antropică asimilabile peisajului cultural, în definiția sa cea mai simplă. Dinamica inherentă a peisajelor culturale, care suferă constant modificări de ordin cantitativ și calitativ, poate avea ca efect deteriorarea unor elemente valoroase din punct de vedere cultural-istoric (sau chiar distrugerea lor). De aceea, intervenția planificată spre a restaura anumite elemente devine unica soluție dacă se dorește revitalizarea anumitor peisaje. Unterwald nu este nici o unitate fizico-geografică distinctă, nici o unitate politico-administrativă (fie ea și de acum câteva secole) unitară, ci o întrepătrundere a acestora, peste care se așază ca un liant un spațiu mental creat de sașii din zonă, care cuprindea fâșia locuită de sași dintre Amnaș, la est, până la Orăștie, în vest; în particular, este vorba de cele 14 localități săsești – orașe și sate – care compun această fâșie. Acest teritoriu se caracterizează printr-o relative eterogenitate a elementelor spațiului cultural, indusă de factorii geografici și demografici. Se pot distinge astfel trei subunități, fiecare cu un peisaj cultural specific, suprapuse, în mare, teritoriilor celor trei scaune săsești din zonă. Clasificând informațiile geografice obținute din analiza teritorială se pot identifica următoarele tipuri de peisaje culturale, fiecare dintre ele cu prezență teritorială variabilă: peisaj agricol; peisajul așezărilor rurale cu biserici-cetate; peisajul urban; peisajul economic. Orașele regiunii, precum și localitățile din proximitate au beneficiat cel mai mult de pe urma acțiunilor de renovare urbană, pe când localitățile mai îndepărtate afișează o imagine generală precară, cu episoade de ruină. Măsurile de conservare și restaurare vor trebui aplicate pentru întreg fondul arhitectonic al ansamblurilor medievale urbane, precum și pentru perimetrele habitatelor rurale așa cum arătau ele până în sec. 18-19, la care se adaugă spațiul rural

agricol – terasele viticole care nu sunt utilizate în prezent sau care nu au fost degradate prin diverse utilizări în ultimul secol.

REFERENCES:

- FOUBERG, E. H., MURPHY, A. B., & DE BLIJ, H., 2012, *Human Geography. People, Place, and Culture* (10th ed.), John Wiley & Sons, Inc., Hoboken, NJ, 562 p.
- GREGORY, D., JOHNSTON, R., PRATT, G., WATTS, M. J., & WHATMORE, S. (Ed.), 2009, *The Dictionary of Human Geography* (5th ed, Wiley-Blackwell, Chichester, UK, 1052 p.
- JACKSON, P., 2003, *Maps of Meaning. An introduction to cultural geography*, Taylor & Francis e-Library, London and New York, 213 p.
- SCHREIBER, W. E., & BACIU, N., 2008, *Die historischen Kulturlandschaften Rumäniens und ihre Verwertungsmöglichkeiten. Geographia Napocensis*, II(1), pp. 14-21.
- SCHREIBER, W. E., TURCU, C., & CONSTANTIN, A., 2008, *Schutz- und Verwertungsstrategien von historischen Kulturlandschaften. Geographia Napocensis*, II(2), pp. 19-28.
- SCHUSTER, E., 2015, *Așezările germane din culoarul Apold-Orăștie (Unterwald). Studiu de geografie istorică*, Napoca Star, Cluj-Napoca, 176 p.
- SCHUSTER, E., 2017, *Conservarea și restaurarea peisajului cultural din Unterwald, din perspectivă geografică*, *Buletinul Bibliotecii Române din Freiburg*, IV (XXV), pp. 158-165.
- WITHERICK, M., ROSS, S., & SMALL, J., 2001, *A Modern Dictionary of Geography* (fourth ed.), Arnold, London, 293 p.

THE TYPOLOGY OF CULTURAL LANDSCAPES IN THE BÂRGĂU AREA

Lia-Maria CIOANCA*

Abstract. The cultural landscape fulfils various functions and valences, or it may be regarded as a brand, as certain strictly individualized elements are unique and unrivalled in their originality, which gives them the status of symbols, features that we can clearly attribute to the Bârgău area. The typology of cultural landscapes in this land derives from the fact that man, through his conscious action upon nature and his creativity, is at the origin of the cultural landscape resulting from the interference of man with his living environment and which gradually becomes exploited as such in all other field and in a completely different purpose than originally foreseen.

Key words: geographical landscape, cultural landscape, human intervention, landscape symbols.

The cultural landscape - conceptual frameworks

When trying to define the *cultural landscape*, it is necessary to stem from the numerous meanings of the word „culture”, from the fundamental and spiritual component of the human being to the quotidian component of some agricultural activities, from institutions meant to promote cultural values to the very tools needed to work the land (Cocean, 2006).

Therefore, according to DEX (1975), the concept of *cultural landscape* may be defined as: „*the totality of material and spiritual values created by mankind throughout the process of the socio-historical practice...*”

One must understand and perceive the landscape as a place of living and working through the perspective of those who live and work there. All landscapes are *symbolic*, they express a persistent wish to transform the image of the land into the image of a salutary realm and they undergo various changes as they are the expression of society, which, in its turn, becomes history in time.

The geographical landscape represents, in a definition found in all expert books, the natural landscape transformed by the impact of human action, while the *cultural landscape* represents “the entire *geographical landscape*, as its natural elements have been modified through the human activities, the landscape thus becoming the cultural construction of nature” (Cocean et David, 2014).

Consequently, the cultural landscape comprises of anthropogenic, natural elements and elements resulting from man’s communion with the nature of the place.

* Babeș-Bolyai University Cluj-Napoca, Faculty of Geography, Bistrița Extension, 3-5 A. Mureșanu Street, 420117 Bistrița, e-mail: lia_cioanca@yahoo.com.

In some special circumstances, such as the case of symbolic or historic landscape, man integrates the natural element in his own creation, emphasizing the essential features and enforcing them by granting them various meanings.



Fig. 1. View over the land of Bârgău (www.ecoaequilibrium.blogspot.com)

2. The typology of cultural landscapes in the land of Bârgău

2.1. Agricultural landscapes

The presence of these landscapes is determined by the practice of activities specific to planting on natural soil, the terrain thus becoming the key-element on which anthropogenic elements determined by the exploitation type are based. Hence, there is a large variety of landscapes, such as: the landscape of growing cereals and vegetables, the landscape of orchards with bushes and fruit trees, the mixed agricultural landscape (with vegetables, fruit trees, meadows).

Agricultural landscapes are largely one and the same with what we call „rural landscapes” because the prevailing type of landscape is tightly connected with the rural means of inhabiting the land. Rural landscapes represent the most complex method of characterizing the specificity of the land, and agricultural landscapes are merely a part of them (Cocean et David, 2014).

Natural meadows witnessed an ongoing process of expansion (through vast deforestation actions), as a result of the increase of the anthropogenic pressure upon the land and the number of animals, and therefore, nowadays, it represents the main source of support in the zoo technical sector of the region.

Agriculture remains an essential economic activity for the inhabitants of the land of Bârgău, even if this aspect is not reflected by the professional structure of the population. The soil and climate conditions impose the sector of raising cattle as the main support pillars of this branch, followed closely by that of growing vegetables (on more reduced surfaces), especially potatoes.

Regarding the means of using agricultural lands, meadows and pastures represent the largest percentage at the level of the mountain unit, followed by croplands, orchards and meadows (which are diminishing both as surface and predominance, during the beginning of the last decade of the XXth century and the end of the first decade of our century) (Bâca, 2012).

The largest part of agricultural lands are under private property, whereas the public domain mainly has forest lands (nearly 50, 0% of all) and, secondly, with pastures (25, 0%). On the other hand, during the communist regime, agricultural lands in the land of Bârgău were not part of collectivization, while forests were returned (since 1991), a process that has not yet ended (Costea, 2016).

Regarding the growing of vegetables, there have been significant mutations related to their presence between the end of last century and the first part of the XXIst century, in the sense that, as it was only natural, taking into account the natural features of the mountainous land, the occurrence of growing cereals (wheat, rye and corn) has diminished in favor of growing potatoes and vegetables. The crops of the main cereal plantations (corn, wheat and rye) are extremely low, for which reason it is necessary either to gradually give up on these crops and to replace them with others, adaptable to the local conditions, or to practice agriculture with better results (by selecting seeds, vast mechanization works and fertilization) (Costea, 2016).

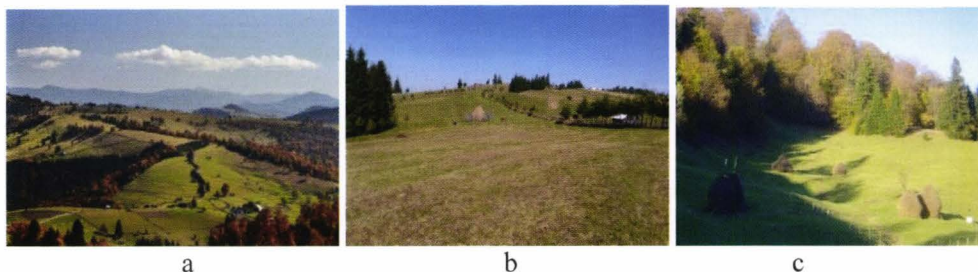


Fig. 2. (a, b, c) Agricultural landscapes in the land of Bârgău
(www.ecoaequilibrium.blogspot.com)

2.2. Forest cultural landscapes

This type of landscape is closely related to the agricultural one, most of the cultivated lands being initially integrated in the forest domain, as they were deforested in view of changing the means of purpose.

The anthropogenic intervention of shaping the forest landscape may have a voluntary character, designed when this is pre-established and aims to variously exploit this natural resource that has such great economic importance. Thus, the hydrotechnical settlements, located especially in the arboraceous mountain areas, require deforestation of the areas affected by the future man-made lakes (the Colibița lake); the building of transportation lines for electric power or

pipes also requires the freeing of the track from forest vegetation in the area; the arrangement of tourist territory in order to practice skiing also means there will be massive interventions upon the existing vegetation (such as the skiing slope at Piatra Fântânele) (Cocean et David, 2014).

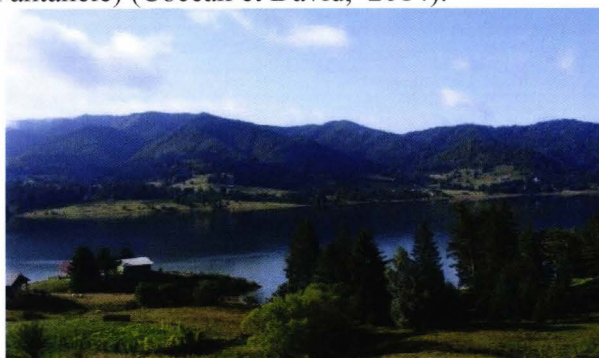


Fig. 3. The Colibița man-made lake (www.turistinfo.webs.com)

Plantation forests occupying surfaces that have been recently deforested or degraded are different from the standard forest, as they are the result of human intervention, which grants them the status of „cultivated forests”, having areas that are much smaller and a certain ordering of the trees, something that the initial forest lacked, and we may mention here the spruce, pine, and fir tree plantations (Cioanca, 2013).



Fig. 4. Spruce tree plantation in Bârgăului Mts.
(www.turistinfo.webs.com)

2.3. Tourist landscapes

Tourism, as an on-going field, is the direct and indirect beneficiary of elements and infrastructures of other domains, such as the agricultural, forestry, commercial ones, and will comprise, consequently, components of these domains, so that one may distinguish in the Bârgăului land between mountain tourist landscape with arrangements for winter recreation (the ski slope at Piatra Fântânele), the landscape of climatic tourist resorts with healing and recreation purpose (the Colibița lake, also called „the sea between the mountains”, a place

where one can breathe the freshest air in the country, currently a local interest tourist resort), the landscape of tourist villages, which may increase as a result of implementing projects for tourism promotion in the area, the landscape of isolated tourist bases, such as cabins, inns, camping sites, shelters and refuges that have become more and more popular in the last 5 years and have benefitted from promotion both in the country and abroad (Cioanca, 2013).

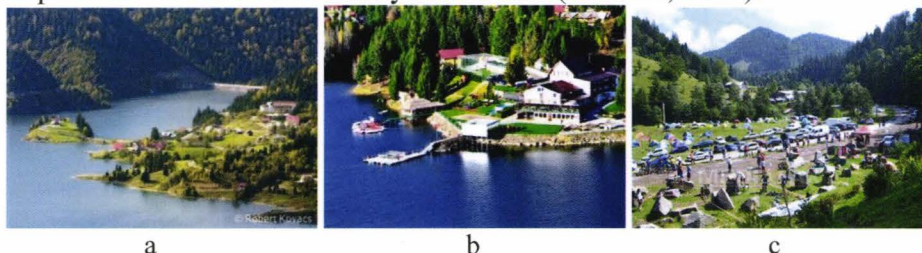


Fig. 5. (a-c) Tourist landscapes in Colibița (<http://robert-kovacs.ro>)

2.4. Ritual landscapes

From this category we may mention monasteries, churches, roadside crosses and crucifixions; the *Cross at Piatra Fântânele* being one such example, with a height of 31 meters; it has become a pilgrimage site and offers a panoramic view over the surroundings of the place.



Fig. 6. The Cross at Piatra Fântânele (www.turistinfo.webs.com)

2.5. Symbolic landscapes

These landscapes include a series of elements with a special spiritual meaning, be it religious, cultural, historical, political or social, which had the symbolic purpose of representing time by commemorating some historical events, facts or periods. Telling examples are the *Roadside cross and monument at Prundu Bârgăului*, built to commemorate the martyr heroes from 1944, the *Heroes Monument from Rusu Bârgăului*, *The Heroes Monument from the*

Gruicul Mare Peak, where there is an annual religious ceremony to commemorate the 60 Romanian heroes from the Border guard battalion 56 Fălticeni, fallen in battle during World War I (Cordovan, 2011).



Fig. 7. The Monument at Gruicul Mare (www.sursa.cronica.de.falticeni.com)



Fig. 8. The Heroes Monument at Prundu Bârgăului (www.rasunetul.ro)

In conclusion, we may state that man, by his action upon nature and by his creativity, is at the origin of the cultural landscape, resulting from the interference of man and his lifestyle and which gradually reaches to an exploitation in a different domain than the previously aimed one. The cultural landscape thus gets to accomplish various functions and valences, such as the aesthetic, economic, social, environmental one, or it may be viewed as a brand, as some strictly customized elements are unique and novel through their originality, through their architectural, dimensional or functional traits, which

grants them the status of symbols or reference elements in the attractiveness of the place, features that we may obviously apply to the land of Bârgău.

Rezumat. Peisajul cultural îndeplinește diverse funcții și valențe sau poate fi privit ca un *brand*, întrucât anumite elemente strict individualizate sunt unice și inedite prin originalitatea lor, ceea ce le conferă statut de simboluri, caracteristici pe care le putem atribui în mod evident ținutului Bârgăului.

Tipologia peisajelor culturale din acest ținut reiese din faptul că omul, prin acțiunea sa conștientă asupra naturii și prin creativitatea sa, se află la originea peisajului cultural rezultat din interferența omului cu mediul său de viață, care ajunge treptat să fie exploatat ca atare în cu totul alt domeniu și într-un scop complet diferit de cel prevăzut inițial.

REFERENCES:

- BÂCA, I., 2012, Arealul turistic Piatra Fântânele-Măgura Calului, Editura Argonaut, Cluj-Napoca, pp. 83-94.
- CIOANCA, L.M., 2013, Fenomene geografice de risc în Munții Bârgăului, Teză de doctorat, unpublished.
- COCEAN, P., 2006, Turismul cultural, Editura Presa Universitară Clujeană, Cluj-Napoca, pp. 37-42.
- COCEAN, P., DAVID, N., 2014, Peisaje culturale, Editura Risoprint, Cluj-Napoca, pp. 9-22, pp. 37-64.
- CORDOVAN, I., 2011, Recunoștință pentru eroi. Monumente dedicate eroilor în județul Bistrița-Năsăud, Editura Eikon, Cluj-Napoca, pp. 45-70.
- COSTEA, C., 2016, Munții Bârgăului. Studiu de geografie umană, Editura Karuna, Cluj-Napoca, pp. 132-143, pp. 229-246.
- www.ecoaequilibrium.blogspot.com
- www.rasunetul.ro
- www.turistinfo.webs.com
- www.sursa.cronica.de.falticeni.com
- <http://robert-kovacs.ro>

A BIKE TOUR PROPOSAL TO THE MINERAL SPRING SPAS OF THE HARGHITA MTS., ROMANIA

Eduard SCHUSTER*, Andras-Istvan BARTA*

Abstract. Romania has the highest number of mineral springs in Europe, due to its unique tectonic underground. Many of them are related to the post-volcanic activity in the Eastern Carpathians, being located around the major volcanic mountains in the region (Călimani, Gurghiu, Harghita). The certified quality of their mineral waters and their health benefits effected the establishment of numerous spas, mostly of local and regional importance. The economic breakdown of the country in the 1990s caused many of these facilities to deteriorate, so that many of them are no longer in use. We believe that a tourist circuit of these springs and spas could raise awareness of their potential and thus trigger actions to revive them.

Key words: mineral springs, spas, biking circuit.

Introduction

The Harghita Mountains are located in the south-western part of the central sector of the Eastern Carpathians (fig. 1), representing the southern-most region of the volcanic mountain chain of the Carpathians (Schreiber, 1994, p. 9). They are limited to the NW by the Gurghiu Mts. and the Târnava Mare River, to the north the Mureș Valley and the Giurgeu Depression, to the east, the Ciuc Depression, to the south the Baraolt Mountain and Depression, and to the west the Transylvanian Depression (more precisely, its eastern border, known as the Transylvanian Subcarpathians; Schreiber, 1994, p. 12).

The Harghita Mountains are composed of two distinct regions: the actual mountain range, comprising 10 volcanic cones, that can be also divided in two sections – a northern, higher one (with the highest point reaching 1800 m in the Harghita-Mădăraș peak), and a southern, lower one (maximum height 1558 m in the Cucu peak), divided by the Vlăhița Pass (980 m); and the volcanic plateau, stretching westwards, at the foot of the mountain range, with altitudes between 750 and 1000 m (Schreiber, 1994, p. 17).

It is precisely their volcanic origin that effected the occurrence of so many mineral springs, among other post-volcanic phenomena. From the more of 400 mineral springs in the Eastern Carpathians, most of them (34,7%) are bicarbonate-carbonated (Ciangă, 1998, p. 61), and the highest density of these springs is found in the Călimani – Harghita area, with the Harghita Mountains and the Olt River Valley holding the majority of them (Ciangă, 1998, p. 66).

*Babeș-Bolyai University Cluj-Napoca, Faculty of Geography, Department of Geography at the Extensions – Bistrița, 3-5 A. Mureșanu str., RO-420174 Bistrița, eduard.schuster@ubbcluj.ro

Some of these mineral water sources are utilized in large health resorts, such as Băile Tușnad, where the spring has a flow of 7,18 l/s, of which only 25% is used for therapy procedures (Ciangă, 1998, p. 68), while smaller mineral water sources are utilized locally: Miercurea Ciuc, Racu, Băile Harghita, Băile Mădăraș, Băile Dănești, Băile Madicea, Jigodin, Valea Întunecoasă, Bancu, Sânmartin, Cicani, Cozmeni, Lăzărești, Pucioasa-Sântimbru (all of them totaling a flow of 1 l/s), and, on the western side of the Harghita Mts., Praid, Corund, Băile Homorod and Băile Chirui (total flow 1,3 l/s). It is estimated that the flow of all springs in the local spas in the Harghita County is as high as 813000 l/24 h (Ciangă, 1998, p. 69).

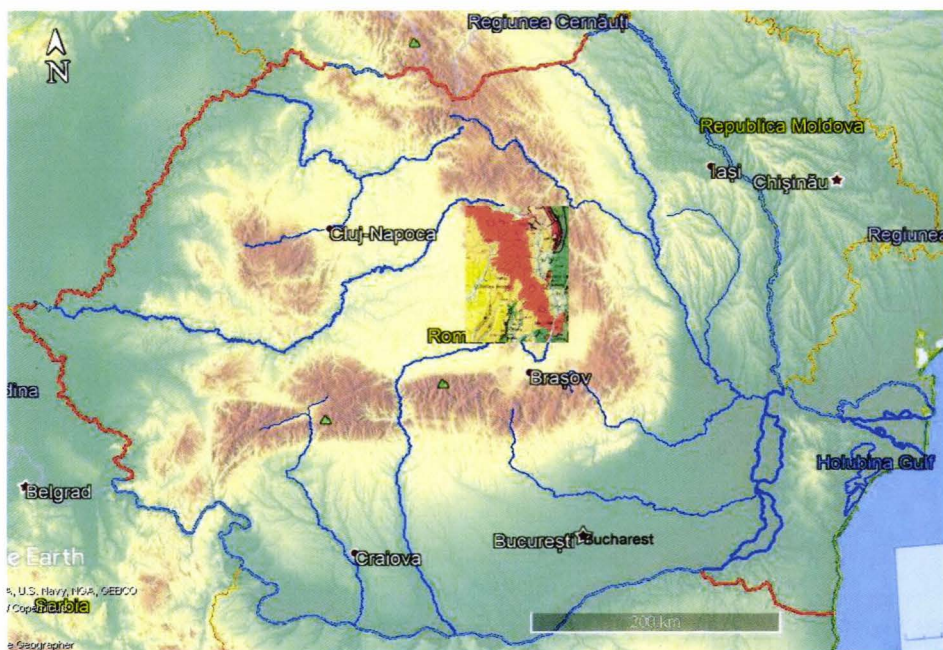


Fig. 1. Geographical location of the Harghita Mts., shown as a geological map overlay (map created using GoogleEarth Pro with a relief map layer from <https://maps-for-free.com/> and an excerpt from the Geological Map of Romania 1:200.000 on <http://www.geo-spatial.org/download/harta-geologica-a-romaniei-scara-1-200-000>)

Biking as an eco-friendly form of tourism

Bicycle touring has become an increasingly popular form of outdoor activity, contributing to the participants' health, as well as to the environment. If in western Europe it is a wide-scale free-time activity, with bicycle tour associations and a well-established infrastructure, in Romania it is still in its beginning stages, with a poor biking infrastructure. This is one of the reasons behind this bike tour proposal, as it may raise awareness on both the health benefits of outdoor activities, as well as on the use of local mineral water

springs that have been largely neglected in recent decades, even if (or maybe exactly because of) they are located in a region with the highest concentration of this kind of resource.

There is a variety of bicycle tours, depending on their length, duration, self-support-capacity or purpose. Given the characteristics of our proposed tour, it can be included in the *lightweight touring category* (also called credit-card touring), where the rider carries a minimum of equipment, opting instead to pay for accommodation, food and other necessities along the way (Alff, 2013, p. 9). This is true in that we do not intend to unnecessarily lessen the experience of the countryside and the mineral springs visited by carrying additional equipment (such as camping gear) and food, given the proximity of accommodation facilities and eating places all along the route.

Materials and methods

The cartographic documentation for this paper was paramount, as it helped us identify not only the best route, but also the location of some of the lesser known mineral springs of the Harghita Mountains. Aside from the cartographic materials used for the location map (fig. 1 caption), we also used the *Tourist road atlas of Romania (2001 edition)*, sections 62, 63, 84 and 85 to identify all our stations. Furthermore, some information regarding place names and other topographical data has been gathered from the online map application INIS Viewer (<http://geoportal.ancpi.ro/geoportal/viewer/index.html>), as well as from topographical maps at the scale 1:100.000.

The elevation profiles were constructed for each leg in Google Earth Pro, from where the elevation gain / loss, maximal and average slope were extracted.

Choosing the best route. The proposed bicycle tour is intended to offer a diversity of travel experiences along its route, and is therefore drawn over a variety of terrains, from modern national roads (where necessary) to field roads or even footpaths along railways. The route is also designed to be effort-minimizing, by finding the shortest and less sloped roads and paths, without sacrificing the riding experience. The main problem in identifying the best route was that the region has no bike trails to speak of, and the routes uploaded by bikers on various online platforms (such as bikemap.net) do not cover our intended tour.

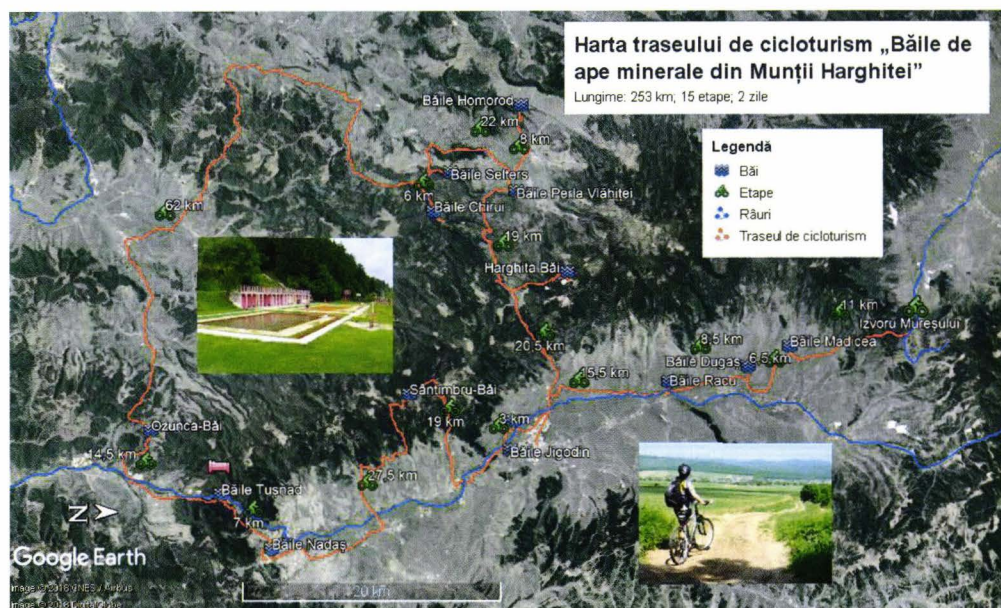


Fig. 2. Overview of the bike route (the legend indicates spas, legs, rivers, and the route)

Bike tour presentation

The bike route we propose (fig. 2) has a length of 253 km, and we have split it on two days, with 100 km on the first day (from Izvoru Mureșului to Băile Tușnad), and 153 km on the second day, respectively. We chose this particular division for two reasons: Băile Tușnad is a renowned health and vacation resort, offering the necessary accommodation and, if needed, bike repair facilities; and the second day stage has a leg of over 60 km (the east-west passage) which runs entirely on public roads, so the overall speed is increased, allowing for the completion of the circuit in approximately 8-9 hours per day, depending on road conditions and the time spent at each stop.

Day I (100 km)

First leg (Izvorul Mureșului – Băile Madicea)

The tour starts in Izvorul Mureșului, a resort and sports training centre, some 20 km south of Gheorgheni, from the DN12 national road, near the milestone nr. 115 (fig. 3), where a field road is heading south, crossing the Lunca and Rața streams to reach the mineral spring at Băile Madicea. The leg is 11 km long, has a maximum slope of 20,8% / -19,9%, average slope of 6,1% / -6,1%, and an elevation gain / loss of 310 m / -379 m (fig. 3).

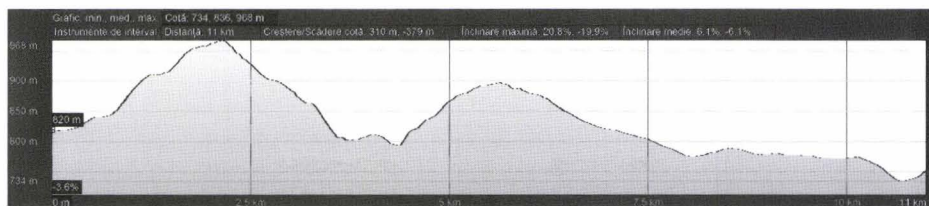


Fig. 3. First leg elevation profile

Second leg (Băile Madicea-Băile Dugaș)

From the Madicea Valley, the route descends towards the village of Dănești, entering it from NW. It then crosses the village southwards, reaching Băile Dugaș after 6,47 km, south-west of the village. Elevation gain / loss is 47,9 m / -83,1 m, maximum slope is 8,8% / -8,3%, and average slope is 1,6% / -2,2% (fig. 4).

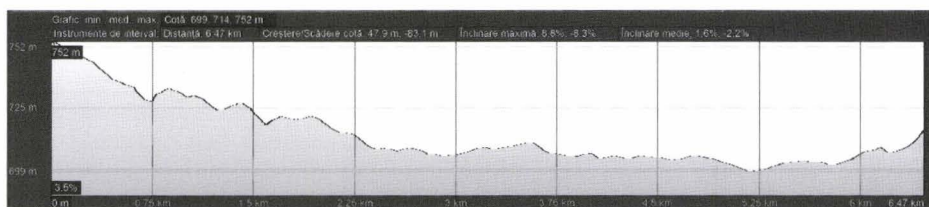


Fig. 4. Second leg elevation profile

Third leg (Băile Dugaș- Băile Racu)

From Băile Dugaș, the route takes a field road towards the village of Mădăraș, entering it from NW and crossing it southwards, continuing along the railway until Băile Racu. The leg is 6,45 km long, has an elevation gain / loss of 66,6 m / -93,3 m, a maximum slope of 10,2% / -14,9% and an average slope of 1,9% / -1,8% (fig. 5).

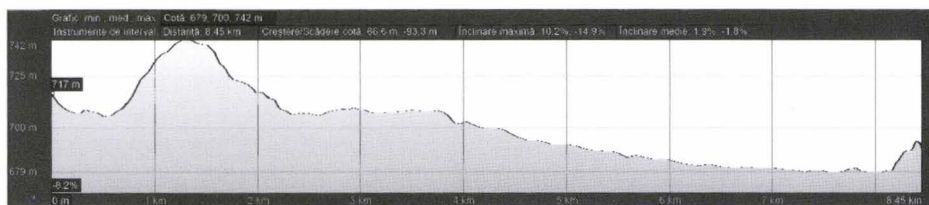


Fig. 5. Third leg elevation profile

Fourth leg (Băile Racu- Băile Miercurea Ciuc)

From Băile Racu, the route heads towards the village of Siculeni, along the Silaș River and crossing the River Olt, then southwards across the village. After crossing the Varu stream, it continues southwards, crossing the villages of Ciaracio and Ciba (and the Capcinaș stream between these two localities), exiting the latter to south-east towards Miercurea Ciuc, on the DN13A national

road, crossing again the River Olt. The leg is 15,4 km long, has an elevation gain / loss of 98,4 m / 123 m, a maximum slope of 13% / -13,2 % and an average slope of 1,2% / -1,5% (fig. 6).

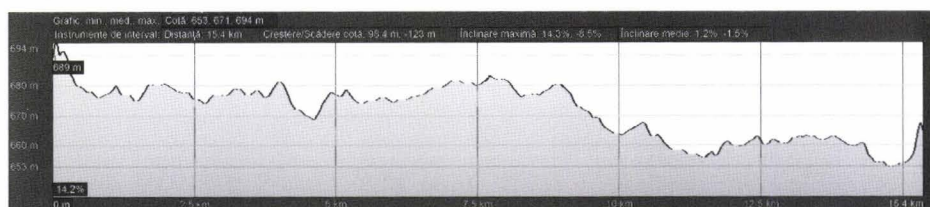


Fig. 6. 4th leg elevation profile

Fifth leg (Băile Miercurea Ciuc-Băile Jigodin)

From Miercurea Ciuc, the route crosses again the River Olt and is heading towards the village of Jigodin, entering it from NW. The leg is 2,9 km long, has an elevation gain / loss of 55 m / -54 m, a maximum slope of 13% / -13,2%, and an average slope of 3,6% / -3,6% (fig. 7).

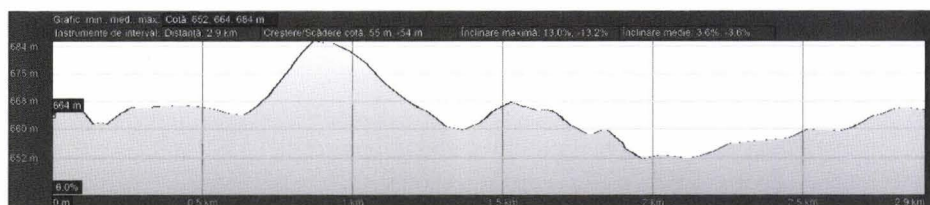


Fig. 7. 5th leg elevation profile

Sixth leg (Băile Jigodin-Sântimbru Băi)

From Băile Jigodin, the route continues on the DN12 national road along the River Olt, crossing the village of Sâncrăieni and leaving it to SW. From Sâncrăieni, it follows the Valea Mare river, climbing a mountain road until Sântimbru Băi. The leg has a length of 19 km, an elevation gain / loss of 663 m / - 106 m, a maximum slope of 16,6% / -11,4%, and an average slope of 4,3% / -2,2% (fig. 8).

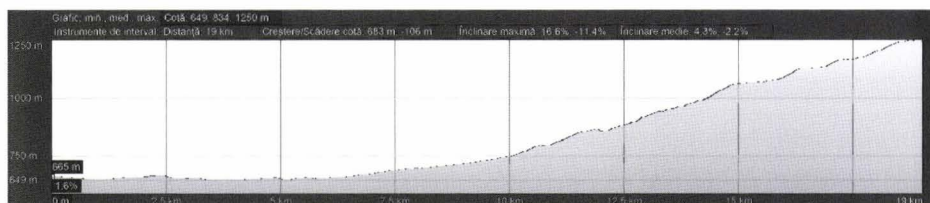


Fig. 8. 6th leg elevation profile

Seventh leg (Sântimbru-Băi-Băile Nadeș)

The route descends along the Mina stream until the forest edge, then follows a forest road for 3,5 km, then heads south towards the village of

Sinsimion. From here, we take the DJ123A county road south until Tuşnad, then the DN12 national road until Tuşnadu Nou. At the village entrance, we steer left on a field road until Băile Nadaş. The leg is 27,6 km long, has an elevation gain / loss of 432 m / -939 m, a maximum slope of 17,9% / -30,9%, and an average slope of 3,2% / -5,7% (fig. 9).

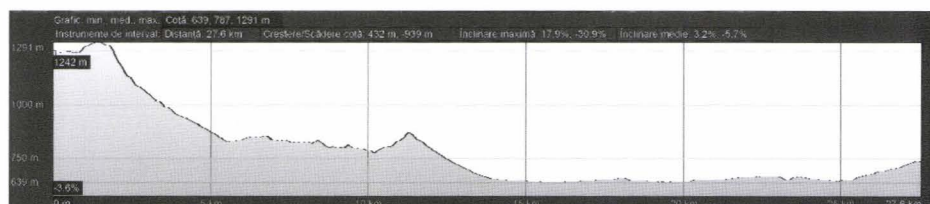


Fig. 9. 7th leg elevation profile

Eight leg (Băile Nadaş- Băile Tuşnad)

From Băile Nadaş, the route continues on a field road until the DN12 national road, which we follow to Băile Tuşnad. The first stage of the bike tour ends here, where accommodation can be obtained in one of the resort's many establishments. Optionally, a trip to the nearby St. Ana crater lake can be made. The leg has a length of 6,95 km, an elevation gain / loss of 84,4 m / -156 m, a maximum slope of 11,5% / -18,2%, and an average slope of 2,6% / -3,8% (fig. 10).

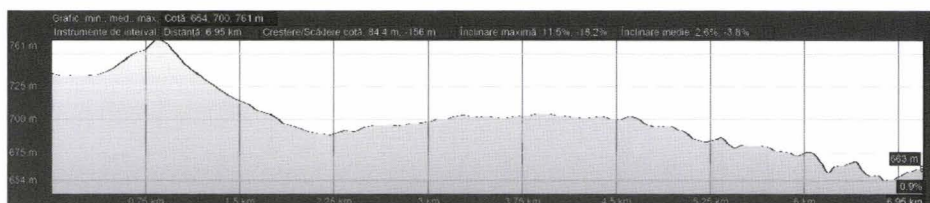


Fig. 10. 8th leg elevation profile

Day II (153 km)

Ninth leg (Băile Tuşnad-Ozunca-Băi)

The second day, we leave Băile Tuşnad southwards, following the DN12 national road for about 8 km until the stone quarry on the right, where we cross again the River Olt and engage a field road south to the Murgul Mic Hill, reaching Ozunca-Băi after 2 km. The leg is 14,6 km long and has an elevation gain / loss of 345 m / -369 m, a maximum slope of 21,1% / -19,8 %, and an average slope of 4,8% / -4,3% (fig. 11).

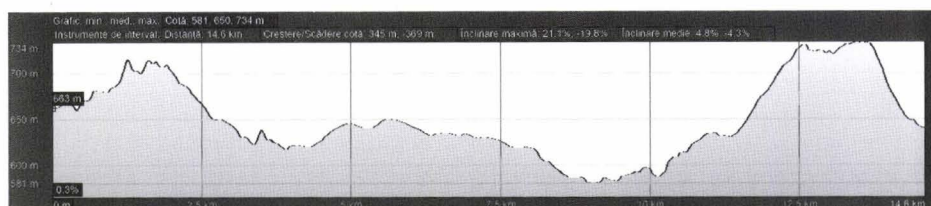


Fig. 11. 9th leg elevation profile

10th leg (Ozunca-Băi-Băile Selters)

This is the longest single leg of the entire circuit (over 60 km), making the transition from the eastern to the western side of the Harghita Mts., which is why it is a mainly asphalt road route. From Ozunca-Băi, the route is heading SW to the DJ122 county road, following it through the villages of Bățanii Mari and Biborțeni until Baraolt. From here, the route enters the DJ131 county road northwards until Ocland, from where it takes the DJ132 county road to Merești. At the end of the village, it is heading eastwards on a communal road along the Valea Vârghișului stream until Băile Selters. The leg is 62,6km long, has an elevation gain / loss of 845 m / -777 m, a maximal slope of 15,4% / -13,1 %, and an average slope of 2% / -2,1% (fig. 12).

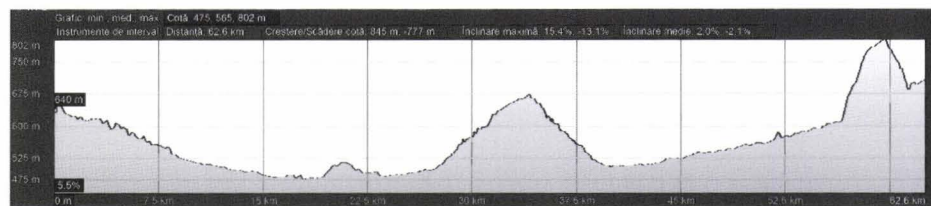


Fig. 12. 10th leg elevation profile

11th leg (Băile Selters- Băile Chirui)

Nearby lies Băile Chirui, which we can reach following back the Valea Vârghișului stream until its confluence with the Chirui river. Climbing a forest road along the Chirui river, we arrive at the location after approximately 3 km. The leg is 6,37 km long, has an elevation gain / loss of 110 m / -91,6 m, a maximal slope of 11,1% / -17,3%, and an average slope of 3% / -2,8% (fig. 13).



Fig. 13. 11th leg elevation profile

12th leg (Băile Chirui-Băile Homorod)

Returning to the intersection with the road that leads to Băile Selters, we turn westwards on a communal road until Lueta, where we take the DJ132 county road until Vlăhița. At the intersection with the DN13A national road, we turn left and reach Băile Homorod after 5 km. The leg is 21,7 km long, has an elevation gain / loss of 447 m / -453 m, a maximum slope of 17,9% / -21,3%, and an average slope of 3,6% / -4,1% (fig. 14).

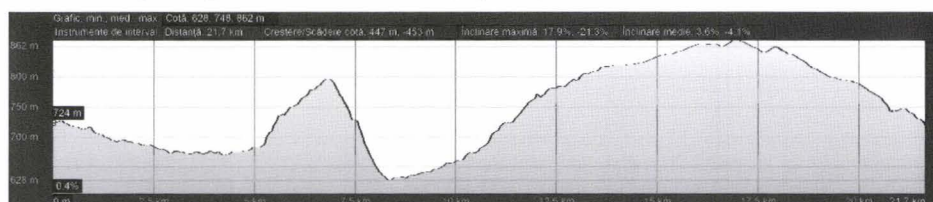


Fig. 14. 12th leg elevation profile

13th leg (Băile Homorod-Băile Perla Vlăhiței)

From Băile Homorod, we return to Vlăhița, from where a communal road in the centre of the village leads to Băile Perla Vlăhiței, 2 km away. The leg is 8,03 km long, has an elevation gain / loss of 200 m / -52,7 m, a maximum slope of 15,1% / -7,6%, and an average slope of 3,5% / -2,1% (fig. 15).

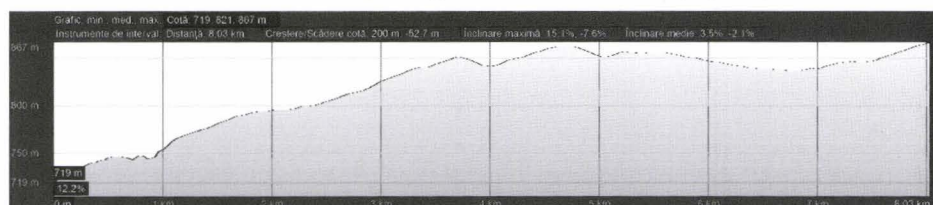


Fig. 15. 13th leg elevation profile

14th leg (Băile Perla Vlăhiței- Harghita-Băi)

From Băile Perla Vlăhiței, the route is following the Valea Vârghișului stream southwards until the DN13A national road, which it takes eastwards until the intersection with the DJ138A county road. We then climb northwards through the forest for approximately 8 km, reaching the picturesque spa of Harghita Băi. The leg is 19,2km long, has an elevation gain / loss of 645 m / -192 m, a maximum slope of 15% / -8,9%, and an average slope of 4,8% / -2,8% (fig. 16).



Fig. 16. 14th leg elevation profile

15th leg (Harghita-Băi-Miercurea Ciuc)

The last leg of the route crosses the Harghita Mountains over the Vlăhița Pass back to the Ciuc Depression. From Băile Harghita, we descend on the DJ138 county road and turn east at the intersection with the DN13A national road until Miercurea Ciuc, where the bike route can be concluded in the wide Central Square. The leg is 20,4 km long, has an elevation gain / loss of 97,7 m / -752 m, a maximum slope of 8,1% / -15,2%, and an average slope of 1,6% / -4,6% (fig. 17).

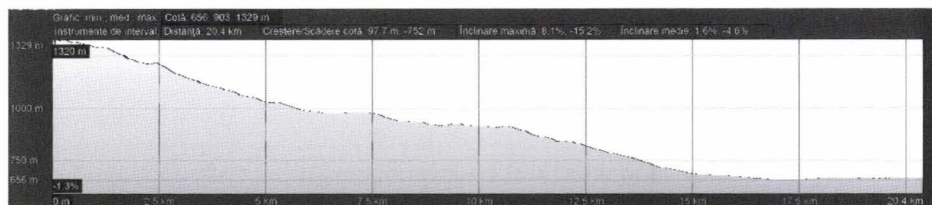


Fig. 17. 15th leg elevation profile

Conclusions

Even if there is no dedicated infrastructure for this bicycle route, it can be accomplished with a reasonable biking equipment and training, assuming good weather conditions. The main problem that can occur are the dangers presented by cars on the sections covered by national roads (and, to a lesser extent, the county roads), which is why a dedicated bicycle infrastructure is needed were this route to be implemented. However, a first step towards its creation would be a proper marking along the way, so that even less experienced riders can find all the mineral springs presented in this paper. Further info panels at these points, as well as connected facilities (resting places, bad weather shelters) would greatly contribute to its successful implementation.

Rezumat. Așezați în partea sud-vestică a grupeii centrale a Carpaților Orientali, Munții Harghita (1800 m în vf. Harghita-Mădăraș) reprezintă de asemenea grupa cea mai sudică a munților care compun lanțul vulcanic al Carpaților Orientali. Tocmai această origine vulcanică face ca aici să se găsească cea mai mare densitate de izvoare minerale și alte fenomene post-vulcanice din întregul sector estic al Carpaților. Din cele peste 400 de izvoare minerale, proporția cea mai mare (34,7%) revine apelor bicarbonat-carbogazoase. Pe lângă sursele cu debit bogat, ca de exemplu cele de Băile Tușnad (7,18 l/s), care sunt folosite în proceduri terapeutice diverse (dar totuși la doar 25% din capacitate), există o serie de izvoare cu debit mai mic, utilizate local, dar dintre care multe au o infrastructură degradată, și doar punctual (Băile Madicea, de exemplu) există semne de remediere a acestei situații. Pentru a (re)aduce în atenție aceste locații, propunem acest circuit de două zile a acestor izvoare-băi de ape minerale, care înconjoară jumătatea sudică a Munților Harghita, plecând de la Izvorul Mureșului și coborând spre sud, pe diverse drumuri (naționale, județene, comunale,

forestiere, cărări) până la Băile Tușnad (punctul terminus al primei zile), de unde ruta pornește spre est, peste Munții Perșani, pentru a continua spre nord și apoi est, peste Pasul Vlăhița, ajungând în cele din urmă în Miercurea Ciuc, unde se încheie cea de a doua zi. Traseul este împărțit în 15 etape (8 în prima zi, 7 în cea de a doua) de lungimi și dificultăți diferite, care leagă între ele următoarele locații: Băile Madicea, Băile Dugaș, Băile Racu, Băile Miercurea Ciuc, Băile Jigodin, Sântimbru-Băi, Băile Nadaș, Băile Tușnad, Ozunca-Băi, Băile Selters, Băile Chirui, Băile Homorod, Băile Perla Vlăhiței, Harghita-Băi. Problema cea mai mare a acestui traseu este reprezentată de porțiunile de drumuri naționale, unde pericolul de accidente este ridicat, fapt pentru care se impune o infrastructură dedicată, care să cuprindă pe lângă calea de rulare propriu-zisă și marcaje, indicatoare, panouri informative, locuri de popas și de refugiu.

REFERENCES:

- ALFF, D., 2013, The Essential Guide to Touring Bicycles, third online edition, Create Space Independent Publishing Platform, 73 p.
- CIANGĂ, N., 1998, Turismul din Carpații Orientali, Studiu de geografie umană, Presa Universitară Clujeană, Cluj-Napoca, 283 p.
- SCHREIBER, W., 1994, Munții Harghita, studio geomorfologic, Editura Academiei Române, București, 134 p.
- <https://maps-for-free.com/> and an excerpt from the Geological Map of Romania 1:200.000
- <http://www.geo-spatial.org/download/harta-geologica-a-romaniei-scara-1-200-000>)
- <http://geoportal.ancpi.ro/geoportal/viewer/index.html>

CULTURAL VALUE OF MOUNTAIN PEAKS FROM ROMANIAN CARPATHIANS

Ioan BÎCA*

Abstract. Certain areas and peaks of the Romanian Carpathians are loaded with spiritual connotations that surround legends. This cultural heritage is an asset of attractive potential, but is little known by mountaineers because authorities having jurisdiction in those mountain areas not attach importance to interpreting and valuing cultural dimensions of these places. The present study emphasize the cultural value of some representative peaks of the Romanian Carpathians, to link it with their reputation reflected in mountaineering flows.

Key words: mountains cultural heritage, cultural interpretation, mountain tourism.

Introduction

Last years, mountaineering in Romania has increased, going from being a niche to mainstream status. The causes that have contributed to this phenomenon are the following:

- change the labor structure and increased leisure time;
- the progress of the mountain equipment (boots, clothes, accessories);
- access to information on the Internet (websites, videos, photos) and TV;
- the development of social networks (especially Facebook);
- increase in the number of travel agencies mountain, which operates online;
- fast moving possibility in mountainous areas.

In this context, the mountainous areas of Romania became veritable tourist destinations, beset by numerous mountaineers practicing recreation activities such as: hiking, mountainbiking, paragliding, scrambling, climbing, alpine skiing, ski touring, off-piste skiing etc. The motivation for these practices is varied: relaxation, adventure, maintaining and improving fitness, health, sports performance, personal development etc.

For those who practice mountain hiking, ultimate goal is to reach the peak, especially those over 2000 m, because it represents a major challenge. The factors that matters for this approach are: elevation and configuration of the peak (sharp, rounded, pyramidal, conical), aesthetic meaning of the peak, prominence (difference in height between the base and its top), reputation in the mountaineering community, and cultural value, supported by myths and legends.

* Babeș-Bolyai University Cluj-Napoca, Faculty of Geography, corresponding author:
john_grimo@yahoo.com

It is well known that certain mountainous areas of the world is characterized by a sacred dimension, shaped by historically, that polarizes the spiritual life of certain communities. We can mention here: Mount Olympus, the abode of the gods (Greece), Mount Kailash, a place of pilgrimage for millions of Hindus and Buddhists (Tibet, China), Mount Sinai, where Moses received the Tablets of the Law (Egypt), Mount Etna-house of god Vulcan (Italy), Mount Fuji-pilgrimage for Buddhist and Shinto, gate to another world (Japan), Mount Agung-center of the universe (Bali), Mount Nebo, from where Moses saw the promised land of God (Jordan), Mount Gugu-holy and sacred mountain of Dacians (Romania), Mount Shasta, where live Skele-the spirit above the world (tribe Klamath, USA), Mount Ararat, where stopped Noah's Ark after the Flood (Turkey), Mount Teide, the place where was closed the devil Guayota, by Magec, god of light (Guanches tribe, Canary Islands), etc.

According to Taoist beliefs, mountains are the place where humanity communicates with Earth's primordial powers. Therefore, from the mountains flowing rivers of energy that people are looking to be reborn physically and spiritually. Nowadays, mountains, besides economic importance (wood, minerals, rivers, stone), continue to be mainstreamed in social activities and spirituality, being places for pilgrimage, popular holidays, relaxation, meditation, charging energy, inspiration art (photography, music, painting), and sport activities (mountain marathons, rock and ice climbing, hiking etc.).

In Romania, the mountains are the symbol of continuity of population in this place of geographical convergence, as confirmed by intense humanization of space mountain and spiritual meanings attributed to certain mountains. It's about Bucegi Plateau-Dacian sanctuary and energetic spot, Gugu-Dacian sacred mountain, Ceahlau-Holy mountain of Moldova, Călimani-Feast of Elders etc. It is believed that in these places working a huge vortex, that are vibrational infusions, some initiated considering it the best place to achieve higher states of consciousness.

Given these considerations, the present study aims to highlight the cultural dimension of the main peaks of the Romanian Carpathians and to correlate with the degree of their popularity.

Materials and methodes

To achieve this study, were several methodological stages:

1) consulting some geographical works relating to Romanian Carpathians landforms (Geografia României, 1987);

2) consulting of Tourist information websites, on promoting mountain areas and leisure activities carried out in the Carpathian area:

<https://sites.google.com/site/romaniananatura>; <http://alpinet.org/>;

3) consulting of works devoted to the cultural dimension of mountain space (Carr, 2004; Blake, 2005; Bernbaum, 2006); Europe's ecological

backbone: recognising the true value of our mountains, EEA Report No 6/2010ISSN 1725-9177);

4) reading of Romanian geographical legends:

- Brill, 1974; Coatu, 1986;

<http://cnipturicani.ro/legendele-noastre>;

<https://adevarul.ro/locale/ploiesti/legenda-vrajitorului-caraiman-dat-numele-unui-varf-montan-s-a-transformat-piatra-copiii-incercat-sa-i-fure-cimpoiul-fermecat>;

<https://www.slideshare.net/BULGARAS/legende-geografice-romanesti>);

<https://www.departamentulalphacarpatica.ro/legenda-lui-omu/>;

http://www.ceahlau.neamt.ro/legenda_varfului_toaca.php;

<https://adevarul.ro/locale/piatra-neamt/de-vine-numele-toaca-dat-varfului-ceahlau-mitul-uriasilor-trait-munte-avut-sfarsit-tragic>;

<https://muntii-fagaras.ro/legenda-varf-moldoveanu>;

<https://cultural.bzi.ro/legende-muntelui-retezat>;

<http://www.emunte.ro/muntele-gugu-fenomene-mistice-si-legende-din-vremea-dacilor/>;

<https://adevarul.ro/cultura/istorie/varful-frumoasa>;

<https://mythologica.ro/muntii-sacri-in-istoria-popoarelor/>

5) collection of field data, related to configuration and protrusion of mountain peaks, and tourist flows.

6) consulting some cartographic materials about Carpathian Mountains:

https://www.welcometoromania.ro/Romania/Romania_Harta_Geografica_r.htm).

Study area

Romanian Carpathians is a subdivision of the Carpathians Mountains, which runs between Vienna Basin and Timok Valley (figure 1). In terms of altitude, Romanian Carpathians are part of low mountains (617 m, Poetsi peak, Dognecea Mountains, Banat Mountains, Western Carpathians), and medium mountains (2544 m., Moldoveanu peak, Făgăraș Mountains, Southern Carpathians).

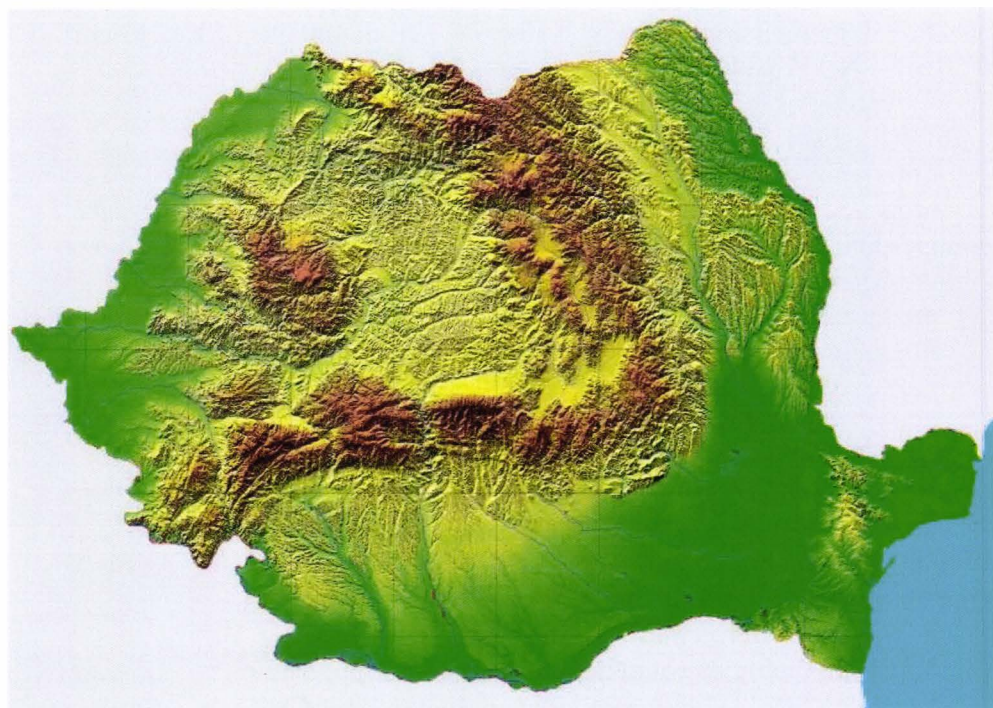


Fig. 1. The Romanian Carpathians

(source: https://www.welcometoromania.ro/Romania/Romania_Harta_Geografica_r.htm)

Erosional processes fragmented mountain area into numerous massives, where there are several peaks, which are hotspots for mountaineers. For example, Farcău (1957 m) and Mihailec (1918 m) in the Maramureș Mountains, Pietrosul Mare (2303 m) in Rodna Mountains, Pietrosul Călimani (2100 m) in Călimani Mountains, Toaca (1900 m) in Ceahlău Mountains, Omu (2505 m) in Bucegi Mountains, Moldoveanu (2544 m) in Făgăraș Mountains, Parângu Mare (2517 m) in Parâng Mountains, Peleaga (2509 m) in Retezat Mountains etc.

These peaks are characterized by certain morphometric parameters (elevation, prominence) and morphographic parameters (shape), but also cultural meanings, once the legend, myth and historical events. Roman historian Lucius Annaeus Florus claimed "Daci montibus inhaerent", meaning "Dacian people lives in the mountains", which shows a close relationship between the local population and the Carpathians. Therefore, our ancestors humanized mountains of ancient times, and have interpreted the landscape, whether it was about peaks, ridges, valleys and rock formations in order to create a favorable habitat. Carpathian Mountains were held for grazing, shelter in times of plague and scene of sacred representations, where residents communicate with their deities.

Results and discussions

The peaks chosen for the study are geo-morphological structures that are noticed on the mountain peaks or plateaus by certain parameters, such as:

- absolute elevation: over 1900 m;
- level difference to the adjacent surfaces: over 30 m;
- shape: conical, pyramidal, rounded, beveled, irregular, rough.

Their cultural dimension is supported by some legends, which increases their attractive potential. These peaks are the following:

1) Caraiman (2384 m)

- mountain massif: Bucegi, Southern Carpathians;
- name meaning: cara=black; imam=leader;
- the legend: Caraiman was a good witch whom his children tried to steal bagpipes blowing to green the nature. Pain, old man hardened, with bagpipes that still keeps him under his protector arm;
- the fame: the peak is very famous because the Heroes Cross of First World War located here, above Bușteni Resort;

2) Pietra Iorgovanului (2014 m)

- mountain massif: Retezat, Southern Carpathians;
- the legend: Iovan Iorgovan was a brave who cut several heads of the dragon that steal girls from villages at the foot of Retezat, during the reign of White King;
- the fame: the peak is a regular attraction for hikers;

3) Omu (2505)

- mountain massif: Bucegi, Southern Carpathians;
- the legend: Omu was a soldier who watched Dacian territory and was transformed, at the end of life, as a reward, by Time in a mountaintop, to watching the places forever;
- the fame: the peak is very famous for its Meteo Station and Tourist Shelter;

4) Toaca (1900 m)

- mountain massif: Ceahlău, Eastern Carpathians;
- the legend: Toaca was the area where locals have placed a chopped in memory of the two giants (one girl and one boy) who died on the mountain, trying to raise two towers to look for away;
- the fame: the peak is very famous for its height and scenic view, for its dawn summer pyramid, and for its meteo relays;

5) Moldoveanu (2544 m)

- mountain massif: Făgăraș, Southern Carpathians;
- the legend: the peak was named after the nickname of the shepherd which it leased back one hundred years ago, when these mountains were climbing only by shepherds;

- the fame: the peak is very famous because it is considered the roof of Romanian Carpathians, and of Romania;

6) Retezat (2485 m)

- mountain massif: Retezat, Southern Carpathians;
- the legend: a sturdy killed ogre who lived on the mountain and severed head, when it was turned into a large stone "headless" (Retezat peak), and left hand fell among the mountains and turned to water: his hand turned to Bucura Lake, and his fingers turned to Slăvei, Lia, Ana, Viorica, and Zănoaga Lakes;
- the peak was cut by Rusca, ogre girl who threw to her brother, who was the top, an iron plow;
- the fame: the peak is a regular attraction for hikers;

7) Peleaga (2509 m)

- mountain massif: Retezat, Southern Carpathians;
- the legend: here, around Peleaga peak, has lived prehistoric Pelasg and his people;
- the fame: the peak is very famous, because its height and scenic views;

8) Gugu (2292 m)

- mountain massif: Godeanu, Southern Carpathians;
- the legend: Gugu was the site of holy and sacred mountain of Dacians people, where priest Deceneu lived as a hermit, in a cave;
- the fame: the peak is a regular attraction for hikers;

9) Frumoasa (2168 m)

- mountain massif: Cindrel, Southern Carpathians;
- the legend: a beautiful daughter of Sebeș, rose to a celebration, up on the mountain of Cindrea Shepherd;
- the fame: the peak is a regular attraction for hikers;

10) Șureanu (2095 m)

- mountain massif: Șureanu, Southern Carpathians;
- the legend: vârful reprezintă unul dintre capetele monstrului Briareus (Aigaion) sau Cottus, care avea 50 de capete și 100 de brațe;
- the peak represent one of the heads of the Briareus (Aigaion) monster, or Cottus monster, that have fifty heads, and hundred arms;
- the fame: the peak is a regular attraction for hikers;

These mountain peaks are included in tourist circuits, but their cultural heritage is partly known by mountaineers, although they are notorious destinations for hiking, both in summer and winter.

From field observations, it was found that their legends are not translated on the information pannels to be learned by the ignorant people, and that is because management of interpretation of cultural landscape in the Romanian Carpathian area is underdeveloped, although some of the peaks in question are part of national parks (Caraiman Omu, Chop, Retezat Peleaga).

Therefore, the communication of cultural values that characterize a mountain or a peak is poor, and this is evident from interviews with various mountaineers who were questioned about the purpose of their visit to the mountain.

The responses were as follows: 80% recreation and scenery, 15% sporting performances, and 5% knowledge legendary places. All respondents have agreed that the cultural heritage of mountains and peaks should be promoted through specific actions, such as the installation of information pannels(on the route, on the summit), organization of thematic guided tours, and developing promotional leaflets.

Conclusions

Romanian Carpathian area is characterized by numerous cultural and spiritual meanings, which reflects on its attractive potential. This should be an important reason for preserving the landscape, to preserve the traditions, for tourism planning, and to exploitation by cultural and educational activities.

Peaks, as geomorphological structures, are shrouded in legend, and attract visitors, contributing to the shaping of mountain pilgrimages, whit impact on the local economy and the environment (ex. Bucegi Ceahlău Sureanu Rarău Retezat etc.).

It would be appropriate, as the peaks of cultural value to be marked with information boards, wich must contain legends and associated myths, and to be included in thematic hiking trails. The actors involved in this project could be: county and local administrative authorities, tourist information centers, national/natural parks administration, tourism associations and local action groups (LAG).

Rezumat. Anumite areale și vârfuri din Carpații Românești sunt încărcate de conotații spirituale datorită legendelor care le învâluie. Această moștenire culturală constituie un atu al potențialului atractiv, dar este prea puțin cunoscută de muntenari, deoarece autoritățile care au jurisdicție în arealele montane respective nu acordă importanță interpretării și valorificării dimensiunilor culturale ale acestor locuri. Studiul de față scoate în evidență valoarea culturală a unor vârfuri reprezentative din Carpații Românești, legându-le reputația de fluxurile turistice.

REFERENCES:

- BERNBAUM, E., 2006, Sacred Mountains: Themes and Teachings, Mountain Research and Development, 26(4):304-309.
- BLAKE, K.S., 2005, Mountain symbolism and geographical imaginations. cultural geographies, SAGE Publications, 12 (4), pp.527-531.
- BRILL, T., 1974, Legende geografice românești, Editura pentru Turism, Colecția: Locuri și legende, București.

- CARR, A., 2004, Mountain Places, Cultural Spaces: The Interpretation of Culturally Significant Landscapes, *Journal of sustainable tourism*, vol. 12, No. 5.
- COATU, N., 1986, *Legende populare geografice*, Ed. Sport-Turism, București.
- *** *Geografia României*, vol. III, *Carpații Românești și Depresiunea Transilvaniei*, Ed. Academiei RSR, 1987.
- *** <https://sites.google.com/site/romaniananatura>;
- *** <http://alpinet.org/>;
- *** <http://cnipturicani.ro/legende-noastre>;
- *** <https://adevarul.ro/locale/ploiesti/legenda-vrajitorului-caraiman-dat-numele-unui-varf-montan-s-a-transformat-piatra-copiii-incercat-sa-i-fure-cimpoiul-fermecat>;
- *** <https://www.slideshare.net/BULGARAS/legende-geografice-romanesti>);
- *** <https://www.departamentulalphacarpatica.ro/legenda-lui-omu/>;
- *** http://www.ceahlau.neamt.ro/legenda_varfului_toaca.php;
- *** <https://adevarul.ro/locale/piatra-neamt/de-vine-numele-toaca-dat-varfului-ceahlau-mitul-uriasilor-trait-munte-avut-sfarsit-tragic>;
- *** <https://muntii-fagaras.ro/legenda-varf-moldoveanu>;
- *** <https://cultural.bzi.ro/legende-muntelui-retezat>;
- *** <http://www.emunte.ro/muntele-gugu-fenomene-mistice-si-legende-din-vremea-dacilor/>
- *** <https://adevarul.ro/cultura/istorie/varful-frumoasa>
1_51adb83c7b855ff5657a5a8/index.html;
- *** <https://mythologica.ro/muntii-sacri-in-istoria-popoarelor/>
- *** https://www.welcometoromania.ro/Romania/Romania_Harta_Geografica_r.htm
- *** *Europe's ecological backbone: recognising the true value of our mountains*, EEA Report No 6/2010 ISSN 1725-9177.

INDUSTRIAL GROUPINGS AND SETTLEMENTS. UNITS AND STRUCTURES IN THE FORM OF GEOGRAPHICAL AXES

Călin Cornel POP*, Cătălin Daniel POP**, Cerasela SĂPLĂCAN*,
Cecilia PINTEA*

Abstract. The conception of unitary system of settlements reaffirms from the structural point of view the necessity of urban systems as dynamic integral formations of different sized settlements being conditioned in territory by functional links and the base of economic community realizing in this way a hierarchical subordination from the administrative and social economic point of view. Being the component of space, of network of settlements and of national economic system, the village represents the synthesis of territorial, demographic and functional elements. Between all this, the function is the one that express the most directly the link between the local system (township, village) and the social territorial frame, through the objectives that are being realized: the economic order, which means to produce, to gather and to realize exchanges of goods; the territorial order, objective through which are being generated certain convergent zones and a redistribution of goods, it stimulates the general development of a settlement and even of a given territory, nearer or further, it promotes certain functions which finally give the framework and the morphological characteristics of the settlement. Territorial associations of centers between which is carried out intense production links, industrial groupings express the best, as taxonomic units, realities of the territorial allocation process of the Romanian industry at the contemporary stage. Industrial groupings represent high concentration nodes of industrial production, a well-enclosed industrial network, forming together with the other taxonomic units, the national industrial system. Industrial groupings can be genetically classified, morphological (mono- and multi-polar) and functional. The genesis of these concentrations can be traced over time, depending on several factors.

Key words: geographical axes, urban settlements, rural settlements, industrial groupings.

1. Introduction

The geographical axes can be defined as a line of spatial-temporal force allowing in a temporal-spatial manner the geographical diagnosis and prognosis of a territory that can take different geometric conformations and sizes according to the capacity of component polarization (Pop, 2016).

* “Babeș-Bolyai” University, Faculty of Geography, 400006 Cluj-Napoca-Romania, e-mail: cccpop@geografie.ubbcluj.ro, e-mail: calin_c_pop@yahoo.com

** “Babeș-Bolyai” University, Faculty of Law, 11 Avram Iancu Str., 400089, Cluj-Napoca, Romania

The geographical axes consist of elements and the way they behave reflects the operating conditions (Pop, 2013). The operation links in a unified complex the ensemble of the aspects that act on these types of structures integrating them to their natural environment, the historical background and relations, offering them the means with which they can accommodate to the higher complex (region, country, continent) and can integrate the lower complexes (settlements, industrial groupings) (Pop, 2004). In a geographical axis the relations are diverse, complex and perform material, energetic, informational and relational functions. The relations stand as subject to permanent, temporary and random factors, which also influences and directs them. The relationships are of a synergistic, coevolutionary and mutual support type. Reflecting the relations, it results at different times varying fragility, degradation, stability or regressive conditions (Pop, 2005, 2007). Regarded as territorial structures the geographical axes fulfill, offer and carry at least three of the characteristics of the smart structures namely: the geographical axes are ordered structures; the geographical axes are coherent structures; the geographical axes are organizational structures.

1. Urban Settlements

The conception of unitary system of settlements reaffirms from the structural point of view the necessity of urban systems as dynamic integral formations of different sized settlements being conditioned in territory by functional links and the base of economic community realizing in this way a hierarchical subordination from the administrative and social economic point of view. The binding factor that confers entirety, therefore a systematic character to groups of settlements is, beside the production links, the social infrastructure, which means in that sphere the material and spiritual necessities of urban population lifestyle are satisfied. In this mode in every zone of the country the access of population to services with urban character is being made in the limits of a distance of maximum 15-20 km. Based on the size and the character of the functions of cities a hierarchical range of systems from the simple local ones to whole complex systems is being formed. The vast majority of present and future small cities become local elementary system centers by grouping around several rural settlements. The economic base of these systems is a single production branch with auxiliary undergrowth such as the industrial processing of agricultural products from the gravity zone. Other entry level systems are formed on the basis of spa functions. The integral complex systems are being formed on the base of the elemental ones with generator centers such as big and middle cities with complex functions at interregional and regional level (Filip, 2009). The Integrative links of these systems are achieved through the medium of a range of hierarchically subordinated cities of different sizes. Within these systems, the small cities get complementary functions to the main city. Through

the development of small industry or of sections and branches of big enterprises from the main center a multiple efficiency can be obtained: using labor force locally, avoiding extensive development of industry in big centers. On this line the big cities become a stimulation factor of activities of small cities, the small city becoming a true partner of the big city in the ascendant process of erasing the differences between the urban environment and the rural environment (Geografia României, Geografia Așezărilor, p. 153).

The characteristics of social economic categories of cities, after *The Houses and Population Census from 5 January 1977*, vol II, DCS, 1980 (Geografia României, Geografia Așezărilor, vol. II, p. 165) (Table 1).

Table 1

The role in social economic hierarchy	The size (number of inhabitants)
City as metropolis	
“Growth poles” centers	100 000 – 300 000
Steady cities	
• medium-sized superior	50 000 – 100 000
• medium-sized lower	20 000 – 50 000
Regional attraction centers	
• medium-sized lower	20 000 – 50 000
• small	sub 20 000
Local influence centers	sub 20 000

The main functional structural types of cities in 1992. The type of city: Polyfunctional cities (administrative residences); Predominantly industrial cities; Transport centers cities; Transitional cities between industrial, transport and non-industrial centers; Cities with agricultural profile, with local influence; spa resorts and recreational cities (Geografia României, Geografia Așezărilor, vol.II, p. 166). Besides the central position in national urban system, the Bucharest municipality concomitant owns a metropolitan area, in which particularly intense relationships on the material production and labor force line are being realized. Nodal centers are considered “Growth poles” cities due to their higher initial potential than other cities, that acts as a multiplier factor on increasing population and industrial potential. Distributed in rationally mode in territory, “growth poles” centers are being characterized through a strong and complex industrial development, an ample network of institutions and organizations of regional importance (scientific design and research institutes, construction specialized trusts, higher education institutions, art and culture units, publishing houses etc. (Geografia României, Geografia Așezărilor, vol. II, p. 166).

2. Rural Settlements

Being the component of space, of network of settlements and of national economic system, the village represents the synthesis of territorial,

demographic and functional elements. Between all this, the function is the one that express the most directly the link between the local system (township, village) and the social territorial frame, through the objectives that are being realized: the economic order, which means to produce, to gather and to realize exchanges of goods; the territorial order, objective through which are being generated certain convergent zones and a redistribution of goods, it stimulates the general development of a settlement and even of a given territory, nearer or further, it promotes certain functions which finally give the framework and the morphological characteristics of the settlement. (Geografia României, Geografia Așezărilor, vol. II, p. 186).

The dispersion of settlements. The disposition phenomenon of human settlements in territory refers in the first place to the spatial reports between them. Whether this phenomenon was called *dispersion* (dispersal degree), whether it was called *concentration* (concentration degree), it reflects the mode in which towns are dispersed or grouped in a territory, factors that characterize this spatial aspect being represented by the distances between the bordering towns, the surrounding area deprived of towns, the size of the settlement hearth. The knowledge of the degree of dispersion of human settlements highlights two main aspects: the possibilities of procuring resources needed to develop the respective towns, in the present and in the future – foodstuffs, raw materials and industrial products, labor force etc.; the achievement conditions based on current and perspective requirements, on product and passenger transports in surrounding region or in more distant regions (here are being considering also the seasonal or the diurnal movements of labor force). (Geografia României, Geografia Așezărilor, vol.II, p. 198).

There was a tight link between the social and economic requirements and the natural framework represented by landscape, water resources, possibilities of agricultural use or of exploitation of soil and subsoil riches. Because of this, dispersion, reflecting one aspect of the evolution and one of the social economic structure of settlements, appears under the form of groups, in which it prevails a certain value and in which it reflects the tight relationship with social economic conditions and with natural ones. On this line, on the territory of Romania five large categories are highlighted: *very high dispersion areas of settlements*, in which the dispersion index exceeds the value of 50, encompasses a large number of settlements, especially in the Danube Delta and in the mountain area; *insular*, may appear in Bărăgan and Dobrogea. The feature is given by large distances between human settlements, which are generally small settlements, with an economy influenced by natural conditions, *large dispersion areas*, with dispersion index values ranging from 40 to 50, expanded more in Bărăgan and in Dobrogea, and *insular* in the Oltenia plain and Banato-Crișana plain. Distances are maintained here at significant values and settlements are generally large and with predominantly agricultural functional characters;

moderate dispersion areas, where the dispersion index registers values ranging from 20 to 40, it occupies most of the Romanian plain, the Banato-Crișana Plain and a part of the Transylvanian Plateau; the settlements are large and are having predominant agricultural characters; *low dispersion areas*, delimited by values of 10-20 of the dispersion index, where settlements are located, in generally, at not too large distances from each other, having various activities. These areas are mainly located in the Subcarpathian area and in the high hill area of the plateau of Moldova, of Transylvanian Plateau and in the wider extramontane deformations; *very small dispersion areas*, with narrower stretching, appear by more insular-looking groupings in the Subcarpathian area, in the Central Moldavian plateau, in the central part of the Transylvanian Plateau and in intra-and extramontane lower deformations. The values of the index of this category are located below 10, the settlements are having quite different functional characters, from agricultural to complex ones. The above categories provide an overview of the characteristics of dispersion in certain territories, highlighting the relationships that human settlements have with social-economic and natural conditions, while providing indications concerning territorial and functional characteristics of settlements at how to use the space. (Geografia României, Geografia Așezărilor, vol. II, p. 199-200).

3. Industrial Groupings

Territorial associations of centers between which is carried out intense production links, industrial groupings express the best, as taxonomic units, realities of the territorial allocation process of the Romanian industry at the contemporary stage. Industrial groupings represent high concentration nodes of industrial production, a well-enclosed industrial network, forming together with the other taxonomic units, the national industrial system. Industrial groupings can be genetically classified, morphological (mono- and multi-polar) and functional. The genesis of these concentrations can be traced over time, depending on several factors. Thus, the worth of some raw materials (petroleum, methane gas, coal, iron ore, salt, building materials, non-ferrous ores, wood etc.) has had and currently has a significant role in the attraction of industrial sites, in shaping some groupings – as the old ones are (Reșița, Hunedoara, Baia Mare, Petroșani) and the new ones (Valea Trotușului, Târgu Jiu - Rovinari - Motru). Another important factor in the formation of industrial groupings is the one related to the attraction exercised by large urban centers on industrial production through the functions. It should be noted that other factors are frequently associated with urban ones, namely: the transports (maritime, fluvial, by railway) and craftsmen tradition, that ensures, in some areas, a higher qualification of the labor force. The analysis of development in the territory of these groupings shows the fact that some are *the concentric* type, in which the centers are developing around a core (Bucharest, Ploiești, Brașov,

Sibiu etc.), others are *linear*, along the transportation axes situated on valleys (Prahovei, Ialomiței, Trotușului, Bistriței, Târnavei Mari etc. (Geografia României, vol. II, Geografia Industriei, p. 306-307). There are, however, industrial groupings in which the urban factor is tight associated with the worth of methane gas, salt, petroleum, coal, building materials or other raw materials, as well as, the use of railway axes (Geografia României, vol. II, Geografia Industriei, p. 307-309). To turn to advantage the rich deposits of methane gas in Transylvanian Plateau created favorable conditions to emerge the chemical industry, to use the building materials and the salt, by boosting, at the same time the development of old craft industries (textiles, wood, metalworking etc.). These factors, together with the existence of modern rail axes: Sighișoara - Teiuș, Cluj Napoca - Câmpia Turzii - Teiuș - Vințu de Jos, contributed to the development of industry, to the construction of industrial groupings: Cluj Napoca - Turda - Ocna Mureș and the one in the Târnava Mare river valley. Between them appear some structural differences related to the specifics of functional evolution of urban centers, the degree of use of methane gas and other resources capitalized through it.

Cluj Napoca - Turda - Ocna Mureș grouping is characterized by the development of: machine building industry, chemical industry (chlorosodic products based on the exploitation of salt at Turdași, Ocna Mureș), construction materials industry, ferrous metallurgy industry, light industry etc. In the Cluj-Napoca center enterprises of the automotive industry, chemical industry and other branches are focused. The Câmpia Turzii center is specialized in ferrous metallurgy, Turda is specialized in the industry of construction materials and chemistry and Ocna Mureș is specialized in the chemical industry (Geografia României, vol. II, Geografia Industriei, p. 309).

The grouping in the River Târnava Mare Valley, being of linear type, is constituted by Sighișoara, Dumbrăveni, Mediaș, Copșa Mică and Blaj centers (Geografia României, vol. II, Geografia Industriei, p. 309).

Industrial grouping Ialomiței Valley has been shaped with relation to the strong industrial development of the municipality of Târgoviște (oil equipment, lathes, electrical engineering, metallurgy industry), to which the industrial centers from the upper valley of Ialomiței are joined: Doicești (electricity and building materials industry), Pucioasa (textile industry), Fieni (cement and electrical engineering industry). In the development of industry an important role played the rail transport (Geografia României, vol. II, Geografia Industriei, p. 309).

From the industrial groupings directly linked to the role of transport in the development of industry are making part: Galați - Brăila, Porțile de Fier, Constanța, Valea Prahovei groupings. The Galați-Brăila grouping, the most significant grouping of this type, is consisted by Galați, Brăila, Măcin, Chiscani and Vădeni centers. The river-maritime navigation, to which the presence of

- POP, C.C., 2013, Funcția structurală și sistemică a axelor geografice, Terra, volum al Societății de Geografie din România, București.
- POP, C.C., 2016, Axele geografice. Structuri teritoriale inteligente, Casa Cărții de Știință, Cluj-Napoca.
- XXX. Geografia României, vol. II, Ed. Academiei Române, București.

on the present action, but it is a sum, an accumulation of all the already undertaken, past actions (At). The future status of the geographical axes (Sv) will also depend on the present actions of this (Ap). Therefore, under the form of equations we have: $S_p = \sum A_t$; $S_v = S_p + \sum A_p$.

Rezumat. Concepția sistemului unitar de așezări reafirmă din punct de vedere structural necesitatea sistemelor urbane ca formațiuni integrale, dinamice de așezări de mărimi diferite, reciproc condiționate în teritoriu, prin legături funcționale și comunitatea bazei economice, realizându-se astfel o subordonare ierarhică din punct de vedere administrativ și social-economic. Component al spațiului, al rețelei de așezări și al sistemului economic național, satul reprezintă o sinteză de elemente teritoriale, demografice, funcționale. Între toate acestea, funcția este cea care exprimă cel mai direct legătura dintre sistemul local (comuna, satul) și cadrul social-teritorial, prin obiectivele pe care le realizează, respectiv cele: de ordin economic, adică de a produce, de a acumula și de a realiza schimburi de bunuri; de ordin teritorial, obiectiv prin care generează anumite zone de convergență și redistribuire a bunurilor, stimulează dezvoltarea generală a așezării și chiar a unui teritoriu dat, mai apropiat sau mai îndepărtat, promovează anumite funcții ce dau în final osatura și particularitățile morfologice ale așezării. Asocierile teritoriale de centre între care se desfășoară intense legături de producție, grupările industriale exprimă cel mai bine, ca unități taxonomice, realitățile procesului de repartizare teritorială a industriei românești în etapa actuală. Grupările industriale reprezintă noduri de mare concentrare a producției industriale, o rețea industrială bine încheagată, care formează împreună cu celelalte unități taxonomice sistemul industrial. Între ele apar unele deosebiri structurale, legate de specificul evoluției funcționale a centrelor urbane, de gradul de folosință a resurselor naturale și a altor tipuri de resurse.

REFERENCES:

- ALBRECHTS, L., TASAN-KOK, T. 2009, Corridor and Axis Development, International Encyclopedia of Human Geography, vol. 2 p. 298-304.
- FILIP, S., 2009, Planning Urban, Presa Universitară Clujeană, Cluj Napoca.
- IELENICZ, M., Comănescu, L., 2006, România, Potențial Turistic, Editura Universitară, București.
- IUREA, D., BRAGHINĂ, C., 2012, The role of development axes in Romania. Case Study: Iași County, Revista Română de Geografie Politică no. 1, pp. 61-77, Oradea.
- POP, C.C., 2004, Fenomenul de axă geografică. Aspecte teoretice, Geography within the context of contemporary development, S. C. F&F International SRL, Cluj-Napoca.
- POP, C.C., 2005, The integrated property in the geographical axis Jibou-Zalău-Simleu Silvaniei-Marghita, Studia UBB, nr. 1, Cluj Napoca.
- POP, C.C., 2007, The human concentration axis in the Sălaj County and the Durable Development, Rural Space and Local Development, Presa Universitară Clujeană, Cluj Napoca.

Galați and Brăila urban centers is added, contributed greatly to the concentration of industrial production (Geografia României, vol. II, Geografia Industriei, p. 309).

In the *Porțile de Fier industrial grouping*, the role of river transport appears decisive, even if the exploitation of local and hydropower resources has contributed directly to the development of the industry (Geografia României, vol. II, Geografia Industriei, p. 310).

The Constanța industrial grouping it was generated by rail and maritime transport, which later became decisive in shaping the great objectives in Constanța area: the shipyard, Midia petrochemical platform. The construction of the Danube-Black Sea canal will boost the industry from a number of industrial centers existing along it (Cernavodă, Medgidia, Basarabi), which will become active river ports (Geografia României, vol. II, Geografia Industriei, p. 310).

Prahovei Valley industrial grouping is primarily created by the Ploiești-Brașov railway axis, which allowed the transport of raw materials and labor force, as well as the easy exploitation of some construction materials, wood (in the superior part of the valley), and oil (in the area of Câmpina). Câmpina and Azuga, industrial centres closely related to the railway, have a different profile, the one related to oil processing and oil equipment industry (Câmpina), of construction materials (Azuga, Comarnic), fine mechanics (Sinaia), paper (Bușteni), textiles, glass, food (Azuga) (Geografia României, vol. II, Geografia Industriei p. 310).

Another type of industrial grouping is the one connected almost exclusively to the exploitation on local materials, being represented by metallurgy groupings like Reșița, Hunedoara and Baia Mare, through the coal mining like Petroșani, Târgu Jiu-Rovinari-Motru, of exploitation and processing of timber like Suceava-Câmpulung or by industrial exploitation of bauxite and construction materials on Crișul Repede and Barcău valleys etc.

4. Conclusions

The geographical phenomenon is structured according to specific dimensions, which allow the systemic ordering for the factual geography, which thus will put new states, always different from the previous ones, but with proportional loads according to the material, energetic and informational potential from the system of origin or acceptance. The dimensions of the geographical axes (Iurea et Braghină, 2012), development axes (Albrechts et Tăsan-Kok, 2009) and touristic axes (Ielenicz et Comănescu, 2016) as systems are functions of the collecting and operation capacity of that system. Moreover, the axis disposes of other territorial charges such as history, demography, settlements, the social charge, education, politics, government, culture, religion, ethnicity, technics etc. The present state of the axis (Sp) does not depend only

