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THOUGHTS ON A CONCEPT OF LANGUAGE GEOGRAPHY

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Abstract: It is the goal of this article to highlight the relation between language and space from the geographical perspective. After a screening of the position of language in sciences and the involvement of geographers so far, selected spatial aspects of language are highlighted: languages as reflections of the spatial context of cultures, spatial spread and retreat of languages and the powers behind them, rise and fall of languages, the different relation of language functions (standard language, dialect; official language, military language, sacred language etc.) to space, the role of language for space-related identity, trade and educational languages and their processes of expansion and regression, the function of place names in relating man to space.

Keywords: cultural geography, language, linguistics, conceptual thoughts, culture, space, language functions, space-related identity, place names

1 INTRODUCTION

Language is a social phenomenon. As such, it has intrinsic space relation – if only because its speakers are spread over space. Besides, however, language is in many more ways related to space, which are rarely noted. In this paper, I want to highlight some important spatial aspects of language, and give in this way some reasons to consider, why geographers should not be more active in this field and establish a kind of language geography.

2 POSITION OF LANGUAGE IN SCIENCES

Geographers do not so much regard language. There is no explicit sub-discipline in analogy to the study of other cultural population characteristics like religion (‘religion geography’) or ethnic affiliation (‘ethnic geography’) – a sub-discipline that could be titled ‘language geography’ or ‘geolinguistics’.¹ This is certainly true for the German-speaking sphere. ‘Geolinguistics’ is indeed a field of studies in the Anglophone world as much as ‘géolinguistique’ is in the Francophone and ‘geolinguística’ in the Spanish. But they are

rather affiliated to linguistics or regarded as interdisciplinary fields with just few geographers engaged in them and far from covering all relations between language and linguistic communities on the one hand and space on the other. Their pendant in German-speaking linguistics is called ‘language geography’ (Sprachgeographie). This branch of linguistics, however, restricts itself on studying the spatial variation of words and pronunciations within a given language – so just on one out of the variety of spatial aspects of language (see, e.g., GoosSENS 1969, Göbel 1984, 1992, 2004).

Language is also a historical phenomenon. It is subject to temporal change and closely related to political conditions. This should attract also historians to be interested in spatial aspects of language and to contribute to it from their perspective. Some examples of this engagement are Cathie Carmichael (Barbour & Carmichael 2000), Gardt, Hass-Zumkehr & Roelcke 1999 or Kamusella 2009.

Finally also sociologists, representatives of a discipline closely related to human and cultural geography and originators of many theories applied also in geography could contribute an important part. Roland Girtler (1996 and many other works) is to be mentioned here as somebody who had been already very active in this respect.

This means that language geography could in the system of sciences position itself rather as a multidisciplinary research field, to which besides linguists, historians and sociologists especially geographers – as representatives of the basic space-related science – could contribute a lot (see Fig. 1).

3 SPACE-RELATED ASPECTS OF LANGUAGE

Which, then, are the geographical, space-related aspects of language? In which aspects can cultural geographers be especially interested?

3.1 Language reflects the spatial context of cultures

Language symbolises or codifies concepts by words and makes in this way our system of concepts, our categorisation of the world, our abstraction of the complex and incomprehensible reality, communicable (see Fig. 2).

Individual cultures and their languages categorise complex reality in different ways. The mode of categorisation and the preciseness of resolution depends on what is important for a certain culture: People living in snowy regions have several concepts of snow. Shepherds subdivide the concept of sheep by gender, age, visual appearance and even temporary location. Coffee drinker cultures like the Viennese divide coffee into various kinds. Automotive cultures have manifold notions of cars.

The words of a language codify all these concepts. Thus, languages indicate and express the different worldviews of cultures, which in turn depend on the natural environment in which a certain culture is embedded and on the economic interests, it has. Mediated by the concept system of a certain cultural community, to which a language refers, languages are space-related.

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Just to present an example in more detail: For traditional seafaring cultures like the dwellers of the Croatian coast, winds are not only an occasional weather phenomenon, but had and still have a strong impact on their daily life and economy. Wind directions and wind velocities were always important – very much so in times of sailing vessels, but also up to the present day. This made them developing concepts and accordingly words/names for all the various types of winds in their region. Bura is the word for the heavy cold and dry wind falling down the slopes of the coastal mountain range. It produces a gust that makes the soils of the islands salty and selects vegetation. It can – due to its force – also be a severe obstacle to sea and land traffic and made at least traditional settlements hiding away behind hills and ranges, where they were not as exposed to this wind. Burin is the word for a softer variant of the same wind blowing mainly in summer. Jugo (‘southerly wind’) is the word for the wind from the Southeast coming up along the Adriatic Sea accompanied by rain and humid air, often resulting in inundations. Maestral is the name for the fresh soft wind from the open sea breaking the heat of summer lunchtime hours, tramontana (‘across the mountain’) for the wind blowing across the Liburnian mountain range in the North of Kvarner Bay.

3.2 Language change, rise and fall of languages are space-related phenomena

Language is a historical phenomenon and always changing. Both rise and fall of languages as such as well as the internal modification of a language as long as it exists display many space-relations, as I will demonstrate.

3.2.1 Rise and fall of languages as such

The “birth” of a new language as well as the fading away of a language refer to political forces behind them. Usually a state or state-like formation with its educational and political instruments, sometimes also churches, have the power and facilities to establish new languages. Likewise, the loss of former support by a state or church may cause a language regress and finally disappear. Alternatively and additionally, also demographic and socio-economic processes like population decline, migration, the change of economic orientations (industrialisation, towards tourism) connected with the opening up of closed societies and growing mobility may be the reason. All these are space-related phenomena and traditional fields of geographers.

The retreat of languages has also typical spatial stages: They retreat to peripheral regions like mountains, peninsulas, islands and wetlands before disappearing completely (see Harmann 2002). A typical example is Bask, the oldest existing language in Europe. It was spread over large parts of the Iberian Peninsula and what is today France before it withdrew into the Pyrenees and its forelands. Since the 19th century it shows also there the typical stages of regression towards the extreme periphery.

For Latin all the stages of its rise and fall are well-known. Born as the local language of Rome and Latium, it grew with the rise of the Roman Empire as the political power behind it and became the official language of a global empire. When this empire split in 395 A.C. into a western and an eastern part, it lost first its political support with its normative power in the West and developed into various forms of Vulgar Latin, from where the later Romance languages emerged. The longer preservation of state power in the East resulted in a longer survival of Latin as a standard and official language. In the 8th century, however,
East Rome had lost any prospect to re-unify the former Roman Empire and replaced Latin by the autochthonous Greek as its official language. Latin survived still for some time in restricted functions, not unimportantly as the sacred language of the Roman-Catholic Church up to the Second Vatican Council in the early 1960s, but also a (nominal) official language of Poland up to its final partition in 1795 and of Hungary up to 1844. The longer preservation of Latin with these nations resulted in the use of Latin words up to the present day in contexts, in which other languages have already replaced them by their own words for long.

Space-related, i.e. geographical aspects of language in this context are not only areal spread and retreat, but also reference to political and ecclesiastical powers and institutions, whose interactions with space use to be a feature of political and religion geography, respectively.

The temporal character of languages is most obvious with constructed languages. The guiding ideas behind them are to create the ‘perfect’ language, not burdened by the mix of often logically not compatible influences of a long tradition, and to create a ‘neutral’ language, which is nobody’s mother tongue and privileges nobody. The only greater success was Esperanto, the creation of the Polish Jew and medical doctor Zamenhof, who lived in Białystok, a city in the Northeast of modern Poland with a strong ethnic and linguistic mixture at that time. This hints already at geographical space, its structure and external relations, as relevant for constructed languages. Moreover, also the reasons for a constructed language’s (relative) success and failure could be of interest for geographers.

3.2.2 Internal development of languages

As long as a language exists, it receives influences from the outside, i.e. from trade languages, from languages representing an innovation centre in some field of human activities (e.g., computer techniques, music, dining, clothing, architecture), from languages of political dominators and occupation forces, from languages in the neighbourhood, but also from minority languages in the language’s own sphere of dominance. All these are essentially space-related and geographical.

Language innovation occurs, however, not only due to external influences, but comes also from the interior of a language community; when, e.g., new words in the same language are created or existing words receive another meaning. Geographically relevant questions then arising are, where the innovation centre is and through which channels innovations diffuse to peripheries. Usually, innovation starts from urban centres or core regions and proceeds towards peripheries along traffic axes and reach peripheries with delay and less vigour. Linguistic islands offside the compact language area use to receive innovations later, only partly or not at all.

Language innovations are, by the way, good and relatively easily measurable indicators of cultural innovation processes and their spatial directions in general.

3.3 Language functions have their specific relations to space

3.3.1 Standard language versus dialect

A standard language as it is codified in dictionaries and grammar books and implemented by states or other political units refers mostly to a country or administrative subunit. It usually changes at country borders, while at the level of dialects a continuum
prevails. With dialects a very smooth spatial change prevails – due to the fact that they are much less subject to regulation and not taught in schools with their normative impact. They therefore reflect patterns of real social contacts, also across country borders. They are thus valuable tools to study linguistic diffusion processes. Geographers could use them as indicators for the diffusion of other cultural, social and economic phenomena.

Very geographical may also be the reason, why a certain dialect has been chosen as the substratum of a standard language. Is it the dialect of the core region, the capital region, the economically dominant region of a certain country? Is it the region with a good location in the transportation network, the region with the highest cultural and historical prestige, the region of the ‘main tribe’ of a nation, the region, in which the national idea originates or the region with the largest number of inhabitants?

3.3.2 Official language
Official language is a sensitive topic in countries with several languages and linguistic minorities. The reference area, in which a language can be applied officially, is defined in various ways: Austria, e.g., has several linguistic minorities, but only one language has official status all over the country. The official status of minority languages is confined to administrative subunits. In Switzerland and Belgium one of several official languages is exclusively official in a part of the country, while the others have no status there. In Ireland and Canada two languages have official status country-wide. In the United Kingdom and the United States no language is declared official, but English has in fact all the characteristics of the official language. This variety is due to different historical-political, social, economic and cultural situations, which can in their complexity and interrelatedness be explained by geographers.

3.3.3 Military language
Military languages in the sense of languages used in armies sometimes diverge in territorial reference from official languages. The Austro-Hungarian Army, e.g., used – with some minor exceptions – just German as the language of commands and official intercourse, although in the Austrian crownlands several languages had official status. Federal Communist Yugoslavia had three languages exclusively official in an entire federal republic and many more languages official either in autonomous provinces or in a group of communes, but just Serbo-Croatian or Croato-Serbian was the language of the federal army. Also in the Warsaw Pact and in Nato just one language enjoyed/enjoys the status of the official means of communication: Russian and English, respectively.

3.3.4 Ecclesiastical or sacred language
Ecclesiastical or sacred languages in the sense of languages used mainly or exclusively in the ecclesiastical sphere show specific modes of dispersion. They are not bound to countries, mostly also not to ethnic, national or social groups. A characteristic couple in this respect are Latin as the sacred language of the Roman Church and Old Ecclesiastical Slavonic, later Ecclesiastical Slavonic as the sacred language of Slavonic Orthodoxy. Similarly supranational, they developed quite in a different way: Latin emerged as the official language of an empire and was later perpetuated by this empire’s official church while the secular power had vanished. Ecclesiastical Slavonic had been developed
by the missionaries Cyrill and Method to be well-understood by the various Slavonic tribes, so for the purposes of mission, and was only later adopted by the Bulgarian Empire.

3.3.5 Trade language or educational language
With trade languages or educational languages in the sense of languages acquired in addition to a native language or mother tongue geographically interesting are especially patterns of spread, reasons for spread, current moves of expansion and retreat, their stratification into global, continental and regional languages. All these aspects depend not just on the linguistic qualities of a language, but even more on political and economic forces behind it as well as on its cultural prestige.

3.4 Language is bound to social strata
Societal strata speak language variants like the idiom of educated people, a working class variant, a variant spoken by the rural population. Also subcultures like students, sport fans, frequently develop their specific idioms. The extent of variation, however, depends on the social gradient within a society. While the vertical gradient within a society is a phenomenon rather to be investigated by sociologists, it has frequently also a spatial aspect – like it is with the distinction between urban and rural population speaking different idioms.

3.5 Language often supports national, ethnic and regional identity
Languages are often symbols of national, ethnic and regional identity. Most nations define themselves primarily by language. A standard language may precede the process of nation building like it was with German or Italian. But it may also follow an already existing national idea like it was with Romanian or develop parallel to the process of nation-building, for which Serbo-Croatian, Macedonian and most recently Bosnian and Montenegrin are cases in point.

Also for regions standard languages as well as dialects can be identity markers. A standard language serving as a main marker of regional identity is, e.g., Catalan. Germany’s, Austria’s or Italy’s regions with significant identities are, in contrast, often marked by dialects.

3.6 Minority languages and small standard languages illustrate the spatial relations of language most significantly
For minority languages and small standard languages it is not easy to persist in a globalising world. But they profit also from the widespread desire to preserve identities right under these conditions. Even declining languages expand in symbolic representation like on signposts and on maps. This refers, e.g., to Frisian in the northern Netherlands or Scottish-Gaelic in Scotland, which are symbolically represented in a much wider area than where they are actually spoken today.

Other examples in this context are the Valcanale in Italy styling itself a multicultural region by representing symbolically its four languages (Italian, Friulian, Slovene and German) even on traffic signs, Kashubia cultivating again a minority language not so different from Polish, the Saami regions in the North of Scandinavia reminding the visitor mainly by bi- and multilingual (in the dominant and sometimes in more than one Saami language) signposts of their existence, the Sorabians in Germany’s Saxonia and
Brandenburg symbolically well-represented even by street names and even the Brittons profiting in spite of France’s official civic nation policy from a bottom-up movement resulting in bilingual street names, e.g. in Rennes.

Regionally dominant languages receive further support to underline regional identities as it is with Catalan or Galego.

Phenomena like these are closely related to society, space and history and need a.o. also a geographical approach.

3.7 Place names

With place names it is obvious that they relate language to space. But from a cultural-geographical perspective this relation can be described more precisely by highlighting four mainstreams of this relation (see also JORDAN 2012).

Firstly, place names are keys to cultural and settlement history (of a certain region). They tell us something about the cultural, social and economic constitution of the name-giving community, allow conclusions on it. Every name is meaningful and has been assigned to a feature based on a certain motivation. The name lets us know, how the name givers have perceived their environment and what in it was remarkable for them. Place names are condensed narratives about the name-giving community, on its environment as well as on the relation between both of them.

Currently used names are frequently derived from older layers of the language spoken today or even from a different language spoken earlier at the same place. Place names have in this way also a function like fossils in biology (ILIEVSKI 1988): They allow reconstructing, which language was spoken at a certain place and time and who the community using this language was.

Secondly, place names mark one’s own territory. Place names attributed by a person or a human community to a certain feature (in toponomastics titled endonyms\(^3\)) mark symbolically like flags, coats of arms or logos geographical features regarded as being in possession of this person or community or at least as features, for which this person or community feels to be responsible. „These names refer to the land of which we are the owners, and to the mountain that fills our horizon, and the river from which we draw the water to irrigate our fields and the village or town in which we have been born and which we love above all others, and the county, country and states, in which we live out our communal lives.“ (COROMINES 1965, p. 7) Place names help in this way to mark territories, to refer the identity of a person or a community to a section of space, to turn space into place (WATT 2009, p. 21). This is achieved by presenting place names in public space or in publications (like on maps). A marking of this kind occurs on all organisational levels of human society and in all spatial scales starting from nameplates at the doors of our workplaces, continuing with signposts in front of villages and communes and ending up with signposts at country borders.

Thirdly, place names structure geographical space mentally by making space-related concepts communicable. This gets especially obvious with names of regions and cultural landscapes. They are always just mental constructs and there is nothing like a ‘region by nature’. Where Europe ends in the East, where the boundaries of a ‘Central Europe’ run is just the result of a convention. Landscape and regional concepts are mental constructs

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\(^3\) See Jordan 2011.
marked by a name. Only the name enables communication on it. And by communicating space-related concepts we structure space mentally.

It is true that some (even many) concepts of regions and landscapes are supported by administrative boundaries or natural barriers like mountain ranges or rivers, but others are indeed pure mental constructs – like Salzkammergut, Dalmatia [Dalmacija], Transylvania [Ardeal] or Silesia [Śląsk]. They are nevertheless rich in content, deeply rooted in the consciousness of its inhabitants as well as of the outside world. Some function also as tourism brands and are commercially used by enterprises, music groups and newspapers exploiting their prestige. Nobody would say that this region or landscape does not exist. But it exists in fact just by its name.

Fourthly, place names support the emotional relation between man and place. This is primarily true for persons familiar with the place, i.e. inhabitants; persons, who were born and socialised in a certain place, but left it later without losing their relation to it; or persons, who developed a relation to a certain place only later in their life (like frequent vacationers). When they use the name, hear or memorize it, all their imagination of this place develops in their mind – not only its visual appearance, but also the memories of persons, events, sounds and smells connected with this place.

This capacity of place names to support emotional relations between man and place can also be seen with emigrants to overseas in the colonial period, who frequently took the name of their home with them – as a last tie to their former home or to make the new place more familiar.

4 CONCLUSION

This contribution attempted to show that the relations of language to space are manifold. Language as a cultural population characteristic is therefore certainly an attractive object of geographical research. So far, however, geographers have not very much taken notice of it. It is true that geographical research needs also a profound knowledge in linguistics or intensive cooperation with linguists. But the transgression of boundaries between scientific disciplines is nothing unusual and makes it rather more likely to arrive at new and even exceptional findings than to graze just on one’s own fields.

Fig. 1. Language as a feature of sciences
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RURAL SPACE – FUNCTIONALITIES AND DEVELOPMENT STRATEGIES

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Abstract: The rural space integrates the primary and residential forms, strengthened by secondary and tertiary structures, in a strong relation with the productive potential of the environment. A very strong tendency of diversification and specialization was registered in the last year. Consequently new research branches emerged focusing on the dimensions and complexity of the economic activities, the evolution of the rural habitat, the changes emerging in the structure and functions of the rural space. The sub-branches of rural geography – land use, agricultural geography, geography of the rural habitat, rural tourism and the geography of the rural industrial activities – emphasize the zonal areas which require to be reassessed according to production capacities in relation to the factors of geographic favourability.

Keywords: rural territorial complex, rural habitat, rural landscape, agricultural landscape.

The interdisciplinarity, common characteristic of current sciences promotes in the geography domain a competitive thoroughness, expression of diversity of research methodology but also of territorial identity. This explains the objectivity of the geography subdivisions which have as a common denominator the quantitative and qualitative appreciation of geographic phenomena and their territorial integration. The geographic information, the natural and anthropic quality transfer refers to the forms of a continuous dynamics expressed in rural space balances and unbalances, in the surrounding stress. This is why the surrounding offer must be strictly supervised, in the sense of correct evaluation and management as a leading premise of durable development.

Among the geographic branches, the rural geography has registered remarkable progress, nationally as well as internationally, taking into consideration its practical valences, its designation to evolutively and dynamically accentuate the human/productive functions and their changes in the geographic scenery.

The rural, in present conception represents the integrate area of primary and residential shapes, amplified and having secondary and tertiary structures, closely correlated to the productive potential of surrounding factors.1

The rural geography equally analyses the physical-geographical complex, the rural communities with all the sociologic implications, the geo-productive functions (agriculture,
industry, forest economy, transports, tourism, etc.), their integration in the urban settlements. It uses own scientific research techniques in order to shape the synthesis on the complex and integrated rural space.

### 1. SUB-BRANCHES OF RURAL GEOGRAPHY

During the last years, in the system of geographic sciences there has been registered a profound tendency of diversification and specialization favored generally by the interdisciplinary character of the science, by the progress of natural sciences and of the technical ones, by the modernization of the methods and scientific research techniques. Taking into consideration the dimensions and complexity of diverse surrounding capacities, of human development, of rural habitat evolution and of economic activities, of rural regions economic base diversification, the rural geography also enlists as a science with evident thorough and specialization sub-branches. In our opinion, as to this end the following sub-branches of rural geography can be outlined: Geography of Land-use; Agrarian/agriculture Geography; Rural Tourism/Agrotourism; Geography of Rural Habitat; Rural Industry Geography (small and medium enterprises, local manufactures).

Max Derruau in his paper “Précis de géographie humaine” (Ed. Colin, Paris, 1979) distinguishes the sub-branches of rural geography and the classification of agrarian organizational forms, according to the economic organizational principles, to the agrarian productions, and in general, to the agrarian activities inserted to the natural components, in two sub-branches: agricultural geography and agrarian geography.

a.) **Land-use geography** analyses and cartographically circumscribes all types of land use in an evolutional way, based on land observance, on old topographical maps and on historical documents. Significant are the appreciations on the extension or regression of plough lands and respectively of specialized cultures, of natural meadows, of forestry, aquatic and special fond.

b.) **Agricultural Geography and Agrarian Geography.** The geography economists distinguish more and more the agricultural geography concept from the agrarian geography one. The first concept credits the idea that the object of agricultural geography is the technical -agricultural conditions in correlation with the results of agricultural activities. It studies the quantitative aspects of allotment, volume and production commercialization (D. Faucher, 1962). The agrarian geography refers to the territorial arrangements depending on the physical-geographic and human conditions on territorial profile².

In close connection to these sub-branches of rural geography, according to the scientific opinion concerning the agricultural usage of land, many terms are used, as follows: agrarian landscape, rural landscape, agro-geographic region, agro-ecosystem, and others. The term agrarian landscape can be conceptualized in a semantic and theoretic-scientific sense. The first sense denominates the whole human behavior in connection with the field (ager) in the widest sense of the word and the last one defines the fundamental typologies of the agrarian usage of territory that derive from the favorability of soils and from the development level of production forces and of agricultural techniques. Some

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specialists assimilate the agrarian landscape with non-urbanized area landscapes. However we consider that the term is too large and fades away the real content of agrarian landscapes, with various and differentiated images connected to the surrounding and technical-economical factors action.

In fact, the agrarian landscape represents a rural landscape component, differentiated from its structure, firstly by its productive elements. These generate specific agrarian forms of space organization, dimensions, correlated with the territory agriculture potential with cultivated or grass parcels and technical-residential arrangements that are specific to agrarian exploitations.

The result of a long evolution in natural, social and technical-economical conditions, varying in time and space, the agrarian landscape has different forms agreeably to the degree of civilization in which it appeared and developed. This has determined the specialists to distinguish between the notion of Agrarian History and that of Agriculture History (Eugen Mewes, 1973). The base for the agrarian landscape is constituted by „the cultivated land” or the lay land – according to an ancient Romanian saying which has to occupy an important space of the rural territory in order to be framed in the notion of agrarian landscape. As Andre Meynier says (in his paper „Les paysages agraires”, Paris, Armand Colin, 1970) the agrarian landscape is permanently or temporally the one that modifies mostly the natural landscape, more than other economic activities (human settlements or communication ways).

The rural landscape, unlike the agrarian one integrates the attributes of the latter one, inclusively the habitat structures, the touristic arrangements, the historic objectives and the equipments that ensure the connection between the habitat and the productive forms, from which we can mention the marketplaces (the communication ways, the forest fond, the secondary manufacturing land resources that were implanted in rural zones, etc).

The agro-geographical region constitutes a concept that was stated by geographers for the grouping of the territorial forms of organization, improvement and equipment of the agrarian-productive space. In the taxonomy of rural landscape, synthesis of all usage and equipment ways of non-urban terrains, the agro-geographical region is not identifying itself with the rural landscape – a concept that is far more comprising, being a component of the latter as well individualized specific form of improvement, developing and specialization of rural economy.

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3 In the paper “Our Terra”, vol. III, Bucharest, 1973, eng. Eugen Mewes argues: “The agriculture history is the science that studies the evolution, in time and space, of the agriculture and forestry, of the agriculture institutions, relations and ideologies, as well as of the rural life from the political, socio-cultural, techno-scientific and economical point of view. The agricultural history is that part of the agrarian history that studies only the process of agricultural production” (p. 39). The complexity of the agro-productive phenomenon is viewed by the specialists in the history of sciences as “the history of the agrarian cultural landscape, of the farms and villages, of the agrarian population, of the rural economy and trade”. 
3. The Geography of the Rural Habitat
- the ensemble of the natural and socio-economic conditions, the qualitative and dynamic managerial activities that function as an integrated system
- chrono-spatial evolutions, morphological structures (gathered, scattered, dispersed settlements), rural communities administratively territorialized (2,850 communities, 45% rural population), 3% of the about 13,000 villages are concentrated in the field and low hills regions; the village, which is a bearer of spiritual and material values; the rural landscape translates the human settlements, the boundary of the commune and the rural population.

4. Rural Tourism (Agro-Tourism)
- areas with touristic vocation of landscape, entertaining, curative and cognitive value; comfort and leisure organization degree, professional recreation.
- variety of biodiversity (flora and fauna of rare species).
- protected zones and areas (9.3 million hectares in 2008, that is 39% of the surface of the country); 27 national and natural parks, 3 reservations of the biosphere (The Danube Delta, Retezat and Rodna).

5. The Geography of the Rural Industry
Units of the extractive and processing industry; the craftsmanship industry; small and middle industry; consequences on the territorial mobility of the rural population; the pressure of the industrial technique over the bio-productive eco-systems.

1. Land Use
- analyses the structure, the separation and the evolution of the categories of land use. The rural area holds 90% of the total number of types of land use. There prevails: agricultural land (14.7 mil. hectares, 61.7% of the total area of the country), forests (6.7 mil. hectares, 28% of the total area of the country), waters, swamps (8.5 thousand hectares, 3.5%), other types of use.

2. Agricultural Geography / Agrarian Geography
- determines the technical-agricultural conditions: productivity, trading of the yield.

The agrarian geography refers to territorial arrangements, agrarian structures and dynamic factors, anthropic interventions and physiogamy of the agrarian landscape, and so on.

The agrarian landscape: forms of organization, dimensions, agrarian potential (openfield, bocage, pays d’enclot, plantations).

Systems of crops and animal breeding: direct use of the vegetal mass through grazing; partially exploited cultivated field – fallow ground, evaluated agricultural systems, crop rotations, mechanisation, etc. agro-business – great efficiency specialized plantations.

Fig. 1. Sub-branches of the Rural Geography
(Source: Ion Velcea, 2002)
The agro-geographic region can comprise a part of the rural landscape elements that give extension into a certain agro-productive habitat specialization and of correlations between these, which can not be found with the same content and manifestation in other rural landscape. Thus, in the rural landscape of Dobrogea Plateau the northern part differentiates clearly from the southern part by its geo-ecological diversity, by means of the complexity of its agro-productive elements and by means of various habitat adaptation ways with the local medium conditions. It can be assimilated to the concept of agro-geographical region, distinct as a form of agricultural manifestation and specialization to Southern Dobrogea, an agro-geographical region with other content.

Leaning upon the concepts of agrarian geography and agricultural geography and taking into consideration the complexity of the current cultivated space organization according to the results of the scientific research in the agro-technical, genetic domain and that of the maximum efficiency usage of labor resources, a concept much more comprising has been contoured. This one comprises all depending factors of the agricultural geography and of the agrarian geography. In this complex vision Ion Velcea has formulated the concept of agrarian geo-economy, having the scientific capacity of synthesizing the integrality of geo-economical and demo-economical phenomena which give the synthesis of the rural space.

The rural geo-economy has in view the relations and the connections of the environment factors with the specialization and diversity of agricultural production and of the industrial-agrarian one, on territorial profile, taking into consideration also the social energy implementations – mechanization, chemistry, genetic engineering and that of working force qualification. It offers scientific concepts and scientific materials with practical implications in the intensifying capacity of agro-productive factors as well as in the location of biologic material that is in full accordance with the natural peculiarities of agricultural terrains to which it confers a superior quality. „Diversity in unity, this seems to be the essential feature of the rural world”.

c) The rural tourism / the agrotourism. The growing competition with the urban irreversibly reduces the limits of the rural, affecting the individuality of the latter. It has mobilized and renewed the attention of specialists in tourism in order to determine the tourist vocation regions and to improve the touristic infrastructure (the viable households for tourism, the accommodation and public food bases, the communication ways, etc). The geographers are directly implying themselves in the touristic activities by analyzing and mapping the landscape elements, the relief with touristic offer (glacial, karstic, and volcanic), and all the natural and anthropical components that are implied in the touristic resources. With this end in view there shall be drawn special maps comprising a series of characteristic indicators, as follows: the declivity, the relief accidents, the risk zones, as for example: the release of detritus, of avalanches, the localization and the characteristics of water sources as well as the details concerning the climatic elements evaluation with temperature differentiations to the limitary zones, the duration and destruction of the nival casement, long term rains or torrential rains, affected areas of marsh, etc.

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As a sub-branch of rural geography the specialists analyze the diversity of rural background, the modifications intervening in the structure of occupied population, mostly in touristic activities, the home and international touristic flow, the quality of the ambient background belonging to the touristic vocation areas limits.

The agrotourism is exercised on low scale because the comfort conditions required services are limited. „The inn – farms and the equestrian farms that ask for a continuous activity are the most solicitant ones” in France (Marc Chesnel)\textsuperscript{6}.

d) The geography of rural habitat. Between the sub-branches of rural geography the rural habitat geography has constituted, from old times, the major preoccupation of geographers for the analysis and determination of respectively components, of the structure and functionality, of the chrono-spatial evolution and of modernization ways. „As a permanent element, sedentary and of continuity, the Romanian Village has always had a complex characteristic physiognomy defined by the presence of a well intuit precinct where the homesteads and the outbuildings were concentrated, as well as by means of the place outside the house, the object of work and the space of developing the basic productive activities of the population”\textsuperscript{7}.

According to Paul Fenelon’s opinion (1970) the rural habitat represents the assembly of physical, economic and human conditions that numbers the population houses and the adherent buildings. The author distinguishes between the rural habitat and the agricultural habitat, the latter one being dominated by the necessities of agricultural activities, while the rural habitat comprises also a number of managerial activities (traders, school teachers, handicraftsmen in domestic industry, and others). As to the current conception, the rural habitat represents a basic socio-economical component. It assumes a complex geographic analysis, as follows:

- the morpho-structure (concentrated, dissociated, dispersed), the texture, the size, the urbanistic degree of renewal and the functionalities (residential, productive, of traffic, and others) of a rural permanent settlement;
- the characteristics and the territorial dissemination of some simple seasonal settlements (the sheepfold, the sheep pen) and of complex settlements (dwelling, room, hut, stable, manor);
- quantitative characteristics (human potential, densities, structures, territorial mobility) and qualitative-dynamic characteristics (working forces resources, qualification degree, professionalization degree) of the rural communities;

e) Rural industry geography. Nationally and globally there are a great number of extractive and manufacturing industry units, of small and middle manual industry units that function in rural settings. By means of the Rural Developing Program, the European Council supports the constitution of small and middle enterprises for revitalizing the rural settlements, for keeping the working force into a productive activity and in order to diminish the territorial mobility of the rural population.

The geographers and sociologists involve themselves in this sub-branch of geography in order to determine the structure and functionality of rural industry, in order to analyze the land industry structure and functionality, its working force, the territorial

\textsuperscript{7} Cucu Vasile, Bacanaru Ion (1972), The Geography of the Romanian Village, Rev. Sociologie Militans V, Edit. Stiintifica, Bucuresti.
mobility, the modifications that intervene in the structure and the dynamics of active population, in the rural landscape physiognomy due to the industrial activities.

It is true that the sector boundaries have not been surpassed yet and an integral conception, unanimously defined **over the individuality of the rural as a unitary territorial reality** of the geographic space has not been crystallized. Even in the titles expressly formulated like „Studies of rural geography” or from a sociological point of view „what becomes the rural” we must observe that the researches advantage either the village, as in the first case, or only „the social reality - as landscape and socio-habitational content”, in conclusion again the village, in the second case, which is studied from the perspective of its references to the city, or the agriculture, the folklore, etc. We can not find out anything apart from these realities which are competent and well scientifically contoured, even if some people declare themselves as advocates of field conservation without revealing its valences in the rural space.

2. **FUNDAMENTAL ELEMENTS OF THE RURAL SPACE**

The sectorial research, on components, beginning with sociology and geography have enriched our knowledge on rural phenomena but being marked by methodological limits they do not cover the entire rural space. R. Calmès and his collaborators observe, for example, that in France, the sociological papers besides other limits „do not offer but a weak place for non-agriculture” and „the rural economy favors the agricultural economy”, as regrettable a fact as the rural space completely covers a greater diversity of functions. The observation remains valuable in the case of geography papers that handle different data and heterogeneous methods leaving uncovered the integral parts of the territorial whole. In order to cover the whole rural space, the concept of „consummation” has been proposed according to which all the components (means) of the rural compete to „the process of collective working force reproduction”. It is a way to conceptualize the rural individuality with components centered on the process of reproduction of the rural demographic fond. In other words, it turns again back to a single dimension of the rural – the collective reproduction of the working force – certainly, essential around which all the others are polarizing, but it must not be forgotten that it is not the only centripetal force and it does not take place out of the space, even humanized. The collective reproduction process is common to all the villages and we can not see the ways in which the diversities and limits of the rural, of the rural typologies can be established in this concept while the space is ignored. The concept is though a step to the multi-criteria definition of the rural space towards the restrictive definition that introduces into the rural any commune with less than 2000 inhabitants.

The given example demonstrates the current necessity of seeing in the rural more than the village, something more diverse than the agricultural economy, the non-agricultural activities and the tertiary structures (productive or business structures) would like to tell us. In this sectioning and plotting the organizers of space, the specialists in arrangements and ameliorations shall not be able to find a scientific action point integrally conceptualized and the intimate resorts concerning the rural.
THE GENETIC FACTORS OF THE EVOLUTION AND SUSTAINABLE DEVELOPMENT OF TOURISM

Ion VELCEA, Ph.D. Professor

I. Natural Factors:
- geographical position, fundamental element within the specificity of the economic activities;
- natural scenes of landscape, entertaining, curative and cognitive value;
- favourable natural components;
- protected natural areas and biosphere reservations with international protection status.

II. Demographic Stock:
- human potential: labour, evolution of labour market and politics of occupancy on activity sectors, territorial mobility;
- skills and evolutions of the social groups (craftsmen trades);
- tourist rural settlements with watering and climatic, ethnographical and folklore, fishing, shepherd's functions.

III. Economic Basis:
- agricultural, forestry, piscicultural, hunting resources;
- industries from the rural environment, craftsman products.

IV. Structural Factors:
- youth emigration;
- depopulation of villages, private property restoration (1991, 1997, 2000);
- exaggerated parceling of agricultural lands, especially the arable ones;
- alterations within the structure of the crops.

V. Demographic Factors:
- town economic decline due to deindustrialization;
- professional reconsideration of the rural population from agricultural activities to tertiary ones.

VI. Vulnerability:
- human settlements affected by natural calamities: floods, landslides (overcharging of the slopes with households), devastating tempests, crumbling of salt mines;
- fragility of the mountain area regarding organisation and arrangement of the territory with touristic aims;
- anthropic interventions: deforestations, genetic alteration of the crops, excavation of the useful strata, constitution of the sources of public and private financing;
- generalization of the sewage network into a centralized system and of the drinking water in the rural environment;
- viability of the road substructure;
- programmes of rural development and the status of the suburbs within the limits of towns;
- preservation and protection of the natural lakes, of the biosphere reservations, of the natural and national parks, of the rare phyto-fauna elements.
The concept of rural geography that has been established on the principles and the methodology of fundamental geography, as a science of the entire planet (V. Mihailescu, 1968, The Theoretical Geography, Romanian Academy Publishing House, Bucharest) conceptualizes the rural space as part and product of this whole, in which synchronically coexist physical phenomena and social structures phenomena (the habitat and its population) and the economic structures (the primary and nonagricultural economy), relational structures, etc., that intimately connected one to the other and adapted perfectly or not to the nature of this geocological support by means of reciprocal relations. As against to its components the rural defines itself as a territorial whole, locally or regionally towards which each dimension either habitational or economic, or correlational do not singularize but is a part, as a product and factor of the whole rural territorial, giving to the geographic investigation profoundly correlated finalities, from which it can be easier draw out the openings of the geosystem, the main direction of movement of all its inner components, the flows on which the entire modality of coexistence between man and nature is established. Thus, the rural geography co-associates the frame (the nature) and the socio-productive manifestations following the law of parallelism,” upon which the frames and the manifestations can not reduce one another as they interact or structurally develop all at the same time” (Traian Herseni).

The rural, from the point of view of the conceptualized rural geography covers in conclusion a space with a diversity of physical phenomena, economical facts and structures with variable functions and relations, having greater dimensions as the component studies have sensed at first sight. In this acceptance, the property of the rural is the integrality that is the correlated sum of its real elements, not seen in their own proprieties but in their contribution to the whole rural propriety, by means of intimate relational channels and of connections of manifold components. The rural, as geographical reality is a territorial entirety, conditioned by components seen by the Rural Geography as variables (integrated by the territorial whole) that functions as an integrated system. Its fundamental habitat elements, its economical structures and services are regarded by the Rural Geography in reciprocal interaction relations that are developed on a natural conditioning fond and form an organized whole, more or less functional. Other scientific disciplines have to study each proprieties component in itself, proprieties which the rural geography is assimilating as a relation and interaction structured potential in determining the rural individuality. Also in this case, the idea expressed by Vintila Mihailescu, that of „divisions of geography are not divisions of the object but of the organized research on phases and elaborating ways, on branches and departments”.

The inhabiting and humanizing of the Romanian geographic space have followed the same way of inland identity and lead to the same results with local original peculiarities which were inherent to the geo-ecologic frame and to the fond vitality or to the demographic vitality, vigorously and steady in its communitarian efforts. All over the country the rural inhabiting of the Geto-Dacic and Daco-Roman land shows itself as synthesis of both ancient socio-historic, everlasting and of great complexity processes and phenomena. Their corollary has defined and is continuing to define a rural network processing constituted and perfectly adapted to the diversity of ecogeographic and historically-social local factors. Its originality derives naturally from the synchronic-
generalized necessity of living and of the ethno-cultural fond, dominantly native, Traco-Geto-Dacian, Dacian-Roman and Romanian crystallized on a territorial unit that is constituted by rich lowlands, appealing hills and protective mountains. These unitary components by geological evolution and morphogenesis, by hydrological convergences and pedo-hydro-geographic cumulates a natural potential that is improved by a real human vocation, synchronized in different applications and with fully social consequences.

Few people of the world could benefit of such unity between man and nature and in such a big proportion of the inhabited land favorability contribution in affirming the „Self Identity” that synthesizes and subordinates to this ideal the historical and the geographic arguments which have closely and fully co-operated in the developed our bimillenary past. The Carpathians crown has been the permanent support, the genetic source of most great natural individualities, of geographic manifestations and dynamiting support, of social life facts from the Danube to the Black Sea. It began to function with social vocation from the appearance of man and of rural archaic communities until the constitution, in the interior and marginal of the great present urban-rural agglomerations with such differentiated participations in the field of contemporary human world values.

According to this point of view the Rural Geography is a geography branch, a peculiar discipline that determines and defines the rural as the most comprising human affirmation area in the geographic space. Although its extension, through its transforming possibilities in values of unlimited natural resources usage as well as by means of the space offer for residential improvement, the rural cannot be individualized but by a synthetic analysis, method by which the Rural Geography operates all its components integration phases in the social-economic whole. The more rural combination variables is more complex the most compelling is the ascertainment that the human action has been more anchored in these formal stable living realities, the human potential has favored more usage values and the progress is manifesting more significantly.

The Rural Geography does not conceptualize the rural as a passive whole or as previously called in a certain concept „the consummation space”, that is of continuation, of consequences. On the contrary, it is a continuously space of interventions and actions between man and nature, between components and the whole having as a resultant, respectively integrated global consequence the achievement of fundamental structures of socio-spheres, undissociable to the territorial whole, especially as against the socio-economic whole that is specific to the rural space.

This does not mean that the Rural Geography considers the profile territorial whole as a space of interferences and connections in which the components disappear, lose their identity as it is well known that there are no functions outside some structures. For example, the village is not studied as a unit (object of human geography) but we can not forget that by means of its functions, the village is significantly marking the land views; it is enlisting with considerably supply in vivifying other structures. In fact everything that is connected to the land and its capitalization has come back to its managers, the peasants. Must we also underline the fact that the village is in itself the matrix of demographic positive change of the city and on other sides, it is a money provisioner for agro-alimentary products and of raw materials? Underlying its functions and contribution to the dynamics and consolidation of the whole rural, the Rural Geography does not diminish its stature quality in the territorial complex of the village. This optics remains consequent also in viewing the other components like the economic dimension, the production factor that result from the village
references to nature and other surrounding elements. Even the simple farms of rural homesteads, the usual housing for man and animal, with small production attributes are closely correlated on one side, with the physical factors and on the other hand, and mostly, with the extensive usage types of rural territory which is predominantly forest-pastoral.

3. THE RURAL TERRITORIAL COMPLEX

We have anticipated some definitions concerning the interferences between the Rural Geography and the non-geographic sciences that refer to the rural. The fact that Rural Geography is a synthesis science of the Complex Rural Territorial, seen as a whole, leaves to the historians the study in itself of the social group (of the social function), to the economists – interested in the analysis of economical structures, and so on. We must observe that almost none, if not almost all researchers do not begin from nature to man, as geography does, but from man and group (sociology), from economists (economy) etc. studies the real categories in themselves, ignoring the fact that the surrounding influence is a postulate, which is at the basis of each science that discloses the active adaptation of man and does not confirm a passive assertion of man to the external surrounding (G. Valsan, Works, page 5). The scientific contribution is rich and remarkable in the knowledge of rural phenomena. These adjacent profile sciences which Geography meets and collaborates on a common field, taking over and using its results, chosen with apprehension and discernment help Geography to organically integrate and correlate the rural complex components, based on essential data and on the social and economic sciences established by these disciplines. And, not remaining on a "strange terrain" the geographer follows the principle of „the proper laws of the studied element.... these relation with the territorial whole to which it belongs as factor and product, representing the geographic research specific” (V. Mihailescu, Works).

The place of Rural Geography, as a science of the whole rural complex, among the geographic sciences has not been approached methodologically until now. The syntheses on the rural space which this discipline tries to outline are especially useful and are searched with interest by the integrate establishment engineering. The condition is that Rural Geography should demonstrate a good and compelling orientation on this sensible and unstable terrain and to offer, on theoretical basis and on proper applicative options a solid starting point.

It has been indisputably demonstrated that the beginning of modern geography has begun with a series of geographical branches “that deserve to be consolidated as peculiar geographic sciences, besides the fundamental geography” (V. Mihailescu, Works). It is the normal development way of geography as a science, with specialization research branches that do not dissociate the object but recruit it. In order to remain in geography, as a science, these branches have as postulate „ the preliminary assimilation of the principles of theoretical geography that refer to the object and method and to the knowing of the integral complex in which the chosen element is incorporated as object of their special research” (Ibid).

In the light of these principles the Rural Geography constitutes, as object and method a peculiar geographical branch, specialized and established to scientific knowledge and not to its constituent, but to the entire rural geographic space. From the position of geography as science, it makes a scientific synthesis of a social existence model and of a
Rural space – functionalities and development strategies

way of space organizing that presents itself in landscapes as a territorial individuality in itself, stimulated by nature laws and regularities, in the order of substratum, by the economic laws and regularities, by the level of superstructure and of general functions in the process of the entire territorial entirety. The Rural Geography does not singularize its demarche neither in the support of determination factors, nor in man created cover as product and factor of the entire rural territorial, as sciences do when dividing in components and branches. It consecrates the study of an entire local rural, regional and planetary, consequently regarded not from a certain angle, but from all those which by means of functions and connections configure the whole in its integral manifestation.

We consider that it is clear enough that the Rural Geography does not overlap the domains, forms and processes studied in the rural territories by the other geographical branches. These follow a geographic analysis of a component, as for example the village or the economy, which the rural settlement geography and respectively, the geography of rural economy reads as part and not as a whole, although the geographic method asks for their adjustment to the entire territorial. This is not the same as the research of the whole, as complex rural system on which the Rural Geography integrally pronounces itself. Nevertheless it uses the data and the branches conclusions for motivating the image of the whole, of the rural landscape as a qualitative resultant of the co-operation of some hierarchic factors that are conditioned and interconditioned at the level of geographic synthesis. If it can not exceed the phases by means of components and branches, if it does not follow their integrating functions in the entire rural, then it locates as a geographic branch discipline and can not reach the specific sense of synthesis, phase at which it reaches only by „progressive spatial integration of the regional and local complexes” (V. Mihailescu, Works) part of which are also the rural complexes, with a corresponding taxonomy. It is neither simple nor easy to presents into an integrated synthesis the convergence points and the dynamics directions of inhabited spaces, of productive spaces, the other forming the base of their becoming. This is the research object of Rural Geography - integrated synthesis on the entire rural territorial – which differentiates it from the branch Rural Geography, having as subject „a certain part of the whole”, dissociated only on methodological necessities, as the whole can not be but unitary, to which the geographic research relates as product and factor, each analyzed phase.

4. GEOGRAPHIC PARTICULARITIES OF THE ROMANIAN VILLAGE

In Romania there are 13,000 villages, grouped in 2861 communes (2012) from which 62% are concentrated in the 4 historical extra-Carpathian provinces (Moldova, Dobrogra, Muntenia and Oltenia). They offer the prevalent note of the geographic landscape, concentrating 90% from the total surface of the country taking into consideration the extension of residential areas (village precincts) and of the productive ones (agricultural, forestry aquatic, special land). Numerically, the rural settlements register 45% from the total number of Romania’s inhabitants (2008), as a result of the population mobility and mostly as a result of definitive displacement intensification in urban industrial centers.

The rural permanent settlements are to be found in all relief unities of the country, but registering a greater concentration in the plain and low hills regions (over ¾ from the total number of villages). Altimetrically they develop from 3-5m in the Danube Delta (Vulturu, Cardon, a.s.o.) up to 1600m, in the Apuseni Mountains (Pietroasa, aprox. 160m).
Most of them, respectively 78% from the total localities (Geography of Romania, vol.II, 1984) are situated up to the altitude of 400m (from which ¼ between 200 and 400m), where the geo-ecologic offer is very favorable for agriculture and the geographic position and localization have stimulated the complex development of economic activities, of economic connections. Thus, only in the Romanian Depression there are concentrated 14% of the total number of villages and aprox. one third of the country’s rural population. Aprox. 20% from the total rural localities are placed at altitudes between 400 and 800m, corresponding to hills and high plains having rich land, mining and energetic resources and a greater agricultural complexity (vine-orchard and especially, zootechnic). At altitudes of over 800m, in the mountainous space accessible to permanent homestead, the rural localities represent aprox. 2% from the total settlements and are predominantly shaped for animal breeding based on natural pasture and hay.

The structure of rural settlements, that is the degree of denseness the homestead in the village precinct are differentiated according to the relief unities, to the degree of relief fragmentation and as to the nature of economic activities. According to these there have been determined three great types of settlements: villages with spread structure (dispersed or spread), characteristic for mountain regions where the agrarian space (predominantly the natural pasture and hay) are inserted in the village precinct; here the homestead alternate with temporary settlements (dwellings and rooms) spread all over the local territory; villages with spread structure (dissociated), specific to hill regions, determined by the existence of land resources, especially of vine-orchard cultures which give the dispersed and extensive character of homesteads; villages with collected/ added structure, that exist in the plain and low hills regions, that have a predominantly corny-zootechnic profile and with an important human potential. Apart from these there are the villages out of the limits of Sibiu Depression, partially Barsei Depression and those of Banatului Plain, where the homestead appear compact having numerous premises for animal breeding and forage bestowing. In the Getic Plateau etc. there appear linear type villages („road villages”) spread along the communication ways and the valley lane. To be observed that the structure of some rural settlements from the hill region has evolved towards the collected/added type as the economic function has amplified.

In the Danube Delta there are either villages with collected/added homesteads, as those from the loess field of Chilia (Chilia Veche/ Old Chilia), either villages with a spread structure and a mono-linear texture, determined by the orientation of fluvial grounds (Vulturu Gorgova, Crisan) or of the fluvial-maritime type (Sf.Gheorghe, C.A.Rosetti, Letea, etc).The number of inhabitants in the Danube Delta has been of 14000 in the year 2003, as to 20000 inhabitants registered in 1980.

The Romanian villages – having common features from the point of view of life mode, of production organization and of geographic landscape – present some regional differences as to the development historical-social conditions, as to the potencies of geographic medium, as to the capitalization degree of natural resources. Thus, the rural settlements of the central and western part of Romania, like some of the sub-Carpathian regions, who have entered earlier on the handicraft groove and that of complex land capitalization do not rise difficult problems in the systematization and modernization process. These settlements having great population agglomerations have a compact structure, a civic centre and a well built street grating; most of them have also industrial enterprises of national and local importance. For example, in Brasov County there are
numerous rural settlements that have enterprises, as: Bod (sugar enterprise), Prejmar, Lunca Calnicului, Halchiu, etc. (textile enterprises), Homorod (wood manufacturing), Cristian (furniture enterprise), etc.

In the extra-Carpathian regions where the plain and low hills relief is predominant the rural settlements have a collected/added structure and a geometrical texture. The agrarian and the agrarian-industrial function are predominant as against the potential of land, mining and energetic resources, as against the economic-social degree of rural settlements. The modification of economic base, by means of oil exploitation increase, of agriculture and communication ways modernization shall allow the reshaping of localities evolving to urban forms.

The rural settlements from the upper regions, with spread homesteads or spread along the mountain slopes, isolated from the access roads, insufficient edilitary fitted etc. have to be equipped from a technical-edilitary and social-economically point of view for developing a civilized life. The Romanian village shall continue, in the new socio-economic structures to represent a historic-social and social-economic category with a certain specific that derives from the characteristic occupational system, extensively non-crowded and creative-meditative. The village (without constituting an appendix of the city for placing the sweeping, the industrial scrap) shall be in a full coexistence with the city as to the value changes, this deriving from the industrial and agro-alimentary work specific which complete and influence each other. The towns shall continue to have a dynamiting role in economic and social life for the neighboring places.

In present conditions of great interest there is also the problem of protecting and maintaining the quality of rural environment, with all its originalities and richness of landscape. The process of organizing the geographic space that shall release into a new conception shall lead not only to contouring of some compact, collected structures with geometric textures but also to the preserving of landscape elements, of art monuments and of other nature, with touristic attributes, not affecting the traditional specific of the Romanian village, bearer of spiritual and material values.

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MAPPING OF INDUSTRIAL LANDSCAPE AND ANALYSIS OF URBAN BROWNFIELDS: TIMIȘOARA PERSPECTIVE

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Abstract. Started between 1970-1980 in the well-developed countries, the de-industrialization process covered Timisoara after 1990s. In most cases, industrial activities were suspended and spaces were abandoned or converted for other functions (residential, commercial etc.) There are some cases, where the industrial activities were refurbished, keeping the industrial function of the places. For the current research, all the industrial spaces from Timisoara were investigated using GIS techniques and from observation at the scene the main types of industrial landscape were established. From all, the brownfield type landscape, considered representative for the functional reconversion of the city, were analyzed. They represent an important land reserve, with obvious operational perspective and economical development.

Keywords: deindustrialization, conversion, urban regeneration, industrial district, GIS analysis.

INTRODUCTION

The 20th century represented a time of great changes for the entire world, a succession of events which lead to social, economic and technologic development. Human settlements considered important changes, which influenced both the geographic areas and the communities. The most important process was the industrialisation process which started at the end of the 18th century and determined important changes of the urban areas. At the end of the 20th century started the reversed phenomenon – the deindustrialisation.
1. CONCEPTUAL DEFINITION AND THE STAGE OF KNOWLEDGE

Deindustrialization represents both an economic and cultural transformation, being one of the most visible processes that have affected the majority of the urban centres. It is a process of shifting from an economic system based on industry to an economy of services and information. This process should be seen as an evolution and a progress of the society, as a new stage in the evolution of humanity. However, the effects of the deindustrialization are still visible and are often accompanied by certain negative consequences that redound upon both the human society and the environment (Bluestone, Harrison, 1982; Lever, 1991; Popescu, 2000; Vertova, 2006).

One of the main questions that appears in the deindustrialization process is what happened and what is happening to the areas that were once used by industry? To name these areas, in the last decades more terms have appeared, some of them being industrial landscape, brownfield or frishe. All these terms are used in the professional literature of different countries (brownfield – USA, frishe – France), and have some common elements, but also they employ some peculiarities that distinguish them from each other. If the industrial landscape has a larger significance and refers to the natural or urban territories that preserve essential components of the production process of one or more industrial activities (Law 6/2008, Chapter I, Article 3f.), the brownfield refers to the contaminated or potentially contaminated industrial fields that are abandoned at the present time (EPA, 2002), and the term frishe represents the areas that were used in the past, but are not used anymore, or are abandoned at the present time. Consequently, we will use the term of industrial landscape when referring to all areas which are still used or have been used for a long time for industrial activity and the term brownfield when referring to the areas which were used by industry in the past, but which are abandoned, unused and possibly contaminated in the present.

Using either the term industrial landscape or brownfield, the Romanian and foreign professionals have intensely debated the issue of the fields affected by the industrial activities in the last period of time, a series of works being produced: Ianoș, 1997; Parker, 1998; Popescu, 2000; Davis, 2002; Page, Berger, 2005; Chelcea, 2008; Lichi, 2011; Mirea, 2011; Wu, 2012 etc. Nevertheless, the term brownfield is not sufficiently tested and unanimously accepted yet. The main characteristics, that are generally accepted for a brownfield, are the following (Page, Berger, 2005):

- It has an industrial origin and represents the result of old industrial activity;
- It presents environmental problems, being contaminated or possibly contaminated as a result of previous industrial activities;
- It affects generally the urban environment, being predominantly localised inside or at the periphery of the cities;
- It represents the result of the adverse politics in the past and the unfriendly laws regarding the environment.

The perspective from which the brownfields are viewed is also very important. They can raise the worry of those concerned of the environment condition, or a certain melancholy from the people that were employed in the companies that functioned in the past
in those fields. Another perspective from which the brownfields are viewed can be an economic one, seeing the potential of the properties, and therefore it was opted for the reconversion and re-usage of those areas (Davis, 2002).

The reconversion of the industrial areas is a process that has appeared as a solution to reorganize the areas that once were occupied by industry and implied the destination change in the favor of commercial and residential projects. This process raised the interest of the professionals from more fields of study (Geography, Architecture, Urbanism, Sociology, History), beginning with the 70s when the developed capitalist countries (USA, Great Britain, France, Germany, etc.) shifted from the Fordism to the post-Fordism, that represented the basis for the deindustrialization and the abandonment of the industrial areas. The solutions that were found in these countries were generally successful, the reconversion taking place in the context in which the entire economy evolved toward the tertiary sector. After the fall of the communist regime, urban entrepreneurial islands emerged in Romania, too, which represent sources of urban revitalization and regeneration, and a solution to the problems created by the deindustrialization (Popescu, 2000, Chelcea 2008).

2. **AIM AND METHODOLOGY**

The objectives of this paper are the identification, localization and representation of the main types of industrial landscapes from Timişoara city employing digital models and the analysis of the actual condition of the industrial landscapes, of the main types of reconversion and of the industrial areas of brownfield type.

In order to achieve the objectives of this study, the first undertaking was represented by the study of the professional literature. After that, for the identification of the industrial landscapes of this city, a study of the cadastral and topographical plans, the historical maps and the satellite images from various years was considered.

The second stage of the study resided in the field-work analysis of some industrial landscapes and brownfields from Timişoara, and recording their actual condition. Based on the field observation in conjunction with the GIS techniques, I have realized digital models that represent the cartographic support of this article.

The final stage referred to the processing of the data collected from the field-work and from the existed bibliography, as well as the analysis of the satellite images. Based on the information collected during the first stages, I have created a database that contain 70 factories and companies, founded in different periods of time and localized in 8 industrial areas of Timişoara city. This database was created using ArGIS programme, and thus the digital models that consist in maps of the evolution and transformation of the industrial landscapes were completed. After the cartographic materials were realised, the interpretation of data and of the cartographic fund highlighted the transformation of the industrial landscapes in time, and especially, the changes produced within the industrial areas along with the deindustrialisation during the post-communist period. Then, I determined the main types of reconversion, taking into account the actual condition of the abandoned fields (of brownfield type).
3. TERRITORY OF STUDY

The territory studied in this research is represented by the area of Timișoara city that has known in time an intense and varied development of industry, being one of the first cities of Romania that has asserted itself in the industrialisation process (Popa, 2007; Ancuța, Muțulescu, 2012).

Traditionally, the industry of Timișoara city was localized mainly in two very well individualized areas: Fabric district and Iosefin area, where the largest factories in Timișoara were located. The localization of the industrial units were conditioned both by the vacant fields that the city administration had available and the transportation routes, being known that the level of accessibility is one of the most important factors in the analysis of the localization of an industrial unit. The great advantage of localising the factories in Iosefin areas was the Bega Canal (navigable since 1732), and also the railway between Szeged – Timișoara that was inaugurated in 1857. The industry has begun to disperse on the entire surface of Timisoara city in time and along with the development of new ways and means of transport.

The main stages of the industrialization process in Timisoara are:

- **The Habsburg (1716-1867) and austro-hungarian (1867-1918) administration**: it represents the start period of the industrial development in Timisoara. During this period were founded several factories: Beer Factory (1718), Cigarette Factory (1846), First Alcohol Factory and Refinery (1869), Shoe Factory „Turul”, Wool Factory ILSA etc.;

- **The interbellum (1918-1944)**: represents a stage characterized by political changes and the development of the city industry, new factories being developed: Battery Factory „Dura” (1920), Electrobanat (ELBA – 1921), Shoe Factory „Guban” (1937) etc.

- **The communist period (1944-1989)**: represents an industrial acceleration period that produced the migration of labor force from rural to urban settlements. The number of inhabitants is growing rapidly and also a lot of spatial changes are present. Also, new industrial platforms are opened (Industrial Platform Freidorf, Buziaș etc.) and new industrial units (AEM, UMT, Spumotim, Electrotimiș, Electromotor etc.).

- **The post-communism period (after 1989)**: this period is characterized by a deep restructuring process of the country’s economy, dominated by the transition from centralized (planned) economy to market economy. The majority of factories are privatized, relocated (from city center to peripheral areas) or abandoned. For some abandoned industrial landscapes (brownfields), a reconversion process has started.)
4. DISCUSSIONS AND RESULTS

After the processing and the analysis of the data obtained on the field-work, I have remarked that half of the industrial units either have changed their destination, and become commercial, residential or services areas, or become abandoned areas, while the other half maintained its industrial function (Figure 2a). Nevertheless it must be specified that the surface of the areas where industrial activities are still present is still larger than the surface or the abandoned areas or of those that are in the process of functional reconversion (Figure 2b). Thereby, if the reconversion process has transformed 22% of the total industrial units, the total surface of these units represent only 8% of the total industrial landscape. It is still alarming that the dimension of the brownfields is very large (35% of the total industrial landscape). Concerning these areas, no measures were undertaken, and the negative effects over the environment and the society are still felt.
In an analysis on the timescale we have remarked that the most companies were founded in the communist period, when the industrialization process was forced and imposed from the central government. Thereby, from the total of 70 industrial units that were included in the hereby study, 30 were founded in the communist period, 18 in the pre-war period, 15 in the inter-war period, and 9 in the post-communist period (Figure 3). At present, the majority of the industrial units that were founded in the past suffered transformations, with the exception of those that sprung in the post-communist period, still continue to maintain their industrial function. Some of these multinational companies that have emerged lately were placed on the location of old companies from the industrial platform that were inaugurated in the communist period (Ex. Continental company on the UMT platform, Pădurea Verde industrial area).

In each industrial area, except the central area, there is at least one functional industrial unit (Figure 4). The disappearance of the industry from the central area of Timișoara city is due to both the deindustrialization and reconversion processes and the relocation processes. Thereby, some industrial units have been moved from the central part of the city to the periphery (ex. Modatim was relocated from 700 Market area to Calea Șagului area) where there is more space for the horizontal development, while the territory from the central area can be capitalized in other ways.
Consequently, the most processes of reconversion are found in the central areas, where the industrial areas have been transformed in commercial, service and residential areas, respecting in this way the general trend that characterizes the modern cities.

Brownfields still cover large areas of the within incorporated areas of the city, having a share of 28% from the total industrial units that number a total of 2.1 square km. The knowledge of this type of landscape may have a special importance in the future urban development of Timisoara city. The reconversion of the industrial-urban landscape or the rehabilitation of the abandoned industrial units can provide major economic, social and environment benefits. There are several types of brownfields transformation, according to the architectural and landscape changes that are produced:

- Total transformation, that implies the demolition of the industrial units;
- Partial transformation, that implies the keeping of some buildings of major importance;
- The rehabilitation of the industrial buildings, with or without the change of the functional profile.

From the total of 70 industrial units, 25 of them have suffered significant transformations according to the above categories. In many cases, in the context of permissive laws and of almost nonexistent input of the local community towards such transformations, it was called for the total transformation and the demolition of the industrial units. In their places, the most frequent solution chosen was the functional
reconversion (Figure 5). Therefore, in 36% of the cases in which industrial landscape was transformed, it was opted for the demolishing of the old industrial units, and in most cases a reconversion toward services, commercial and residential areas was brought about.

<table>
<thead>
<tr>
<th>Building rehabilitation and Industrial function</th>
<th>Building rehabilitation and functional conversion</th>
<th>Total transformation</th>
</tr>
</thead>
<tbody>
<tr>
<td>32%</td>
<td>20%</td>
<td>36%</td>
</tr>
<tr>
<td>Partial transformation</td>
<td></td>
<td>12%</td>
</tr>
</tbody>
</table>

Fig. 5. Transformations in industrial landscapes in Timisoara

One eloquent example of total transformation of a brownfield is represented by the reconversion of the former “Fructus” factory from the central area of the city that was abandoned after the year 2000. Afterwards, the property was purchased, the buildings were demolished, then the place was cleaned and transformed in mixed functionality areas – residential and services (see figure 6). The same thing happened in two other cases of industrial units from the central area of the city: the Bread Factory and the Milk Processing Plant, which have been replaced by new commercial buildings.

At present, a similar process occurs in the context of the Industria Lânii (Wool Industry) company (ILSA) where the old building was demolished, and on the emptied field started the construction work for a residential compound named “The New Timişoara.” Although the project should have been finished until now, only a part was accomplished, and the rest of the field is in danger to remain at the brownfield level.

From the category of the partial transformation, I have identified two industrial units that are in the reconversion process, where only some buildings with architectural value were preserved: Stockings factory and communal Slaughter-house. In the first case, the reconversion is made towards the commercial sector, maintaining the old building body that was declared a historical monument. A similar case is also the communal Slaughter-house where it is intended the construction of a commercial centre. The architects proposed the integration of the heritage buildings into the new commercial areas.

From the last category, the one in which the former brownfields were completely rehabilitated, the most eloquent examples are those in which large multinational companies have been placed on the industrial platforms of the city in the post-communist period. These companies modernized the old industrial halls and buildings of the former companies continuing hereby the industrial activities in the old facilities. One example in this case is the Comtim company from Freidorf area. After a period in which the old industrial units were in decline and abandoned, the new owner rehabilitated the old industrial compound making it functional again. Another example of complete rehabilitation belongs to the Optics Factory from Buziaş industrial area. In this case, it was a functional reconversion in which the old industrial unit was rehabilitated and transformed in office area.
Fig. 6. Transformation types in industrial landscapes of Timisoara
a. total transformation – Fructus, past and present; b. partial transformation – Sock Factory conversion into commercial spaces; c. building rehabilitation – Optica Factory converted into services; d. brownfield, no actions – Solventul
(Sources: www.flickr.com (Szekely, 2005); maps.google.com; wikimapia.com; opiniatimisoarei.ro)

Although the reconversion processes have started to be more intense lately, the number of brownfields that are not under any undertaking is still very large (20 brownfields) being spread in the whole city. Most of these areas are still localized in the old industrial areas that are situated close to the city centre (the central industrial area, Iosefin industrial area, Fabric industrial area). The tendency of moving the industry toward the periphery of the cities in the last decades has left behind even in Timișoara many of these abandoned areas that are in a continual process of degradation.

CONCLUSION

After the study was carried on, it was highlighted the actual situation of the industrial landscapes from Timișoara, as well as the importance of the reconversion undertakings over the areas of brownfields type. These areas that come after the deindustrialization processes still cover a very large surface from the total of the industrial landscape (35%), and number 20 brownfields. The only processes that can change the fate of these areas are the functional reconversion and the reintegration in the industrial sector. Concerning the areas located in the central area, the best process would be the functional reconversion.

The reconversion processes have transformed only a reduced number of industrial units up until now, occupying only a very small area (8% of the total industrial landscape). The intensification of this process and the decommission of these areas would bring benefits both to the environment, that would not be affected any longer by the pollution from the contaminated areas, and to the social and economic environment, because these fields could be used by the community (new workplaces, residential areas, green area, etc.).

Acknowledgment

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ETHNO-DEMOGRAPHIC PROCESSES OF THE ROMANIAN MINORITY IN SERBIA DURING THE PERIOD 1948-2011

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Abstract: From ancient times Romanians have been an integral part of a multi-ethnic population in Serbia. Today the Romanian population lives in about 138 settlements in the Republic of Serbia: Bor, Braničevo, Zaječar, Pomoravlje, Podunavlje, Nišavsk a and Rasina districts. The largest number of Romanians are living in the autonomous province of Vojvodina, making 1.5% of the total population. Paradigms of ethno-demographic processes, observed in the period from 1948 to 2011 year, indicate very complex changes in the Romanian minority in Serbia, characterized by: a total population reduction, population aging, immigration, assimilation. This paper represents the ethnic theory that ethnic minorities develop in interaction with other ethnic groups.

Keywords: Romanians, Serbia, depopulation, projections of the Romanian population in Serbia

1. INTRODUCTION

The Republic of Serbia is a country with a heterogeneous ethnic composition, and a great number of different ethnic communities1 live on its territory. Such ethno-demographic

1 The Government of the Republic of Serbia - Office of Human and Minority Rights has registered 20 national councils of national minorities including the National Council of the Romanian national minority.
phenomenon is the result of a number of factors: geographical location, a large number of neighboring countries, chaotic and planned migration, wars, epidemics, industrialization and urbanization. Frequent changes of state borders have influenced the changes in the demographic structure of the population in Serbia and its geographic distribution. Since ancient times, Romanians have been an integral part of the multi-ethnic structure of the population of the Republic of Serbia. Uncontrolled migration of the Romanian population from Turkish invasions, but also for economic reasons to the territories of Serbia, as well as a planned settlement of Romanians in the western part of Banat (Vojvodina), by the Viennese court, have most influenced the present-day distribution of Romanians in Serbia, then metanastasic movements (Cvijić, 1991) and colonization of Romanians in Vojvodina in the 18th and 19th centuries (Jankulov, 2003, 45-50). Today Romanians live in 138 settlements in the Republic of Serbia, in the counties: Bor, Braničevo, Zaječar, Pomoravlje, Podunavlje, Nišava and Rasina districts. The largest number live in the autonomous province of Vojvodina, making 1.5% of the total population of Vojvodina. Paradigms of ethno-demographic processes of the Romanian minority community, observed in the period from 1948 to 2011, indicate very complex changes of the Romanian minority in Serbia through: total reduction of the population, aging of population, assimilation, integration and the creation of specific form of identity.

2. METHODOLOGY

The research process is based on the interest in the study of the Romanian population in Serbia, and the idea that the Romanian population in Serbia is in specific dynamic ethno-demographic processes, as well as on the theory that Romanians are in the process of quiet assimilation and integration with the Serbian majority. Regarding the methodological procedure, we opted for the "case study" method, deeming that by applying this method we can adequately perceive the generation, description and the real life context in which the Romanian population is nowadays, in order to preserve the integrity of the Romanian population, their spatial and temporal location.

The reference material for the study of national minorities in the Republic of Serbia is based on the methodology of the National Bureau of Statistics of the Republic of Serbia, which is used when conducting a census to determine the ethnic background, which is based on a subjective statement or self-definition of the respondents. Each person included in the census of population in the Republic of Serbia has the ability and the right of free expression or failure to declare affiliation on his national origin. Subjective principle of self-determination opens the possibility of changing attitude of their own ethnicity and that attitude varies from census to census, which is evident in the censuses of the Republic of Serbia, especially in censuses after 1948.

In previous researches of the Romanian national minority, it is evident that a small number of experts dealt with the problem of ethno-demographic processes, natural migrations and compositions of population, families, households, so that it is difficult, in this context, to dispute with other studies and the results achieved. However, the researches of Maran Mircea (Maran, 2011) and (Djuric, Maran, Simikić, 2011) stand out. We have

used the above mentioned historical and sociological studies, written in the Serbian language, which refer to the Romanian population in Serbia, for the purpose of explanation of the phenomenon of the Romanian population as an integral part of the multi-ethnic structure of the population in the Republic of Serbia.

In the research process were collected ethno-statistical data for the time period from 1948 to 2011. In order to achieve a new, more complete, more specific, more accurate and deeper knowledge and predictions of the future development of the Romanian population, projections were made of the migration of the Romanian population, for the projection period from 2016 to 2041 year, by using mathematical methods: interpolation and geometric progressions.

3. RESULTS

Censuses of population, households and dwellings conducted after the Second World War in the Republic of Serbia, indicate significant depopulation and dynamic structural changes in the Romanian population.

Table 1. The Romanian population in Serbia, as per the 1948 – 2011 censuses

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<tbody>
<tr>
<td>Romanians</td>
<td>63.130</td>
<td>59.705</td>
<td>59.505</td>
<td>57.419</td>
<td>53.693</td>
<td>42.316</td>
<td>34.576</td>
<td>29.33</td>
</tr>
<tr>
<td>Index</td>
<td>100</td>
<td>94.6</td>
<td>94.2</td>
<td>90.9</td>
<td>85.1</td>
<td>67.1</td>
<td>54.7</td>
<td>46.5</td>
</tr>
</tbody>
</table>

For the studied time period from 1948 to 2011 (Table 1) in the Republic of Serbia, a decline of the total Romanian population for 53.5% was recorded. The census from 1953 indicated the reduction of the population for 3,425 inhabitants, compared to 1948. According to the census of 1961 a further drop of 200 residents was recorded, compared to 1953. The census from 1971, confirmed the previous trend of depopulation, so that the number of Romanians fell by 2,086 while according to the census from 1981, the number of Romanians fell by another 3,726 people. The inter-census period from 1981 to 1991 was characterized by the greatest decrease in the Romanian population when their number was reduced for 11,377 inhabitants. The last two censuses also recorded declining of population in the Romanian national community. According to the census from 2002, the number of Romanians fell by 7,740 residents, and according to the census from 2011, their number decreased for 5,244, compared to 2002 year, and came to an absolute minimum for the entire observed period.

http://webrzs.stat.gov.rs/WebSite/Public/PublicationView.aspx?pKey=41&pubType=1

Data of the Bureau of Statistics of the Republic of Serbia
Fig. 1. *Course of the Romanian population in Serbia, as per the 1948–2011 censuses*

Table 2. The Romanian population in Serbia, according to the 1948–2011 censuses (in percentages)

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</thead>
<tbody>
<tr>
<td>%</td>
<td>0.97</td>
<td>0.86</td>
<td>0.78</td>
<td>0.68</td>
<td>0.58</td>
<td>0.54</td>
<td>0.46</td>
<td>0.41</td>
</tr>
</tbody>
</table>

As the Romanian population in Serbia over the last 63 years is characterized by constant depopulation, therefore the participation of the Romanian ethnic community in the total population of the Republic of Serbia (Table 2) with 0.97% according to the census of 1948 decreased to 0.41% according to the last census in 2011 year.

Table 3. The Romanian population in Serbia by geographic regions and censuses in 2002, and 2011

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<tbody>
<tr>
<td></td>
<td>Number</td>
<td>%</td>
</tr>
<tr>
<td>Belgrade</td>
<td>1,379</td>
<td>4</td>
</tr>
<tr>
<td>Vojvodina</td>
<td>30,419</td>
<td>88</td>
</tr>
<tr>
<td>Šumadija and West Serbia</td>
<td>780</td>
<td>2.2</td>
</tr>
<tr>
<td>South and East Serbia</td>
<td>1,998</td>
<td>5.8</td>
</tr>
<tr>
<td>TOTAL</td>
<td>34,576</td>
<td>100</td>
</tr>
</tbody>
</table>
Fig. 2. Regional distribution Romanian population in Serbia

Historical circumstances caused that Romanians, in the area of present-day Republic of Serbia, are mostly populated in the region of Vojvodina and in its eastern and southeastern part (Jankulov, 2003, 87). According to the census from 2002 year (Fig. 3) Vojvodina was populated by 30,419 or 88% of the total Romanian population. The census from 2011 year (Fig. 4) also confirms the highest population of Romanians in Vojvodina. In
this census period, a reduction of the total Romanian population for 16.5% was registered. The region of Southern and Eastern Serbia is the second regarding the number of Romanians. Their number according to the census from 2002 amounted to 1,998 or 5.8%, while according to the census of 2011 it increased to 2,073, or 7.1%. In the region of Belgrade 1,379 Romanians lived in 2002, or 4%, while in 2011 that number decreased slightly and amounted to 1,282 whereas the percentage of participation in this region, due to the decrease in the total population, increased by 0.4%. The smallest numbers of Romanians on the territory of the Republic of Serbia live in the region of Šumadija and in western Serbia. According to the census of 2002, 780 residents of Romanian nationality were registered, or 2.2%, while according to the census of 2011, their number decreased by 27.3%.

From the perspective of the dominant type of settlement that the Romanian minority inhabit, it can be observed that most Romanians 20,905 or 71.3% live in rural areas while only 8,427 or 28.7% of Romanians live in urban areas. These data indicate that in terms of the social structure, the Romanian minority is composed of the population with a dominant agricultural function.

Along with the reduction of total Romanian population, the number of the inhabitants who declared that the Romanian language was their mother tongue also decreased (Table 4). Based on the results of the census from 1953, it was evident that 66,594 people spoke the Romanian language as their mother tongue, even 6,889 residents
more than the total number of Romanians, registered that year. According to the last census from 2011 the data purport that 29,075 people or 99.1% of the population speak Romanian language as their mother tongue, or 257 inhabitants fewer than the total number of Romanians in Serbia.

Regarding the gender structure, the female population dominates the Romanian population in the Republic of Serbia. According to the census from 1991, the female population accounted for a share of 51.2% of the total Romanian population; according to the census of 2002, the female population had a share of 51.1%, while according to the last census in 2011, proportion of the female population increased to 54%.

Analyzing the age pyramid (Fig. 4.) depicted according to the census results from 2011 we can conclude that there is a disorder of the age structure. The Romanian population took on the characteristics of the regressive (old) population. Looking at the Romanian population by brief classification and major age groups, we see the dominant share of the aged population (the population aged 60 years) and older middle-aged from 40 to 59 years compared to the young and young middle-aged population.

Examining the ethnic composition of the Romanian minority by religious affiliation, we have learned that among Romanians in Serbia (Serbia is a secular state) there is religious pluralism. Except the affiliation to the Romanian Orthodox Church, they belong also to other religious confessions: Greek-Catholic, Christian-Nazarene, uniat church. From the late 19th and early 20th century, various religious communities appear among Romanians: Nazarene, Adventists, Baptists, Pentecostals (Djurić, 2010, 5 -153).
Within the study of the Romanian population in the Republic of Serbia, a question arises concerning Vlachs. Vlach and Romanian in eastern Serbia are two names for the same people, and so that should be acknowledged in to all documents and public procedures.

Table 5. The Vlachs population in Serbia, as per the 1948 – 2011 censuses

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</tr>
</thead>
<tbody>
<tr>
<td>Vlachs</td>
<td>93,440</td>
<td>28,047</td>
<td>1,368</td>
<td>14,724</td>
<td>25,596</td>
<td>17,804</td>
<td>40,054</td>
<td>35,330</td>
</tr>
<tr>
<td>%</td>
<td>1.43</td>
<td>0.40</td>
<td>0.02</td>
<td>0.17</td>
<td>0.27</td>
<td>0.23</td>
<td>0.53</td>
<td>0.49</td>
</tr>
</tbody>
</table>

Chronologically speaking, according to censuses from 1948 to 2011, the Vlach population in the Republic of Serbia decreased three times (Table 5). According to census from 1948 Vlachs had a largest population - 93,440 or 1.43% of the total population while the least was according to census from 1961 – 1368 or 0.02% of the population of Serbia. According to the last census in 2011 the Vlach population numbered 35,330 or 0.49% of the total population of Serbia. Vlachs are territorially concentrated in the region of southern and eastern Serbia where they make up 93% of their total number in the territory of the Republic of Serbia. Within this region, the Vlachs are numerically the most significant ethnic communities after Serbs and Romanians, with a share of the total population of the region of 2.1%. Vlachs have no ethnic prevail in any municipality. They mostly live in a Bor region (13.3 thousand or 10.7%) and Branicevo region (13.2 thousand or 7.2%), which is 80.6% of the total number of Vlachs from southeast Serbia. Also, the relevant number and share they have in the Zajecar district (6.3 thousand or 5.2%). That actually means that in these three districts over 99% of the Vlach minority is concentrated. Observed by municipalities, most of them live in Bor (6,701 or 13.8%), then Petrovac na Mlavi (4,609 or 14.7%), Kucevo (3,927 or 25.3%), Negotin (3,382 or 9,1%), Boljevac (3,356 or 25.8%), Zagubica (2,811 or 22.1%) and Majdanpek (2,442 or 13.1%). In percentage terms, the most Vlachs, about one-quarter, live in Boljevac, then Kucevo and Zagubica. Statistical and demographic parameters indicate that the Vlachs are among the oldest populations in Serbia with an average age of over 50 years.

The process of depopulation of the Romanian population in the Republic of Serbia is evident from the second half of the 20 century. Bearing in mind the long-term trends in the past and all the factors that conditioned changes in the Romanian population, and starting from the assumption that the future will resemble the past, we have anticipated by projections, the future development of the Romanian population by five-year projection interval in the projection horizon from 2016 to 2041 (Table 6). The projections made confirm the continuation of a disturbing trend of depopulation (Fig. 5). The largest decline is predicted by projection - by interpolation method, based on the census of 2002 and 1991 because the most drastic decline of the Romanian population in Serbia was precisely in that period.

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6 Dragić Dragomir, Vlachs or Romanians from eastern Serbia and Vlachs question. The Helsinki Committee for Human Rights in Serbia, Belgrade, 2002
7 Data of the Bureau of Statistics of the Republic of Serbia
8 Raduški Nada, Ethnic processes and national minorities in Serbia after the 2011 census, New Serbian Political Thought, December 8, 2013
The aforementioned projection indicates that the Romanian population will number 20,732 inhabitants in 2021, 12,132 inhabitants in 2031, and only 3,532 inhabitants in 2041. Trend of the total reduction of the Romanian population was slightly less in the inter-census period of 2002-2011 which was reflected in the projection horizon. The projection made by interpolation method based on these two censuses shows mild downward trend, so that the number of Romanians in Serbia, according to this projection model will be of 23,506 inhabitants in 2021, 17,680 inhabitants in 2031, and 11,854 inhabitants in 2041. By Interpolation method we obtained the assessment of the Romanian population in inter-census years: 2016, 2026 and 2036. The lowest depopulation is anticipated by population projection made by using the method of geometric progression, according to which the number of Romanians in Serbia, will amount to 24,433 inhabitants in 2021, 20,352 inhabitants in 2031, and 16,952 inhabitants in 2041.

Table 6. Projections of movement of the Romanian population in Serbia from 2016 to 2041 year

<table>
<thead>
<tr>
<th></th>
<th>S T A T U S</th>
<th>P R O J E C T I O N S</th>
</tr>
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<tbody>
<tr>
<td>2002</td>
<td>34,576</td>
<td>20,732</td>
</tr>
<tr>
<td>2011</td>
<td>29,332</td>
<td>17,680</td>
</tr>
<tr>
<td>2016</td>
<td>26,419</td>
<td>12,132</td>
</tr>
<tr>
<td>2021</td>
<td>23,506</td>
<td>3,532</td>
</tr>
<tr>
<td>2026</td>
<td>20,593</td>
<td></td>
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<tr>
<td>2031</td>
<td>17,680</td>
<td></td>
</tr>
<tr>
<td>2036</td>
<td>14,767</td>
<td></td>
</tr>
<tr>
<td>2041</td>
<td>11,854</td>
<td></td>
</tr>
</tbody>
</table>

Fig. 5. Projections of movement of the Romanian population in Serbia from 2016 to 2041
4. ANALYSIS

The absence of major natural geographical barriers and the proximity of the mother country influenced that Serbia has the largest concentration of Romanians in the southern and southeastern Banat. The first Romanian settlements on the territory of the Serbian part of Banat are mentioned very early (14th century). However, the largest immigration of Romanians on the territory of presentday Vojvodina was from the 17th to the 19th century (Bjeljac, 2006, 375). During the reign of Prince Miloš Obrenović, in the Principality of Serbia, there were the most Romanians, after Serbs. Considering that they were of the same faith as Serbs, they were always considered as equal to them by the government, and they were not numerically singled out from Serbs anywhere (Djordjević, 1938).

In the first modern census of population, households and dwellings in the Kingdom of Serbs, Croats and Slovenes, which was conducted 1921 year, on a territory that included present-day Vojvodina, the Romanian population with 71,364 inhabitants, made 4.6 % of the total population in Vojvodina. The population that spoke the Romanian language was the largest according to census from 1921 year, and they lived on the territory of Banat (95.1 % of all Romanians in Vojvodina), where they had absolute majority in one administrative district (Alibunar) and they lived in substantial number of districts Novi Bečej, Kovačica, Kovin and Pančevo. On the territory of Bačka they were more prevalent in the county Apatin (Bjeljac, 2006, 375-382).

Frequent changes in census methodology of ethno-statistical parameters and changes in statistical classification, which implied the introduction of new or omission of the earlier question, led to certain instability in comparison of ethno-statistical data for the Romanian national minority, during the censuses conducted from 1921 to 2011. Thus, according to the census from 1921 year, Romanians were classified as a group of people based on the determinant “language”. According to the censuses of population from 1948, 1953, 1961, 1971, 1981 and 1991, the question of nationality was posed in terms of equality and free expression. According to the census from 1948, Romanians were considered to be a nationality. According to the census from 1971, they were a nationality or ethnicity, and according to the census from 1981 they expressed their belonging to a nation, nationality or ethnic group.

According to the census of population, housing and dwellings of 1948, Romanians had the largest spatial distribution on the territory of Serbia, in the former FNR of Yugoslavia, where 98.45% of all Romanians lived. The highest concentration was in Vojvodina (92.46%) and on the north-eastern part of central Serbia (5.99%).

The census of population, housing and dwellings, from 1953, indicated a decline in the number of Romanian population, but it also showed that 98.92% of all Romanians lived in Serbia (94.81% in Vojvodina, 4.11% in Central Serbia). Census of population, housing and dwellings from 1971, indicated a further decline in the number of Romanian population in the territories of the former SFR of Yugoslavia. Romanians in Serbia made 98.03% (90.47% in Vojvodina, 7.53% in central Serbia).

According to the census from 1991, the Romanian population had an absolute majority in 18 settlements, while they had a relative majority in three settlements, of the total of 176 settlements in Vojvodina which they inhabited. In nine settlements (Ečka, Zrenjanin municipality; Banatsko Novo Selo, municipality of Pančevo; Alibunar, Alibunar municipality; Sutjeska, municipality of Sečanj; Vlajkovac, municipality of Vršac; Deliblato,
The share of the Romanian population was greater than 10% of the total population in those settlements (Bjeljac, 2006, 375-382). The censuses of population, households and dwellings conducted in Serbia in 2002 and 2011, indicated a further decline in the total number of inhabitants of the Romanian population.

According to the census from 1991, Romanians inhabited 149 municipalities in Serbia, including data for Kosovo and Metohija (0.03 %). The census from 2011, indicated, observed by municipalities, that the Romanian population inhabited 138 municipalities in Serbia (excluding Kosovo and Metohija). The territorial distribution of the Romanian population has not changed and it is under the direct influence of territorial distribution of Romanians formed through a very long historical period of existence in the territory of the Republic of Serbia. We can say for the Romanian population, that it has the character of dispersive ethnic group, because they have settled in several regional areas of the Republic of Serbia.

All analyzed data indicate that the ethno-demographic changes in the Romanian population are very complex and conditioned by numerous factors. Total strength of the Romanian population is constantly changing. These changes are influenced by the natural movements, i.e. by fertility and mortality, and they are also affected by migration flows. Unfortunately, we do not possess information on whether Romanians emigrated to Romania, after the accession of Romania in the community of the European Union, in 2007. Since the old-age of the Romanian population is evident, a constant decline in the fertility of the population is also obvious. When we talk about gender composition, the Romanian population has no stable character considering that, as seen by the census intervals, the participation of a female population in relation to the male is increasing.

The age structure is changing in the long-term and it is mainly influenced by movements in fertility. Based on previous studies of the Romanian population, absolute participation of some age groups in the total population, the age pyramid of a regressive type was obtained. The age structures demonstrate that compared to the older generation, the participation of children and young people is declining. Such a relationship causes low fertility rates and birth rates, and increases the mortality rate, which directly affects the negative natural increase.

All applied projection methods base similar dynamics of changes, more exactly, the depopulation of the Romanian ethnic minority for the projection horizon from 2016 to 2041 year. The most optimistic made projection, performed by the method of geometric progression, indicates that the Romanian population in 30 years, namely by 2041 year, will decrease for 57% compared to the census from 2011 year.

Mircea Maran, a connoisseur of the Romanian population in Vojvodina, argues in his researches (Maran, 2013, 229-238) that "in addition to national and ethnic - Romanian identity, there are also many other forms of identity, such as the identity of belonging to the country in which live - once Yugoslavian, now Serbian and regional-Banat inhabitants, which is in some cases quite pronounced for most members of this minority, then local, which is linked to the place of birth or residence, and finally confession-religious, primarily Orthodox, which is usually supplemented with national identity. All these types of identity are intertwined with each other, complement each other, but sometimes cause certain confusion in the Romanian population.” This is certainly indicated by the fact that a
5. DISCUSSION

Ethno-demographic researches of the Romanian minority conducted in the Republic of Serbia, in the period of time from 1948 to 2011, represent a synthesis of older researches and new researches and new discoveries of its kind after the census in 2011. This type of research is an important part of the study of the Romanian population in the overall population of Serbia. The obtained results fit into a broader ethno-demographic study of the population of Serbia. In any case, our researches allow assessment of the current situation and likely movement of the Romanian minority in the future, in the territory of the Republic of Serbia.

The question is: Whether the process of assimilation or integration of the Romanian ethnic minority in Serbia is underway or completed. Maran believes that "In spite of everything, Romanians still consider themselves an integral part of the Serbian society, so that their dual identity, and in these recent times is expressed as the identity of citizens who are integrated into the state in which they live, and who do not give up of their national - Romanian identity. The psychic assimilation is added to it, which refers to taking over the ways of thinking, mentality, customs, habits and traditions of the majority of people, and it usually takes place unconsciously. There is, however, the so called socio-ethnic assimilation, which is characteristic of the multi-ethnic environment and is manifested through mixed marriages, education in non-mother language etc." (Maran, 2013, 229-238)

We agree with the opinion and research of the Roumanian historian, Maran Mircea, that the phenomenon of assimilation of the Romanian community in Banat is "primarily related to the use of the mother tongue (and not a literary language, but a dialect), which is not a language of 'majority' or the country in which minority one lives, and consists of a sense that a member of minority people, in spite of equality with the majority of people, despite the ability to use their mother (literary) language in the schools, the press, public life, still feels a dose of inferiority, which is based on the idea of belonging to the Serbian people (Maran, 2013, 229-238).

We must emphasize that the implementation of international recommendations to issues of ethno-cultural characteristics of the population does not belong to the so-called basic features (core topics), to which the Republic of Serbia adheres, significantly impede comprehensive researches of the Romanian population, as an official ethno-statistical data on confession of faith, mother tongue, and ethnicity are not sufficient for a complete understanding of population development of the Romanian minority community.

Our researches suggest that ethnicity and identification by use of the Romanian language as their mother tongue, is more objective and stable category of their ethnic identification in relation to the subjective criterion of belonging to the Romanian national minority. Native language, as an important ethnic determinant is largely based on objective factors than is the case with nationality, because of the subjectivity of the criteria when declaring. Registered degree of discrepancy between ethnicity and mother tongue of Romanians is an indicator of the intensity of assimilation and integration processes in the Romanian ethnic minority in Serbia. It should be added to all this, the existence of the
Christian-Orthodox religious identity, as we have already pointed out, whose role in the life of the Romanian community is not for ignoring.

The lack of statistical data on the natural movement of the Romanian population, reproduction, different types of migration flows, changes in the demographic, economic and social structure of the population, the number, size and characteristics of marriages, families, households and settlements, encourage us to propose the implementation of a new ethno-demographic survey of Romanians in the Republic of Serbia, which will take the form of systematic, gradual and deeper scientific researches. Such researches will be aimed at gaining highly valuable theoretical and methodological analysis and compliance with previous researches. In order to facilitate the learning of this thematic specialty, so as to expose the various methods and measures, it is necessary to include the Romanists, demographers, anthropogeographers, ethnographers, historians from Romania, as well as outlining of bilateral scientific cooperation between Serbia and Romania.

The Government of the Republic of Serbia and the Government of Romania must recognize that scientific cooperation must be based on mutual benefit. Taking our accumulated experience of closeness of the Serbian and the Romanian people, as well as a high level of scientific thought in both countries, we believe in the future bilateral cooperation on this project, with the aim of internationalization of this topic.

6. CONCLUSION

Because of the fact that, Romanians, since ancient times, have been an integral part of the multi-ethnic structure of the population in the Republic of Serbia, and that they now live in 138 settlements in Serbia, we have become deeply interested to introspect, in a complex way, the paradigms of ethno-demographic process of the Romanian ethnic minority, in a time frame of 63 years, from 1948 to 2011 year. The main ethno-demographic findings point to complex demographic changes of the Romanian minority in Serbia through: total reduction of the population, ageing of the population, assimilation, integration and the creation of specific form of identity. The territorial distribution of the Romanian population has not changed and it is under the direct influence of geographic distribution of Romanians formed through a very long historical period of existence in the territory of the Republic of Serbia. Within the study of the Romanian population in the Republic of Serbia, a question arises concerning Vlachs. Vlach and Romanian in eastern Serbia are two names for the same people, and so that should be acknowledged in all documents and public procedures. Bearing in mind the long-term trend of depopulation of the Romanian community in the past, and all the factors that conditioned changes in the Romanian population, by population projections we have predicted that the depopulation trend will continue in the future, till 2041 year. During the centuries of existence in Serbia, Romanians have formed a specific form of identity. Romanians still consider themselves an integral part of the Serbian society, so that their dual identity, and in these recent times is expressed as the identity of citizens who are integrated into the state in which they live, and who do not give up their national-Romanian identity. The applicability of the research results and findings has multiple benefits. Primarily in understanding the demographic complexity of the Romanian community; in the implementation of the population policy of the Republic of Serbia; in operational sustainability of the Romanian minority community through a clear policy, focused on the development of the Romanian population, preservation and
Ethno-demographic processes of the Romanian Minority in Serbia in 1948-2011

promotion of youth and the new generation, and in the existence of education in the Romanian language at all levels, development of the means of mass communication in the Romanian language, and development models, and in creating a sense of general well-being of the population in Serbia. Studies have prompted us to propose the implementation of new ethno-demographic survey of Romanians in the Republic of Serbia in order to obtain highly valuable knowledge through theoretical and methodological analysis and compliance with previous research. It is necessary to include Romanists, demographers, anthropogeographers, ethnographers, historians from Romania, and to outline bilateral scientific cooperation between the Government of the Republic of Serbia and the Government of the Republic of Romania. Knowing the acquired experience of closeness between the Serbian and the Romanian people, as well as a high level of scientific thought in both countries, we believe in bilateral cooperation on the project, in order to internationalize this topic.

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Raduški Nada, (2013), Ethnic processes and national minorities in Serbia after the 2011 census, New Serbian Political Thought


Web domain


Bureau of Statistics of the Republic of Serbia:
THE MAIN AGRICULTURAL LAND DEVELOPMENT AND IMPROVEMENT WORKS NECESSARY TO BE IMPLEMENTED ON THE LUGOJ HILLS AREA

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Abstract. The qualitative reclamation of the agricultural land can be achieved using two types of actions: land improvement works and agro-pedoameliorative works. The main remedial actions necessary for the Lugoj Hills agricultural land are: the flood control, the surface and the deep drainage, the irrigations, the erosion control works, the deep loosening and the ameliorative fertilization. The paper aims to map the precise location where these works must be implemented and to represent the percentage of the agricultural land targeted by them.

Keywords: land improvement, agro-pedoameliorative works, agricultural land, to map, Lugoj Hills

1. INTRODUCTION

The optimum use of land for agricultural activities or different other purposes is, mostly, restricted by one or more of the negative acting features of soil and/or environment. For these ones, in the specialized literature, the terms of limiting or restrictive factors are used. When their influence reaches a very high intensity, they can determine even the exclusion of an agricultural culture from a certain territory. In this case, they transform it in eliminatory or exclusive factors. Florea (1997) affirms that the limitations should not be confused with land degradation which is strictly caused by the human action.

There are two categories of limitations differentiated according to the possibility of intervening or not on their action for reducing them partially or completely. So, we can remark the existence of the absolute or incorrigible limiting factors, like for example air temperature, high slope, reduced available edaphic volume, land covering with rocks or stones and so on, and corrigible limiting factors, like water excess, soil salinization etc. which can be improved by different technological actions (Florea, 2003).

Karlen et al. (1997) mention that the land has a specific ability to optimally function at the boundary between the natural ecosystem and the artificially created one by the agricultural technological systems.

By applying the development and/or improvement works, some negative land features, from the agricultural point of view, are corrected or removed which requires the reduction or elimination of the penalties introduced by the restrictive factors. Following this operation, the land must be reclassified in relation to the way in which the remedial measures modify their current quality estate.
Main agricultural land development and improvement works in Lugojului Hills area

The remedial actions applied on the agricultural land are divided in land improvement works and land agro-pedoameliorative works and they are chosen according to the nature and intensity of the limiting factors, as well as to the available financial and technical resources and to the intended purpose.

Bold et al. (1984) demonstrate that the application of correct technology soil tillage, of segetal vegetation and pests control, of use of plants varieties and hybrids with superior biological qualities, of adequate and balanced doses of fertilizers and amendments determine growing crops per hectare. The authors illustrate this statement by the wheat and corn production realized in Romania on the best fields, but under different technological conditions. So, in the 50s of the past century, the wheat production was about 3-3.5 t/ha, and the corn production about 4.5-5 t/ha. In the 80s, in the same climatic and soil conditions, but with far superior varieties and hybrids and an improved technology, the production increased to 6-7 t/ha for wheat and 8-9 t/ha for corn.

2. MATERIALS AND METHODS

The Lugoj Hills are a part of the Western Hills of Romania, the Banat Hills sector, being situated in the eastern end of the Timiş County and having a surface of 61,903 ha out of which almost three quarters (74 %) representing agricultural land with a total surface of 45,828 ha (tab. 1).

Table 1: The land use in the Lugoj Hills area

<table>
<thead>
<tr>
<th>Land use</th>
<th>Surface (ha)</th>
<th>Percents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural land</td>
<td>45,828</td>
<td>74.00</td>
</tr>
<tr>
<td>Built-up areas</td>
<td>2,710</td>
<td>4.37</td>
</tr>
<tr>
<td>Forest</td>
<td>13,043</td>
<td>21.07</td>
</tr>
<tr>
<td>Surduc Lake</td>
<td>322</td>
<td>0.56</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>61,903</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

The working methodology consisted in studying the materials executed over time by experts of Timișoara Soil Science and Agrochemistry Service, processing different cartographical materials (pedological, topographical, geomorphological, geological) and interpreting of the analytical data on identified limiting factors. The obtained results have been validated also by some field activities.

The results had as support the Banat soils map, on scale 1:100,000, made by Gh. Ianoș in 1994 and published four years later (Ianoș and Pușcă, 1998), from which the soil units corresponding to the Lugoj Hills area have been extracted. The names of the soils have been adapted to the new Romanian Soil Taxonomy System-SRTS 2012 (Florea and Munteanu, 2012). The ecologically homogeneous territories (TEO – in Romanian) have been established for the soil units of the researched area. The TEOs features have been introduced into a digital database created in ArcGIS 10.0 software and the measures for
3. RESULTS AND DISCUSSIONS

Soil fertility degradation flows rapidly in terms of some inadequate agricultural activities conditions or some improvement works without a proper scientific foundation. To these, it can be also added the low natural fertility due to an improper water and air circulation, to a low content of humus and nutrients, to a pronounced acidification or to ground etching through denudation processes (Mazăre, 2006a).

The main land development and improvement works necessary to be realized on some terrain units of the agricultural area of the Lugoj Hills will be presented below. It must be mentioned that, in the figures that show the spatial distribution of the processes, there are found graphic charts presenting the percentage of the affected areas that require such curative actions of the total agricultural land.

3.1. Land improvement works

All the long term works executed in order to improve the features of an agricultural field belong to this category. They help to increase the land productivity, to protect their lands and cultures against the damages that can be caused by some natural elements and help to reduce the cost production (Vlăduț and Popescu, 2000).

The land improvement actions, named also hydro-improvement actions, include the irrigation works, the regulation and damming of watercourses, the surface and deep drainage, the seepage, the erosion control works, the terracing sloping land and landslide areas etc. By applying these works, the natural production conditions are changed for a long period of time, creating new ones that promote the adaptation and productivity of plant organisms. Overall, the land improvement works fail to completely resolve the problems induced by the restrictive existing factors. They only create the necessary conditions for some future remedial actions as a base for the implementation of the agro-pedoameliorative works (Ianoș et al., 1997).

3.1.1. The flood control by the regularization and damming of watercourses

The purpose of these works is to protect the fields against the flood. So, the restrictions imposed by the ecopedologic indicator inundation are partially or completely removed.

The first regularization and damming works of the watercourses from the Lugoj Hills area were started more than 250 years ago. Even so, the entire territory is not yet fully protected against the flood. For example, in April 2005, large land areas, belonging to 15 settlements from the Lugoj Hills area, were flooded. The inundations were due to the freshets produced in the valleys of Bega, Timiş and Gladna rivers. Ianoș (2008) specify that the relief configuration determined the expansion of the waters damaging effect only on some well-defined sectors.
Main agricultural land development and improvement works in Lugojului Hills area

The surface appreciated as exposed to the rivers overflow and which needs to be protected by such improvements is of 7,324 hectares (fig. 1), meaning 15.98 % of the entire agricultural land of the researched relief unit.

![Fig. 1. The agricultural land of the Lugoj Hills requiring regularization and damming of watercourses.](image)

3.1.2. Seepage and surface drainage works

The surface drainage aims to eliminate the negative influence induced by the stagnation on the soil surface of the water coming from rainfall or other non-phreatic sources.

The elimination of the water excess from the soil surface determines also the improvement of the soil pseudogleyzation condition.

For the researched territory, the surface drainage could be done separately or together with the seepage works. 27,461 hectares (approx. 60 % of the Lugoj Hills agricultural land) require such works (fig. 2).
3.1.3. Seepage and deep drainage works

This kind of works is carried out to lower the high groundwater level. With the decrease of the groundwater depth, the soil gleyzation condition is improved also.

The deep drainage needs to be carried out for 31.68 % (14,520 ha) (fig. 3) of the researched agricultural land, most of them without drainage application.

Lowering the groundwater level below the critical limit has been realized on the most part of the land from the meadow area of the Bega and Gladna rivers affected by the groundwater humidity excess. Mazâre (2006 b) states that a part of these works no longer properly carry out their mission, the channels being clogged with dejections and mud or being invaded by vegetation.
3.1.4. Anti-erosion works

The execution of the preventing and combating soil erosion manifest itself by minimization of the penalties induced by the indicators land slope and landslides.

Anti-erosion actions non-associated with works for removing the humidity excess are required for protect the agricultural land located in the high slope area. These fields account for less than 10% of the total agricultural land of the Lugoj Hills (9.25% – 4,240 ha) (fig. 4). Beside this type of works, measures against gully and torrent processes need to be done on a surface of 1,490 ha (3.25%) (fig. 5), and complex actions against landslides are required for 26.66% of the agricultural land (12,217 ha) (fig. 6).
Fig. 4. The agricultural land of the Lugoj Hills requiring anti-erosion works non-associated with removing the humidity excess works.

Fig. 5. The agricultural land of the Lugoj Hills requiring works against gully and torrent processes.
3.2. Agro-pedoameliorative works

This type of curative works aims also to positively change the production factors of the agricultural land and includes works that can be also assigned to the first category. But because of their cyclic nature and their reduced effect over time, they have been separately indicated (Bold et al., 1984). They usually complete the land improvement works without which they can not achieve their purpose.

These works are set out not only for the land covered by nonproductive or low productive soils, but for all areas which require such actions in order to obtain higher possible yields.

Ianoș et al. (1997) specify that the agro-pedoameliorative works can be grouped according to the required purpose in the next categories:

- own agro-pedoameliorative works – they include liming and plastering, the salts washing, the deep loosening, the subsoiling, the ameliorative fertilization, the fight against pollution;
- superficial drainage works – including the ditches and culverts for excess water drainage, grouped in systematic and unsystematic one, the mole-drainage, the ridge strips modeling, the obligatory agricultural machines working way in the direction of water flow;
- anti-erosion agro-technical works – grouping the plowing on the level curve, the anti-erosion system of crops in strips and the grass strips, the protective crop rotation, perennial grass crops.
From all these, for the Lugoj Hills area, the most important works are the deep loosening and the ameliorative fertilization. These actions are specific to the soil and they determine the improvement of its chemical, physical and biological features, affecting the soil profile on depths often exceeding the arable layer (Ap). Their effect has an average duration of 3-7 years, but often even longer (Niţu, 1988, 1990).

3.2.1. Deep loosening works
The deep loosening works are made without turning on the furrows, at depths of up to 60-80 cm, and they are executed with the agricultural machine called scarificator. For this reason, they are also named soil scarifying works. They are designed to improve the soil porosity, having as effect the amelioration of soil compaction. These works must be repeated on regular time intervals.

Ianoş et al. (1997) specify that the fields needing deep loosening works are those covered by illuvial soils having a high compaction. The fields located on areas with slope higher than 10%, those with landslides, the fields covered by vertisols and vertic soils and those covered by lithsoils and lithic soils, the lands with the phreatic level less than 1.5 m from the surface, the ones located on depression landforms, and also the areas with high and very high soil porosity and permeability are excluded from this type of works. Considering this, it appears that the deep loosening is necessary to be carried out on a surface of 4,834 ha (fig. 7), meaning 10.55 % of the Lugoj Hills total agricultural land.

Fig. 7. The agricultural land of the Lugoj Hills requiring deep loosening works.
3.2.2. The radical ameliorative fertilization works

The radical ameliorative fertilization must be done on the fields which have suffered natural or anthropogenic fertility degradation processes, lacking humus or having very low humus reserves. These remedial actions contribute in this way to the improvement of the land quality by increasing the soil organic material.

For the agricultural land of the researched region, the radical ameliorative fertilization should be carried out on a surface of 2,670 hectares (5.83 %) (fig. 8).

Fig. 8. The agricultural land of the Lugoj Hills requiring radical ameliorative fertilization works.

4. CONCLUSIONS

The anthropogenic intervention on the restrictive factors of the agricultural production could be done by the help of so called land quality enhancement works. There are two types of human remedial activities: those aiming the agricultural land development and those aiming the improvement of the agricultural land quality condition. Both types of works determine the decreasing of the restrictions imposed by different limiting factors or even their total removal.

In the context of some specific natural conditions and under the impact of the current agro-cultural works, the land from the Lugoj Hills area is affected by one or more restrictive factors due to the soil or environmental features.
The main curative actions necessary for the agricultural land of the Lugoj Hills are the following: flood control, surface drainage, deep drainage, land irrigations, erosion control works, deep loosening and ameliorative fertilization.

Identifying the areas targeted by the remedial actions and specifying their percentages of the total agricultural land of the Lugoj Hills are made in relation with the development and improvement works necessary to be realized. The spatial representation of the results offers a direct view, structured in an accessible style, easy to be observed and interpreted even by the non-experts.

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Abstract. The purpose of this paper is the biozonation of the Triassic klippes belonging to the Transylvanian Nappes from Rarău Syncline based on bivalves. The palaeontological and biostratigraphic study demonstrated that Fagețel klippe is Upper Ladinian age, because of the presence of *Daonella (Loemmelella) loemmeli* species and that in the Dealul Cailor klippe is the Ladinian-Carnian boundary, because the *Daonella* și *Halobia* genera have coexisted, which is possible only at the base of Carnian. A part of Dealul Cailor klippe belongs to Upper Ladinian, namely, the biozones with *Daonella (Pichlerella) Pichleri* and *Daonella (Loemmelella) loemmeli* and at least a part of Timon klippe belongs Upper Norian, because of *Monotis salinaria* species.

Keywords: bivalves, klippe, Triassic, Rarău Syncline, biostratigraphy

1. INTRODUCTION

Rarău–Breaza Syncline (Fig. 1) is located in the northern part of the Eastern Carpathians (Crystalline-Mesozoic Zone) corresponding, in terms of the global tectonics, to Median Dacides (Șândulescu, M., 1984). Within the Median Dacides, two types of nappes were separated: autochthonous (the Bucovinian, Sub-Bucovinian and Infrabucovinian Nappes) and allochthonous (the Transylvanian Nappes) (Grasu, C. et. al., 1995). In syncline sedimentary were identified only autochthonous formations belonging Bucovinian Nappes and allochthonous formations, that is Transylvanian Nappes (Mutihac, V. & Mutihac, G., 2010). Transylvanian allochthonous sedimentary takes the form of sedimented blocks in the Wildflysch Formation of bucovinian sedimentary as covering patches belonging to Transylvanian Nappes and in the form of some slight reduction klippes (Mutihac, V. & Mutihac, G., 2010).

Triassic is the first period of the Mesozoic Era following the extinctions at the end of the Permian Period (Atanasiu, N. et. al., 2007) and ranging between 252 and 201 million years (http://www.britannica.com/EBchecked/topic/604667/Triassic-Period, 23.11.2013). In Rarău Syncline, Triassic present in the Transylvanian klippes consists of calcareous deposits (Grasu, C. et. al., 1995), researches being done since the nineteenth century, the most important contribution is due to Paul C. M., Mojsisovics E., Uhlig V., Kittl E., Patrulius D., Popescu Gr., Mutihac V. and Turculeț I. (Turculeț, I., 2004).
2. MATERIALS ŞI METHODS

There were performed both field and laboratory studies for the biostratigraphical study of the Transylvanian Triassic from Rarău Syncline. Identification and prove of the main Triassic klippe were conducted during the summer of 2011, studying mainly bivalve fauna.

Dozens of samples of the following klippe were taken following the field trips: Făgetel, Piatra Zimbru, Dealul Cailor, Timon, and from the Eotriassic klippe Dealul Runc-Valea Seacă were taken only petrographic samples. Processing the samples in the laboratories of Geology - Geochemistry Department was quite difficult, as there was only a chisel and a hammer, rocks being hard, some showing calcite diaklas, cracks and so on, they prevent the complete detachment of fossils. In other cases, morphological characteristics were not well preserved which required reservations in the specific determination of the taxons.

After determining the species, biostratigraphical value of bivalves was interpreted following McRoberts paper (2010).
3. BIVALVES FAUNA

Valea Seacă klippe (Lower Triassic) is located north-east of the Dealul Prasca, south-southwest of the Dealul Runc and grows almost 120 m long and 15 m high, being made up of the following types of rocks: quartz-siltstone-sericitic marls, of gray-green colour, clay-quartz-siltstone limestones, lime green or gray colour and light gray proper limestones, very fossiliferous (Turculeț, 2004). In this fossiliferous point the following species have been described: Costatoria costata (Zenker), Trigonodus sandbergeri (Albert) and Entolium discistes (Schlotheim) (Turculeț, I., 2004, Plate I).

The klippe from Dealul Cailor (Middle Triassic) is located at about 370 meters from the entrances of some old mines (situated between Dealul Cailor and Dealul Râchitiș), down the slope, toward Pârâul Cailor and is represented by a red and yellow limestones block, 8 meters long, 7 meters wide, 3 meters high and is surrounded by many small blocks with a diameter of less than 1 meter, coming from the large block (Turculeț, I., 2004). Here were discovered bivalve species such as Camptonectes (Annulinectes) concentricus-triatus (Hoernes), Daonella (Loemelella) loemelli Wissmann, D. (Arzelella) indica Bittner, D. (A.) bulogensis Ktül, D. (A.) tripartita Ktül, D. (Pichlerella) pichleri (Gümbel), Posidonia wengensis Wissmann, Halobia austriaca Mojsisovics, H. bukwinensis Ktül (Turculeț, I., 2004, Plates II, III and IV).

The white-gray limestones klippes from Piatra Zimbrului-Todirescu area (Upper Triassic) can be found in Rarău Plateau area containing neo-Triassic fossil remains (Turculeț, I., 2004). Species have been identified as: Daonella (Arzelella) indica Bittner, D. sp., indeterminable bivalve fragments (Turculeț, I., 2004, Plates III and IV).

The klippe of red limestones from Ciungi - Timon (Upper Triassic) is located in the upper basin of the Timon creek on the left side of it (Turculeț, I., 2004). There have been discovered species in this place such as Monotis salinaria (Schlotheim), M. sp. (Turculeț, I., 2004, Plate IV).

The klippe from Pârâul Fâgetel (Upper Triassic) is located on the left bank, from middle basin of Fâgetel creek, with about 2.5 meters long and 1 meter high, being made up of massive gray limestones. It was discovered species such as Daonella (Loemelella) loemelli Wissmann, Entolium praemissum (Bittner) (Turculeț, I., 2004, Plates I and II).

4. BIOSTRATIGRAPHICAL INTERPRETATION

From the defined associations it is noted the frequency of Daonella, Halobia and Monotis species.

Daonella is the most common genus, being found in three klippes of Transylvanian origin, that are: Dealul Cailor, Piatra Zimbrului and Fâgetel (Fig. 2). Note that this discovery is made for the first time in the last fossiliferous point, Fâgetel. The species identified were: Daonella (Loe Mueller) loemelli, D. (Arzelella) indica, D. (A.) bulogensis, D. (A.) tripartita, D. (Pichlerella) pichleri. From McRoberts biozonation (McRoberts, C. A., 2010), Daonella is expanding on the Anisian-Carnian period (Fig. 2). In the case of Dealul Cailor klippe, Turculeț considers, based on ammonites also, that the Ladinian Stage
is present in the main klippe and possible transitions in the Carnian Stage, reported in smaller blocks down the slope of the Părâul Cailor (Turculeț, I., 2004, Plate IV, fig. 2).

Considering the association between the samples from the southern part of the klippe from Dealul Cailor, of *Daonella* and *Halobia* species (Plate IV, fig. 2), follows that also in the main klippe there is a Ladinian-Carnian boundary (Fig. 2) and small blocks reported by Turculeț (2004) come from this also.

![Fig. 2. Biozonation of Triassic based on bivalves](McRoberts, C. A., 2010).

From the determined association results that the klippe from Dealul Cailor are present taxon index Biozones with *Daonella* (*Pichlerella*) *pichleri* and *Daonella* (*Loemmelella*) *loemmeli*, fact noticed also in the collected samples where they never appear together (Fig. 3).
Fig. 3. Biozonation of Middle and Upper Triassic based on index species of bivalves (McRoberts, C. A., 2010).
**Transylvanian Triassic biostratigraphy from Rarău Syncline Based on Bivalves**

*D. (P.) pichleri* forms a very obvious and easily recognisable in the field of lumachelle in the north side of klippe, and *D. (L.) loemmeli* appears together with other molluscs (6 specimens) in different levels between 3-9 centimeters.

Large specimens of *D. (Arzelella) tripartita* were reported above the level with *D. (P.) pichleri*, *Daonella (Arzelella) indica* specimens were collected from under Piatra Zimbrului, from a basal level more unclear defined in relation with the main part of klippe.

A particular specimen of *D. (L.) loemmeli* was identified for the first time in Făgșetel klippe, where no clear stratification of limestones is observed, and for a bizonation more data is required.

*Halobia*, in McRoberts (2010) conception, is an index genous for Carnian-Norian (Fig. 2). In the samples collected, were identified only two species, these are *H. austriaca* and *H. bukowinensis* (which has the holotype from Rarău Syncline, on Izvorul Malului), that have a longer period of existence, for the base of Carnian, McRoberts (2010) suggesting as index species *Halobia rugosa*.

*Monotis* genous (Fig. 2) is often found in the Norian klippe from Ciungi (Pârâul Timon), where it appears in lumachelles of small thickness, many times being hard to detach entire valves. After the determinated species, *Monotis salinaria*, the Norian age is unquestionable (McRoberts, C. A. et. al., 2008).

Other defined bivalve species have no special value from a biostratigraphical point of view, except the *Costatoria costata* species, which, according to Turculeț (1971) would mark Lower Triassic. The other species have a broader spectrum of existence, *Entolium* genous crossing also in Jurassic (Turculeț, I., 2004).

### 5. CONCLUSIONS

Following the paleontological and biostratigraphic study regarding the main Triassic klippes belonging to Transylvanian Nappes, a klippe of small dimensions (2.5 meters long and 1 meter high) was discovered at Pârâul Făgșetel which belong to Upper Ladinian due to the *Daonella (Loemmelella) loemmeli* species.

It was also proved that in the Dealul Cailor klippe there is Ladinian–Carnian boundary, because the coexistence of *Daonella* and *Halobia* genous was noticed in the collected samples from the downstream side, which is possible only at the base of Carnian, according to the biozonation proposed by McRoberts (2010). It is therefore possible that the blocks from the Pârâul Cailor, split as distinct by Turculeț (2004) and assigned to Carnian, to be detached from the main klippe.

The biggest part of the klippe from Dealul Cailor belongs to Upper Ladinian, namely, Biozones with *Daonella (Pichlerella) pichleri* and *Daonella (Loemmelella) loemmeli*, these two species are not found together in the collected samples.

Upper Norian was determined for at least a part of Timon klippe based on the *Monotis salinaria* species.

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Fig. 2 Trigonodus sandbergeri (ALBERT, 1864); Induan-Olenekian, Valea Seacă klippe, I. Turculeţ collection.
Fig. 3 Entolium discites (SCHLOTHEIM, 1820); Induan, Valea Seacă klippe, I. Turculeţ collection.
Fig. 4 Entolium praemissum (BITTNER, 1901); Ladinian, Făgățel klippe.
Figs. 5, 6, 7, 8 Posidonia wengensis (WISSMANN, 1841); Ladinian, Părăul Cailor klippe.
PLATE II

Figs. 1, 4, 5, 6 Daonella (Loemelella) loemmeli (WISSMANN, 1841); Ladinian, Dealul Cailor klippe.
Figs. 2, 3, 7 Daonella (Loemelella) loemmeli (WISSMANN, 1841); Ladinian-Carnian, Dealul Cailor klippe.
Fig. 8 Daonella (Loemelella) loemmeli (WISSMANN, 1841); Ladinian-Carnian, Făgetel klippe.
Fig. 9 Daonella (Arzelella) bulogensis (KITTL, 1912); Ladinian, Dealul Cailor klippe.
Fig. 1 *Daonella (Arzelella) tripartita* (KITTL, 1912); Ladinian, Dealul Cailor klippe.
Figs. 2, 3 *Daonella (Pichlerella) pichleri* (GÜMBEL, 1873); Ladinian-Carnian, Dealul Cailor klippe.
Fig. 4 *Daonella* sp.; Ladinian-Carnian, Piatra Zimbrului klippe.
Figs. 5, 6 *Daonella (Arzelella) indica* BITTNER, 1899; Ladinian-Carnian, Piatra Zimbrului klippe.
Fig. 1 Indeterminable bivalves; Ladinian-Carnian, Piatra Zimbrului klippe.
Figs. 2, 2a, 4 Halobia (Austrihalobia) austriaca (MOJSISOVICS, 1874); Ladinian-Carnian, Dealul Cailor klippe.
Figs. 3, 3b, 6, 6a Halobia (Austrihalobia) bukowinensis (KITTL, 1912); Ladinian-Carnian, Dealul Cailor klippe.
Figs. 3a, 5, 6b Camptonectes (Annalinctes) concentricus-striatus (HOERNES, 1855); Ladinian-Carnian, Dealul Cailor klippe.
Figs. 7, 9 Monotis sp.; Norian, Timon klippe.
Fig. 8 Monotis salinaria (SCHLOTHEIM, 1820); Norian, Timon klippe.