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**Ph.D.THESIS**

**- SUMMARY –**

**THE BÂRGĂU MOUNTAINS.**  
**A STUDY IN HUMAN GEOGRAPHY**

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## INTRODUCTION

The approach from a geographic and human perspective of the Bârgău Mountains comes a decade and a half after the publication, in 1999 of the thesis *The Bârgău Mountains . A Physical-geography study*, of Eugen Rusu from the Faculty of Geography, University "Al. I. Cuza", Iași. In order to complete the picture of this mountain space, geographically unique in its own way, it was necessary, undoubtedly, such an approach, taking into account the fact that the Bârgău Mountains is a social-economic and cultural space with some representation in the national territorial assembly.

The subject of this paper discusses one of the natural units of the Eastern Carpathians (Maramureș and Bucovina Carpathians) has hardly been studied from the perspective of human geography, a geographical area that is distinguished by a unique way of combining the elements of the environment.

Choosing the Bârgău Mountains as a research theme had at first a subjective side as during high school we could admire from the window of the geography cabinet of the INFOEL Technical College in Bistrița the subvolcanic rock of the Heniu Massif. Later, studying human geography scientific literature of this space mountain, we discovered its incomplete nature, only in the late twentieth century and at the beginning of our century there were published the first comprehensive studies that included the territory of the Bârgău Mountains. It is the study of the historical geography of the Năsăudean Border Regiment developed by Mircea Mureșianu (2000) and the study of regional geography of *Năsăudului Land* by Oana-Ramona Ilovan (2007). It should be mentioned the wealth of works and articles covering the history of these places, the pride of the human geography researcher being, thus put to work in drawing the entire humanized landscape of the Bârgău Mountains.

This study is the result of a decade of concerns in the domain and is the first comprehensive geographical approach, in terms of human geography, of the Bârgău Mountains. In conducting this research, we started from the need for detailed knowledge of the realities of this territory, aiming always to detect what is essential, namely, how the habitat evolved, demographic and economic phenomena, their degree of complexity, their manifestations in territory and their evolution.

## 1. THEORETICAL AND METHODOLOGICAL ASPECTS

When starting to investigate an area from the human geography perspective, it requires, above all, to establish the principles and methods of work, which is "an indispensable operation certifying, on the one hand, the scientific status of the branch of science concerned and on the other hand, provides the tools necessary to complete the research desiderata "(Cocean, P., 2002).

Processes and phenomena of the geographic reality are subject to four basic principles: *spatiality, causality, integration and historicism*.

*The principle of spatiality* (called by Emm. de Martonne the principle of extension) is characteristic of the geographical science in general, and human geography in particular, answering the question: *where?* According to him, any object, process or geographical phenomenon occupies a position in the territorial assembly, depending on which geographical are explained and represented. A fundamental feature of the space is reversibility, in the sense that any object can return to a previous position. The space "*expresses the relations between objects and phenomena or between their parts, through its length, distance, location*" (Ilinca, N., 2000).

When studying a territory a systemic approach is required, which should start from taking into consideration the following aspects: space must be considered in its entirety; space is produced by humans, and this product is dependent on different constraints (natural, historical, financial) and resources (material, human).

*The principle of causality* introduced in geography by Al Von Humboldt, expresses the relationship between cause and effect, where there should be a report of necessity. Identifying the causes of processes and phenomena confined to the sphere of human geography is absolutely mandatory step in trying to find satisfactory answers to questions that arise during the research the geographical reality. The numerical evolution and the density of population, the quality of population, the formation and evolution of the networks of settlements, the economic activities, the distribution of communication routes, tourism potential, etc., are conditioned not only by the specificities of the natural landscape but also by the social and historical context and often political, in which it manifests. Thus, there is always the need to take into account the contribution of all conditionings, but also to choose, in order of importance, the highest level of influence. It is from the part of human geography researcher, an act of great responsibility, as "any omission or error to estimate, meaning undervaluation or overvaluation in some cases, can lead to inaccurate factual conclusions."

*The principle of integration* answers the question "how?" because any object, phenomenon and geographic process must be reported to the territorial unit to which they belong. Therefore, it is necessary to be determined the role of the entire system and the actions and influences, made or supported by other elements of geosystem.

*The principle of historicism* reflects the role that the time factor plays in the genesis and evolution of geographic processes and phenomena. In the field of human geography, as, indeed, in other branches of geography, time leaves directly its footprint on the population components, habitats and economic activities. Also, in interrelation with these elements, the parts of the natural landscape are formed and evolve over time (understood as duration).

Depending on the techniques and methods used were made different types of statistical charts and cartographic representations:

- To highlight the series of distribution: *curve diagrams, quantitative distribution diagrams (the structural pyramid of population by age and sex), diagrams in shape of structural circles;*
- To highlight the time series: *chronological diagrams (cronograms or hystoriograms), diagrams in column and diagrams in strips (histograms);*
- To highlight the chronological series: *cartograms (by points, colours, shadings, isolines) and cartodiagrams.*

This allows the analysis and representation of an extremely broad spectrum of processes, phenomena, correlations, trends in the evolution of the geographical environment components. Also, there are expressive means of completing the scientific text, serving to enhance its intrinsic value.

## **2. THE SCIENTIFIC LITERATURE ON THE GEOGRAPHY OF THE BÂRGĂU MOUNTAINS**

Although they are a small territorial assembly, only 4% of the entire edifice of the Eastern Carpathians Bârgău Mountains, through the variety and complexity of geographical issues have aroused a great interest since the nineteenth century, both for researchers in the field of physical geography, but also for those interested in the interplay between anthropogenic and the natural environment component. If in physical geography, there is a large study, in 1999, the PhD thesis of the author Eugen Rusu, from the Faculty of Geography, of the "Al. I. Cuza "University, from Iași - *The Bârgău Mountains. A physical geography study*, in the area of human geography at least so far, have been presented only

works that only partially treated this mountain unit either in territorial terms or in terms of the issues addressed, this mountain unit.

It came therefore as a need to focus on the human geographic aspects of the entire Bârgău Mountains space. At the end we have completed our study with the elaboration of this paper that captured the fundamental aspects of yesterday and today's human geography of the Bârgău Mountains, aiming at the same time, on the basis of the existing realities in the territory in the first decade of the XXI century, to outline the main trends and directions of development of the human component in direct and immediate relationship with the environmental aspects of the unit.

In terms of the geographical research history of the Bârgău Mountains there can be detected two distinct phases, corresponding to the three centuries of study and research on mountain region: pioneering stage (covering the nineteenth century) and the stage of major studies and research (covering the twentieth century and the beginning of our century).

a) *The pioneering stage* starts in early nineteenth century and includes exclusively research studies on the geology of the Bârgău Mountains area.

b) *The stage of major study and research* covers the entire span of the twentieth century and the beginning of our century, which stands out due to the increasing number of studies and individual research on the geography of the Bârgău Mountains and also due to the emergence of a significant number of synthesis works that include references on the Bârgău Mountains area.

The human geography of the Bârgău Mountains has not attracted a great interest from the geographers of the past century, few studies being devoted to this mountain space. Among them, we can mention the papers: *Bîrgău – Touristic guide*, published in 1987, signed by the geographers Tr Naum and Gr. Moldovan, where are briefly presented, the geography of this mountainous area, focusing obviously on the tourist attractions and touristic trails of the Bârgău Mountains.

Grigor P. Pop presents in his work of *România. Hydropower Geography*, published in 1996, the planning stages of Bistrița River, with its two main objectives: the dam and the reservoir of Colibița, its central aim being to obtain electricity and water supply for Bistrița, and other rural settlements in the region. With this objective being finalized there took place a *"lift on the slopes of some of the households of the village Colibița creating at the same time, a new touristic value for the area, including in the mountain resort from this place."* (Pop, Gr, 1996)



In 1997, there is an extensive study of human geography over the entire area of the Carpathians. It is the doctoral thesis of professor doctor Nicolae Ciangă - *Tourism in the Eastern Carpathians. A study of Human Geography*. The Bârgău Mountains area is found in the paper, in its different chapters. There are analyzed: the tourism potential of the volcanic landscape ("Magura" in Bârgău), the touristic lakes (Lake Colibița), the anthropic tourist resources (black pottery from Josenii Bârgău and Prundu Bârgău), the mountain resorts (Colibița and Prundu Bârgău), the density of the accommodation. In the chapter *Tourist Zones*, the author includes the Bârgău Mountains in the Năsăud-Bârgău area, subzone Bârgău.

At the turn of the millennium, in 2000, it was published the study of historical geography signed by Mircea Mureșianu - *Năsăudean Border District (1762-1851)*. A study of historical geography, in which the Bârgău Mountains were covered too, as it was, according to the geographical and historical reality, part of the district. Therefore, in addition to the geographical and physical premises there are also analyzed the human geography elements, seen clearly from the perspective of historical geography.

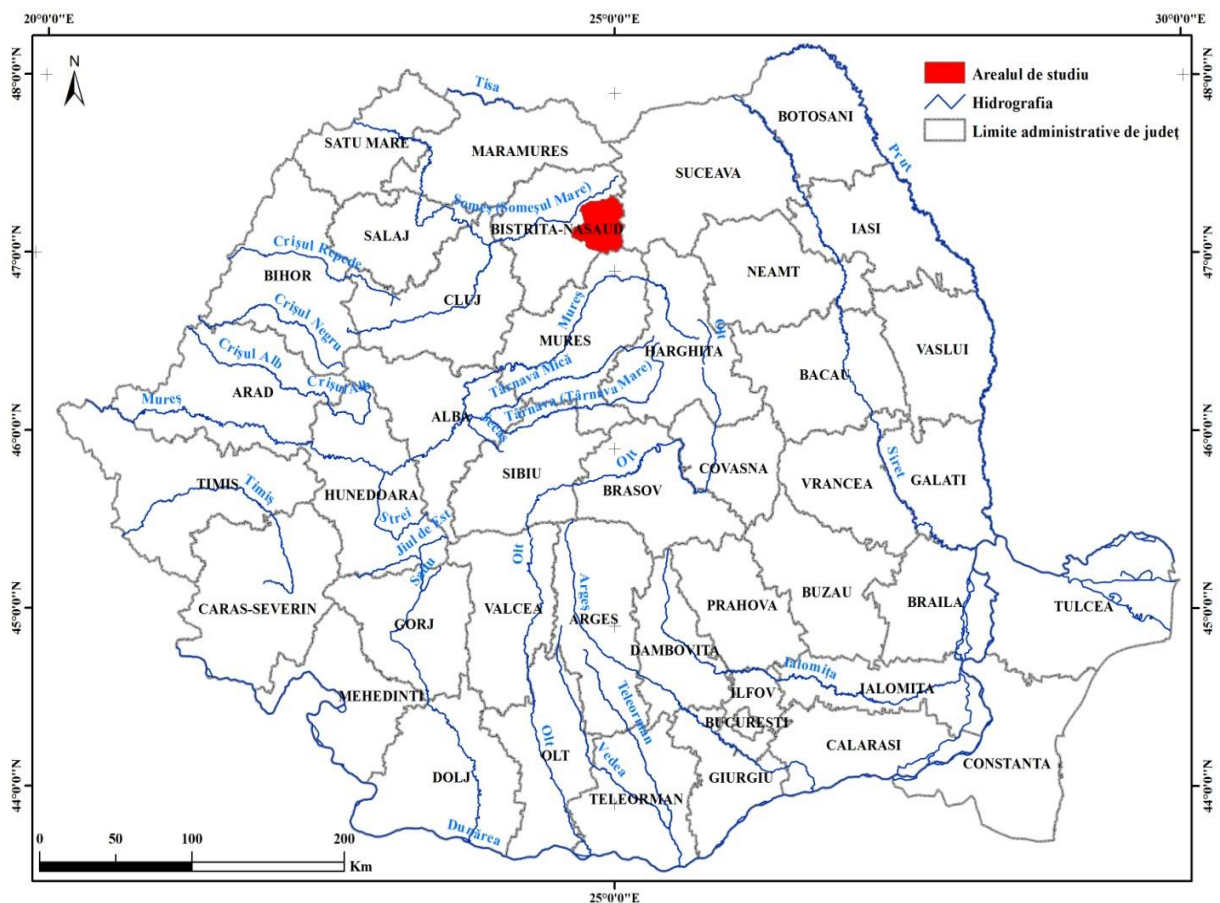
The only study of regional geography which includes the northern sector of the Bârgău Mountains was published in 2007 under the signature of Oana-Ramona Ilovan. *Năsăudului Land. A regional geography* addresses the specific issues of this Transylvanian space in terms of regional geography. The northern area of Bârgău Mountains (Valea Ilvei, Valea Leșului) are analyzed in detail under the aspects of physical and human geography, aspects distilled in the regional synthesis.

### **3. THE GEOGRAPHICAL INDIVIDUALITY OF BÂRGĂU MOUNTAINS**

The Bârgău Mountains are located in the north-central part of Romania (Fig.1), on the west façade of the Eastern Carpathians Mountains. These mountains have a low to medium altitude and are situated between two high altitude massifs in the north and south, the Rodna and Călimani Mountains. To the west and east, there are two low areas, depressions, that is the Transylvanian Depression and the Dorna Depression.

According to the taxonomy made by V. Mihailescu (1963), these mountains belong to the rank 5 mountain units category (the Romanian Carpathians are rank 1, the Eastern Carpathians are rank 2, The Northern Group or the Bucovina and Maramureș Carpathians are rank 3 and the Bârgău –Dorna- Valea Moldovei are rank IV).

The mathematical coordinates that the Bârgău Mountains have in their extremes are: the parallel 47°08'30" N (in the south), passing through the southern part of the Colibița Basin, the parallel 47°29'10" N (in the north), which marks the confluence between Maria stream and Someșul Mare, the meridian 24°36'10" E (in the west), crossing Culmea Frășișului and the meridian 25°08'40" E (in the east), on the outskirts of Măgura Coșnei. Between these limits, the Bârgău Mountains cover an area of 1307 km<sup>2</sup> of the 34 549 km<sup>2</sup> of the Eastern Carpathians, which represents about 4% of the Eastern Carpathians surface.



**Fig.1. The Bârgău Mountains. The location within the national territory**

The limits of the Bârgău Mountains and their relations with the neighbouring units were established based on a complex of physical-geographic criteria. Of major importance remain the geological and geomorphological criteria because the other geographical and physical criteria (*bio-pedo-climatic ones*) overlap in the areas of interference, increasing the difficulty on clearly establishing the limits.

If the natural boundaries are relatively easy to trace, at least there where the morphological and / or geological discontinuities are clear, *the functional boundaries* raise greater difficulties in their establishing. On one hand, the anthropogenic component of a given

territory through its essential character, the mobility, gives that space new meanings, depending on the specific of the activities, the intensity of the material, energy and information flows, the changes, over time, of the administrative boundaries and so on. On the other hand, the formation of initial habitation nuclei and the increased demographic pressure on a space with limited agricultural resources, led to significant population movements from the first habitation nuclei to areas used initially only seasonally. Therefore, the *swarming phenomenon* present in the Bârgău Mountains area in its two forms, *displacement* and *saltation*, contributed decisively to the territorial spread of the population and to a permanent modification of the functional limits, reflected in the humanizing of the natural environment.

The administrative limit of the Bârgău Mountains, which doesn't overlap almost at all the natural limit, some absolutely necessary clarifications have to be made in order to remove ambiguities related to the extension of the territory studied. Therefore, in the north, the administrative boundary is located south of the natural boundary and follows the boundary between the ilvene communes (Lunca Ilvei, Ilva Mare, Magura Ilvei, Poiana Ilvei and Leșu) and the administrative units in the north, whose surfaces extend both in the Rodna Mountains and in the Someșul Mare Corridor and in the northern Bârgău Mountains area. These are the communes of: Șanț, Rodna, Maieru and Sângeorz Băi. Since the precincts of these settlements are located in the Someșul Mare Corridor, the population of these localities do not belong to the Bârgău Mountains area this being true also for the inhabitants of Ilva Mica (in the same corridor mentioned above) and of the communes in the eastern Bârgău Mountains, whose precincts have developed in the area of the Dorna Depression.

Also in the south and southwest, the administrative limit does not overlap the natural boundary, part of the territory of the communes Josenii Bârgău and Prundu Bârgăului overlapping the Dealurile Bistriței area, while Bistrița Bârgăului expands its estate on the northern slopes of the Călimani Mountains.

Therefore, the administrative units whose surfaces are located entirely in the area of the Bârgău Mountains are those in the northern half (Poiana Ilvei, Magura Ilvei, Ilva Mare, Lunca Ilvei and Leșu), while the communes in the southern part of the mountain unit (Josenii Bârgăului, Prundu Bârgăului, Tiha Bârgăului and Bistrița Bârgăului) have surfaces, larger or smaller, as part of the surrounding relief: Josenii Bârgăului and Prundu Bârgăului in Dealurile Bistriței, and Bistrița Bârgăului and Tiha Bârgăului in the Călimani Mountains.

If the natural premises constituted the base of the settlement of the population and of gradually shaping the settlements network, were presented in this study, taking into account the geographical and physical limits of the Bârgău Mountains area, the elements of human

geography (the population, the settlements and the economy) were analyzed within the administrative boundaries.

The exclusively rural character of the Bârgău Mountains, the presence of extensive areas of forest and grassland, the existence mineral springs and volcanic rocks for construction are some key elements of the space analyzed, reflected both in the peculiarities of the organization of the geographic space and on the territorial planning but also in the professional structure of the population, the conservation of some ethnographic and ethno-folk elements, reflections of the spirit in the Bârgău Mountains area.

#### **4. THE GEODEMOGRAPHIC CHARACTERISTICS**

The introspection performed on the geographical space of the Bârgău Mountains, regarding the geography of population, revealed a number of particular elements, determined by the conditionalities imposed by the orohydrographic landscape and the bio-pedo-climatic conditions and especially of the economic factors reflected in the way the anthropic system of the Bârgău Mountains constitutes and functions.

Thus, the presence of two major morpho-hydrographic axis (Tiha-Bistrița and Ilva-Leșu) was the major factor that contributed to the development of the initial habitation nuclei. The alternation of depression basins with narrow sectors (Strâmturi) of the Bârgău valleys (Ilva, Leșu, Tiha and Bistrița) had a decisive role in the gathering of the population in this area, knowing that anthropic element prefer territories with low altitudes (terrace bridges – depressions), unexposed areas to flooding danger. Later, as a result of the population growth, the population was forced to occupy higher areas (the interfluve Ilva –Leșu, the interfluve Tiha- Bistrița etc.).

The population of the Bârgău Mountains experienced a rising drive from the early eighteenth century to the last decade of the last century. Thus, if in 1721, in the Bârgău Mountains area were present 4150 inhabitants in 1992, the population increased more than eight-fold, reaching a maximum of 35 258 inhabitants, after which the number began to decline steadily reaching 30373 people in 2011 due to a very low natural balance and a migration deficit (which, incidentally, remained the same throughout the period analyzed). In the communes Josenii Bârgăului, Lunca Ilvei and Tiha Bârgăului the decrease in population numbers had a decade of delay compared to the rest of the mountain unit, intensifying in the present, according to the 2011 census results. According to them, in the nine Bârgău

Mountains communes the number of inhabitants has decreased between the two official statistical measurements of the twenty-first century.

**Table 1 – The Bârgău Mountains. The numerical evolution of the population in villages (1850-2011)**

Nr. crt.	Comuna	1850	1900	1910	1930	1966	1977	1992	2002	2011
1.	Bistrița Bârgăului	1437	2735	2907	3029	4498	4502	4617	4396	3815
2.	Ilva Mare	1646	3236	3889	4192	2808	2744	2581	2569	2274
3.	Josenii Bârgăului	2676	3427	4038	4133	4062	4714	4922	5080	4541
4.	Leșu	621	1409	1679	1809	2976	3085	3130	2995	2510
5.	Lunca Ilvei	-	-	-	-	3417	3607	3335	3381	3086
6.	Măgura Ilvei	590	2049	2309	2598	3675	4088	4039	3815	1821
7.	Poiana Ilvei	-	-	-	-	-	-	-	-	1407
8.	Prundu Bârgăului	2062	3379	3595	4343	6043	5727	6389	6385	5633
9.	Tiha Bârgăului	1902	3335	3828	4308	5480	5993	6245	6288	5722
<b>TOTAL</b>		<b>10934</b>	<b>19570</b>	<b>22245</b>	<b>24412</b>	<b>32959</b>	<b>34460</b>	<b>35258</b>	<b>34909</b>	<b>30809</b>

Source: Bistrița Năsăud County Statistics, 2012 census and 2013 RPL

In line with the changes in the number and density of population is also the *overall density* which rose from 21.8 inhabitants/km<sup>2</sup> in 1850 to 58.3 inhabitants/km<sup>2</sup> in 2002, then it fell, such that, in 2011 it reached 54.2 inhabitants/km<sup>2</sup>. In terms of population distribution in the territory there are big differences among the communes, the highest values being present in the middle of the morphohydrographic axis Tiha-Bistrița, Prundu Bârgăului and Josenii Bârgăului having densities higher than average in the region. In the northern part, Poiana Ilvei is characterized by a high overall density (slightly over 100 inhabitants/km<sup>2</sup>), due to the small size of the settlement, while in what concerns the population total it only fits into the middle size category of settlements (with less than 1,500 inhabitants).

To highlight, in a more objective manner, the relationship between population and agricultural territory we also calculated the *pure density*, the *physiological density* and the *agricultural density*. If the overall pure density of the Bârgău Mountains remained the same over the analyzed period (1992-2010), of 1.2 inhabitants/ha of agricultural land, in its territory we can find either a significant increase in this indicator (as in Bistrița Bârgăului, Ilva Mare, Josenii Bârgăului, Măgura Ilvei and Prundu Bârgăului) or maintained at the same level (Poiana Ilva), or a decrease in the value of this indicator (Leșu and Lunca Ilvei) or alternating periods of decline with growth (Tiha Bârgăului), all this while the agricultural area decreased by more than 1,000 acres.

*Physiological density* showed an upward curve between the two reference points (1992 and 2010), rising at the overall level of the Bârgău Mountains from 5.4 inhabitants / ha of arable land to 6.2 inhabitants/ha, while the agricultural density decreased from 0.02 inhabitants/ha of arable land (1992) to 0.007 inhabitants/ha (2010). Low agricultural density is, on the one hand, a reflection of the orographic and pedological conditions, and on the other hand, a consequence of the reducing in the number of economically active population in the crop and animal husbandry sector and also in the absence of a legislative framework to stimulate this key area of the national and local economy.

In what concerns the natural population dynamics of the Bârgău Mountains area, it has experienced a downward trend between 1970 and 2005, the *natural balance* remaining, however, positive. Thus, if in the early period, the natural increase was 19.4 ‰, its value reached 1 ‰ in 2005. In four of the nine Bârgău Mountains communes, the natural balance was positive in all the time points, although decreased continuously, following the same downward curve specific to the entire mountain unit. These communes are: Lunca Ilvei, Ilva and Măgura (in the northern part of the Bârgău Mountains) and Prundu Bârgăului and Tiha Bârgăului located in the southern section, on the Tiha-Bistrița morphohydrographic axis.

The territorial population dynamics in the Bârgău Mountains area fluctuated significantly between 1980 and 2005, the Bârgău Mountains falling in the migratory deficient category. Here we were able to identify three distinct periods: from 1980 to 1985, when the migration deficit was reduced by almost half (from -13.1 ‰ to -6.7 ‰); 1985-1990, with a dramatic increase in emigration values, due to a reduced immigration, *migratory balance* peaking in the analyzed period reaching (-15.7%); 1990-2005 when the migration deficit was significantly reduced, reaching only -1.4 ‰ in 2005. At the administrative-territorial level, all eight existing communes in the Bârgău Mountains recorded in 1980, negative migration balance while 25 years later, Bistrița Bârgăului, Josenii Bârgăului and Lunca Ilvei held higher immigration rate than the emigration rate.

An important role in the geodemographic decline of the Bârgău rural areas also had the rural exodus, especially during forced industrialization, some of the adult population and therefore from the workforce, migrating to nearby urban areas (Bistrița, Năsăud, Sângeorz Băi).



masculinity ratio was 93.7 in the Bârgău Mountains (there were 100 women per 93.7 males), in 2002 its value increased to 101,2 men/100 women amid positive natural balance, increasing life expectancy among men and the specific economic activities in the Bârgău Mountains area (logging, mining).

The age structure of the population of the Bârgău Mountains, over a period of almost a century and a half (1857-2002), experienced substantial changes in all three of its components (youth, adults, elderly), the general trend being the demographic aging. In the absence of uniform data regarding age groups (for censuses of 1857 and 1930), comparative analyzes have as a starting point the year 1930 for the young people and the adult population, and the year 1857 for the elderly group (with the exception of the year 1930, where the adult group includes also the population between 60-64 years old).

The young population had a downward trend, reducing as a percentage, from 45% in 1930 to 21.7% in 2002, under the constant increase in the share of the adult population, which in 2002 came to represent 59.9% of the Bârgău Mountains inhabitants. Meanwhile, the share of the elderly population grew from 5.6% in 1857 to 18.4% in 2002. All these developments illustrate the aging population of the Bârgău Mountains area, measured with the help of the ratio between the elderly and the young population.

Thus, if in 1966, in no commune within the mountain unit, the ratio value between the elderly and the young did not exceed 0.40 (considered a threshold value by which is determined the aging or the rejuvenation of the population) and in the Bârgău Mountains this indicator was 0.26, in 1992, in all the communes so it exceeded the threshold value. In 2002 there was more than three times recorded growth in the value of the ratio between the elderly and the young people, reaching 0.84 on the overall mountain area higher values being registered for Bistrița Bârgăului (0.98), Măgura Ilvei (0.97), Ilva Mare (0.94) and Josenii Bârgăului (0.92).

Political-historical conditioning contributed to ethnic and religious landscape physiognomy, with a clear dominance of the Orthodox religion and of the Romanian population (at the present) over the nearly three centuries covered by this research, the ethnic landscape continually diversified due to penetration of alien ethnic elements (German, Hungarian, Hebrew, Romani), which brought with it changes in the denominational structure of the Bârgău Mountains. Political and economic events occurred between 1720-2011 prompted continuous adjustments from this point of view, up to the disappearance of ethno cultural communities (through emigration) in different time slots (the interwar or post-war period).



## **5. HABITAT – A REFLECTION OF NATURAL, SOCIO-ECONOMIC AND HISTORICAL CONDITIONS**

The identification of traces of habitation from the Neolithic period (ca. 5500-1900 BC), continuing then with the Bronze Age, Iron Age and the Dacian-Roman period backed by the archaeological testimonies discovered so far, is an undeniable argument of the existence of some forms of habitat in the perimeter of the Bârgău Mountains and thus of the continuity of habitation.

Between the third century and the tenth century, the Bârgău Mountains area faced the penetration of successive waves of migrating peoples, which, however, failed to weaken the ethnic and linguistic unity of the indigenous people, on the contrary, some migrant groups were assimilated (Slavs, Mongolian Tartars).

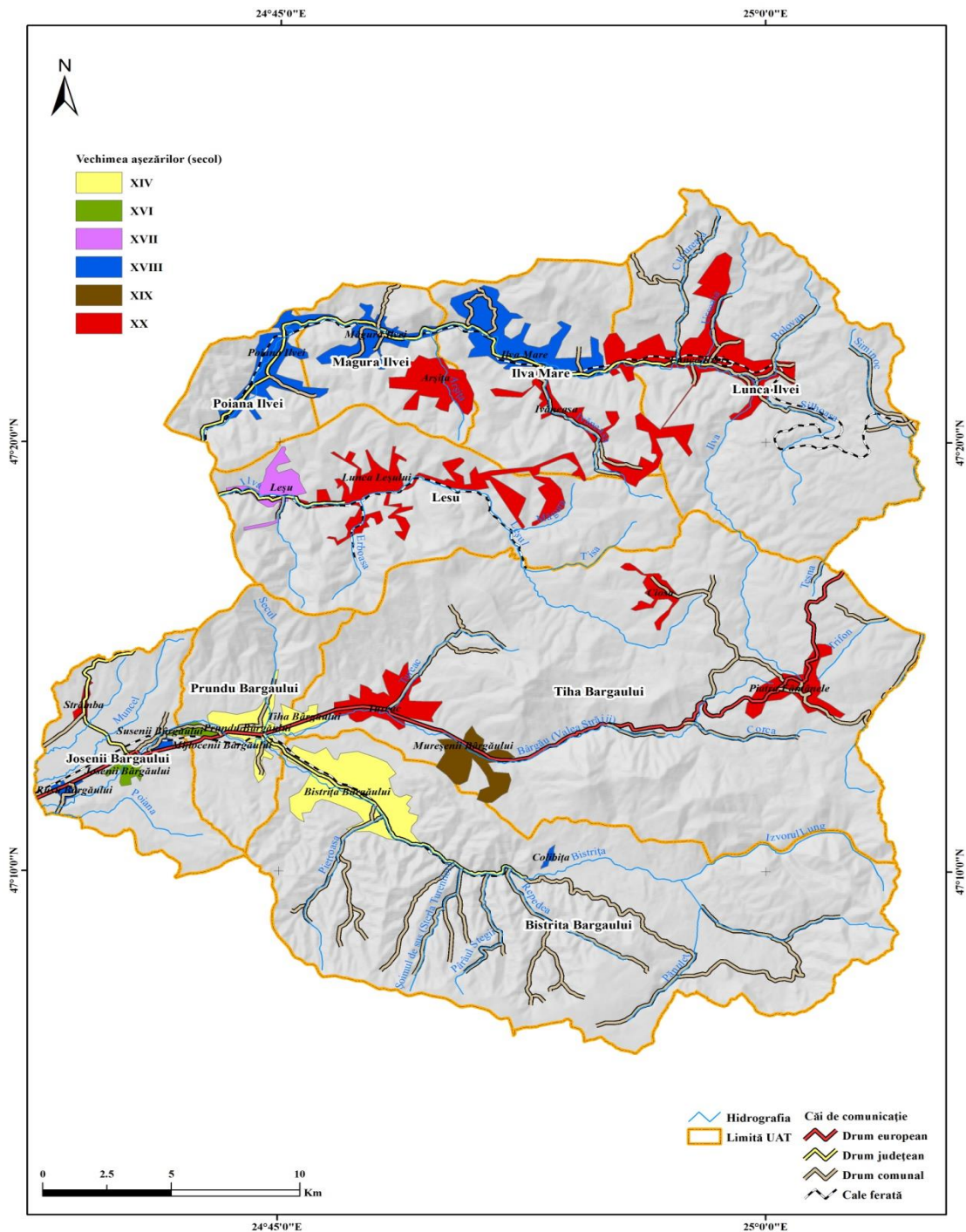
In the early Middle Ages (X-XIV centuries), the Hungarians entered in Transylvania, the Germanic population settled in the Bistrița and Rodna areas and the first records of the settlements from the Bârgău Mountains were made.

The Bârgău Mountains overlap the Bistrița-Năsăud county where 21 rural settlements are located, most of them (38.1%) obtaining the village status only in the second half of the twentieth century.

Depending on the peculiarities of the natural environment (in particular geomorphological and hydrographic aspects) two areas of habitation were contoured over time, having as vectors the four hydrographic arteries: Ilva and Leșu for the northern habitat area, respectively Tiha (Bârgău) and Bistrița in the southernmost inhabited area. Specific geographical conditions cause an uneven distribution of settlements. Thus, in the northern mountain areas, and in Ilva and Leșu valleys are present 8 of the 21 settlements of the Bârgău Mountains, which represents 38.1% of the total number of the localities of the region. On the other hand, in what regards their age, the first villages are mentioned in documents only in the eighteenth century as a result of the swarming of the population (by saltation over the Someș-Ilva watershed) part of the population of the oldest settlements in the Someșul Mare corridor (Rodna and Maieru).

On the other hand the morphohydrographic Tiha-Bistrița axis concentrates a space habitat known as the ‘United Villages of Bârgău’ “remarkable through the extension along the two rivers (Tiha and Bistrița), comprising 8 of the 11 settlements developed in the southern half of the mountain area, all having in their name the appellation “Bârgău” though most of them (Bistrița Bârgău Prundu Bârgău Susenii Bârgău Mijlocenii Bârgău Josenii Bârgău and

Rusu Bârgău) are located along the Bistrița (Transilvană), only two being truly “the Bârgău’s” (Tiha Bârgăului and Mureșenii Bârgăului).



**Fig. 3. The Bârgău Mountains. The age of settlements**

The density of settlements, it is far below the national average, due to the characteristics of the relief and the prevalence of medium, large and very large villages (76.2% in total). There are also considerable differences in the manifestation of the variables expressing settlements distribution (density index, dispersion index, area coefficient, the average distance between two locations and the polarization potential of the commune

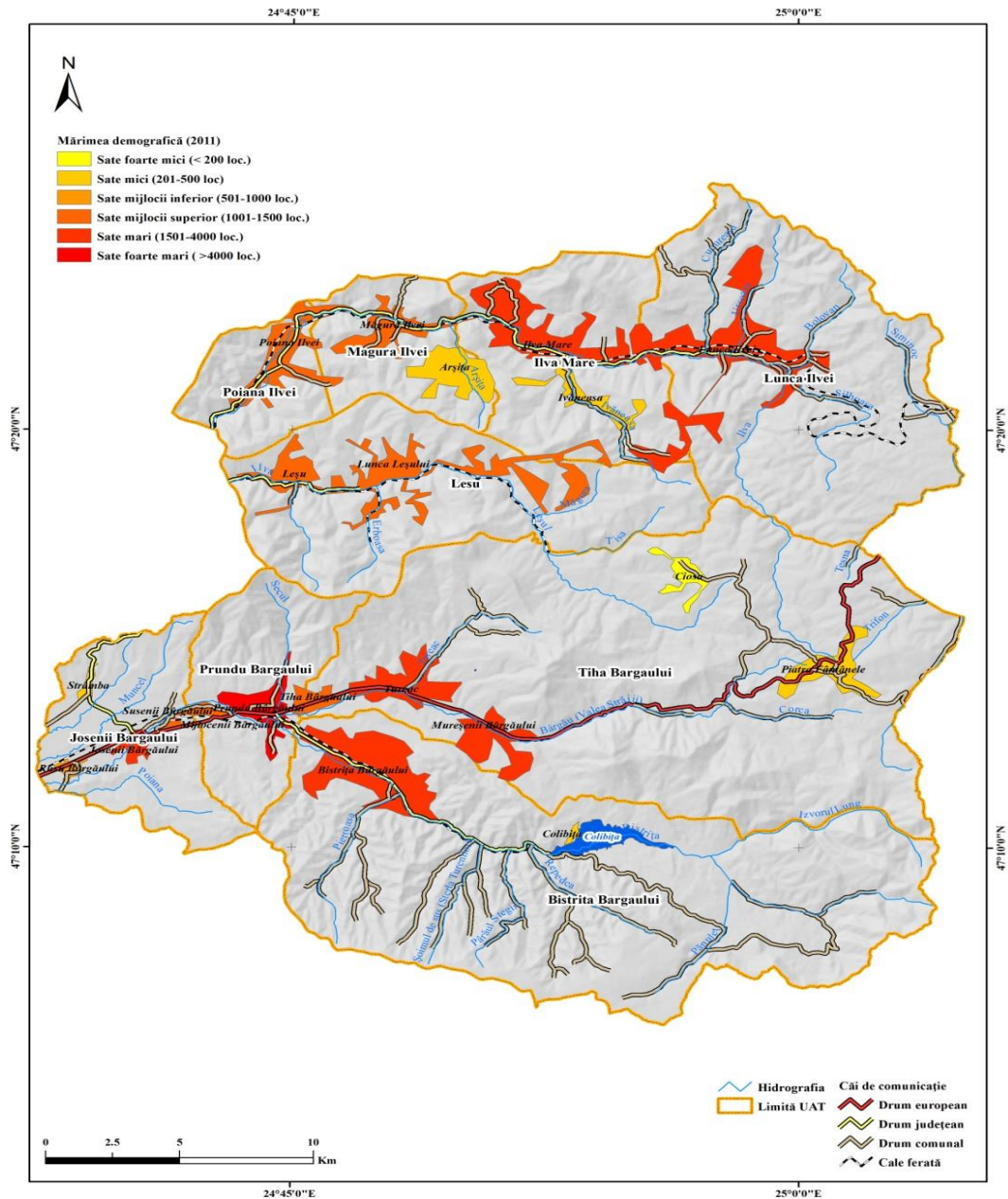
centres), both in the two areas of habitation (Ilva-Leșu and Tiha-Bistrița) but also at the commune level.

The morphological distribution reveals the presence of a large number of localities at altitudes between 600 and 1100 m (16), both in the Ilvei Depression basins (north) and in the Prundu Bârgău Depression (south) but also in the interfluves areas (Ilva-Leșu and Tiha-Bistrița), reflecting their adaptation to the orographic conditions, but also the need to expand the precinct of settlements amid geodemographic development.

The morphology of the precincts has undergone significant changes with the entry of the Bârgău Mountains in the perimeter of the Năsăudean Border District (in the second half of the eighteenth century until the mid-nineteenth century). Thus, from the settlements with precinct of irregular shape (areolar, with tentacles), it got to villages with a simple linear precinct and linear with tentacles precinct in most localities, due to the imperial orders of the time, which sought to gather the population from the slopes in precincts placed along rivers and transport routes for an easier training and education and for a quicker response to requests of military nature.

The settlements texture corresponds to a large extent to the precinct shape, having a predominantly linear texture (simple or bilinear), only in some cases, the texture being partially rectangular or even missing (settlements with no texture). The natural features, specific economic activities and government interventions during the military border period have influenced the settlement structure. Thus here prevail settlements with nucleated structure (12), some of them (5) with a dispersion tendency and one with an interpolation between a loose knit structure and dispersion tendencies. There are also present four loose-knit structured settlements, two with concentration nuclei, and five villages with a dispersed structure.

The Bârgău Mountains settlements have a high demographic potential, 12 out of the 21 localities falling in the category of large and very large villages. As the average size of a settlement, it is far above the national average. On the other hand, in the northern area there are present five large rural settlements, while in the southern area, six villages exceed 1.500 inhabitants and one (Prundu Bârgăului) has over 4000 inhabitants.



**Fig. 4. The Bârgău Mountains. The population size of settlements (2011)**

In general, there is no correlation between the size of the estate and the geodemographic potential of the settlements, except for two administrative units whose estates exceed 160 km<sup>2</sup> (the average for this mountain unit is almost 70 km<sup>2</sup>), and the total population is more than 4000. The *estate* satisfies undoubtedly the role of the economic support, thus that of sustaining the population. From the point of view of the estates, the three broad categories of land (agricultural, forestry and other land), there are significant differences from one community to another, depending on the particularities of the natural factors (geological, geomorphological and pedoclimatic). Thus, there are communes where

forest occupies over 50% of their estate (the southern Bârgău Mountains), while in others, pastures and hayfields have approximately 50% share of the estate structure.

Over the past century, the rural household has changed under the influence of economic and social dynamics, felt both on its size and in functional terms. However, the *ilveană* and *bârgăuană household* are characterized by strong local traits result of the practicality and aesthetic sense of the inhabitants of the mountain unit, although in recent years (with the liberalization of movement in Central and Western Europe) deviations have emerged from this that are closer to the kitsch type of construction. The average household size is very close to the national one and higher than that in the European Union, in 2011.

The number of conventional dwellings experienced a significant progress between 1992 and 2011, at the entire mountain area and in each administrative unit. It also increased the dwelling area / inhabitant, while the number of people decreased between the two periods of analysis (1992-2009). However, this indicator of welfare is half the EU average.

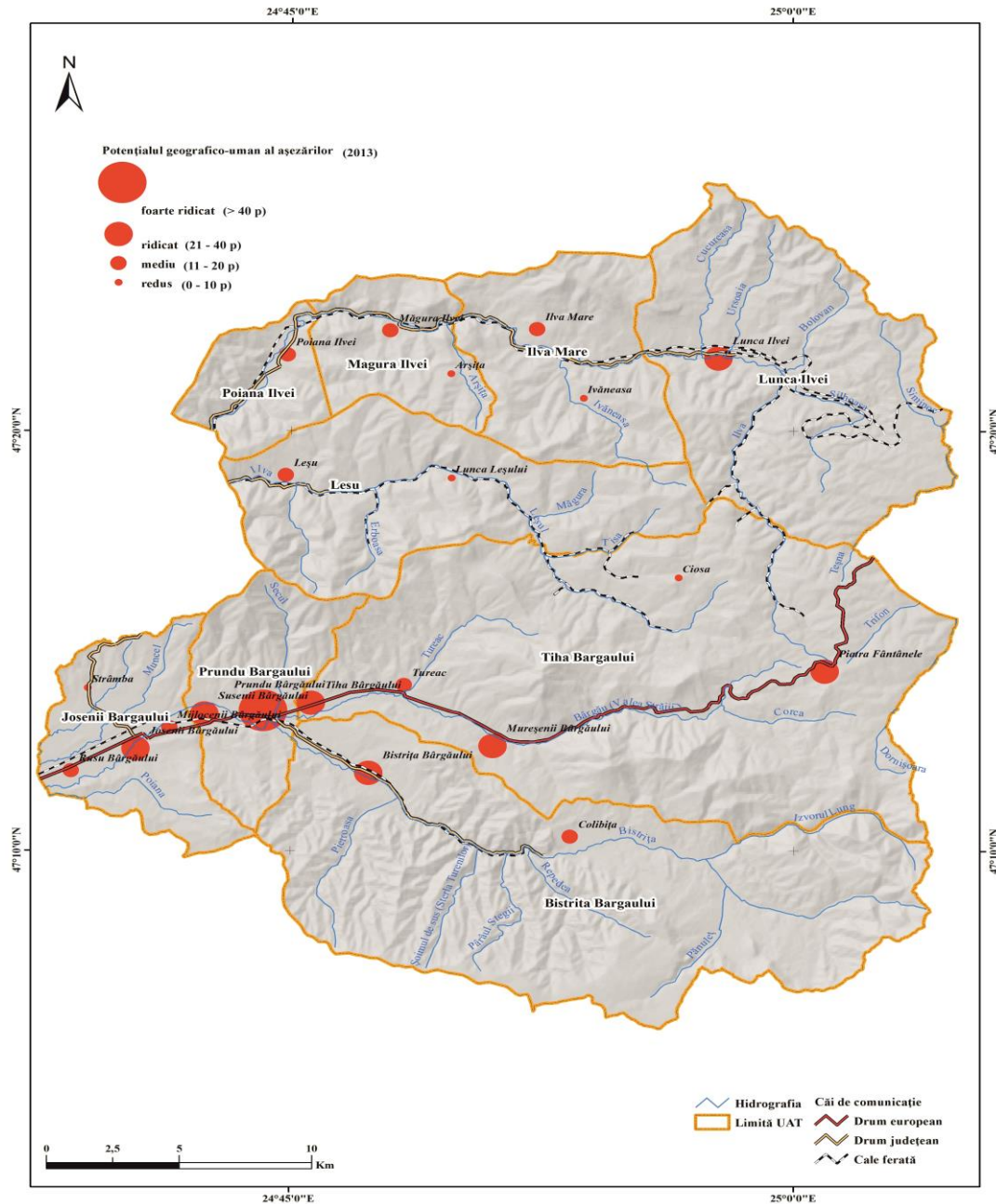
The functional typology of settlements in the Bârgău Mountains experienced a number of changes especially in the last decade of the last century. If the existence of large areas of forest resources and of deposits of rocks for construction has influenced the economic profile of some of the settlements in the mountain unit in other cases, the presence of quality pastures and hayfields led to the development of animal husbandry (sheep and cattle). There isn't, in many instances, a correspondence between the settlement's functions and the professional structure of its population, because a large part of the working population is not included in the statistics because they undertake agricultural and forestry activities in their own household or occasionally in other households. Thus, in addition to settlements with *agricultural functions* there are also settlements with *agricultural and industrial functions* (stone quarry exploitation, exploitation and primary processing of wood, machinery, electric power industry – only green energy, food industry). Traditional handicraft activities (sheep skin coat making, chimney making, pottery, small furniture making, especially sofas etc.) gradually loose ground amid the precarious financial situation of both producers and potential buyers.

A special category is formed by *settlements with mixed functions*, the activities within the tertiary sector (primarily the exploitation of tourism resources, but also the activities in the education and healthcare) occupy an important place alongside the primary and secondary sectors.

The determination of the place that each settlement in the Bârgău Mountains occupies in the territorial assembly was possible with the calculation of the *geographic and human potential* in each village, an extremely laborious approach, which involved using a set of



parameters (same for all settlements) and the detailed knowledge of the locations of each settlement in the mountain unit perimeter. By the means of the *estimation method (bonitării method)* we were able to quantify each category of potential and, ultimately, the hierarchy of settlements in this regard.



**Fig. 5. The Bârgău Mountains. The geographical and human potential of the settlements (2013)**

On the other hand, the network of settlements across the region is an open system that has material, energy and information exchanges with other settlements in the proximity or from larger distances. The absence of an urban centre in the Bârgău Mountains is felt both in the daily movement of the adult population and of school age children to the nearby urban centres and schools (Bistrița – for the Bârgău area settlements and Năsăud – for the

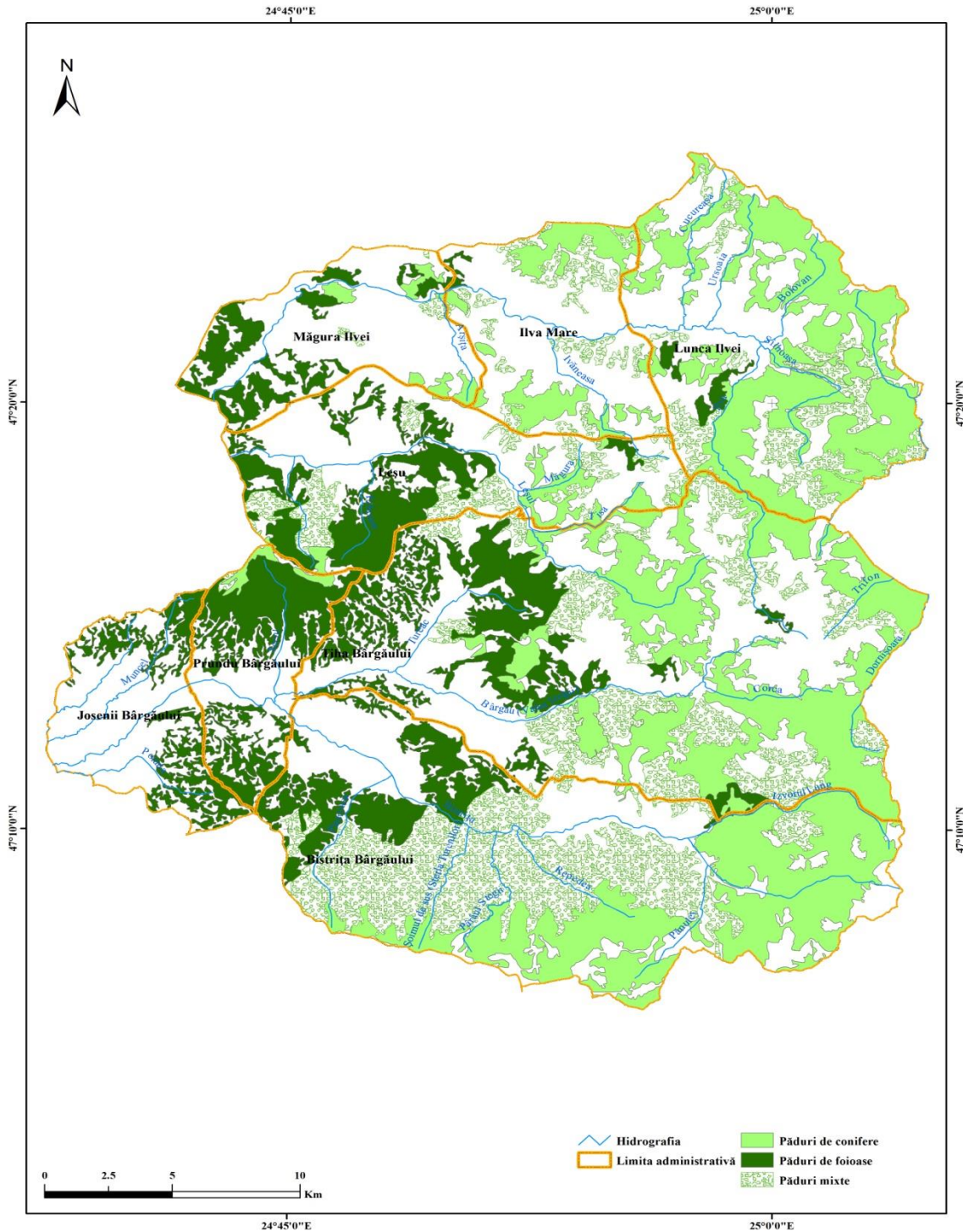
settlements in the Ilva area) and in the functional organization of the geographical space. The holarchy resulted comprises five levels, of which in the first two are included the aforementioned polarizing urban centres: Bistrița – at the first level of intra-and extra Bârgău area holarchy, that attracts the most consistent demographic and financial flows, being equally a main service provider ( education, healthcare, banking, administrative, etc..) for residents of South Bârgău Mountains (but not only), but also an important commercial centre; Năsăud – on the second level of the holarchy, the demographic flows resulting notably, from the school component in northern mountainous habitat and, to a lesser extent, the active employed population. It is, in turn, a service provider and an important commercial environment for the population in the northern area.

The third level in the hierarchy groups two settlements, one of which, Prundu Bârgăului, as a supra-centre for the population of all the settlements in the Tiha-Bistrița morphohydrographic axis due mainly to its tertiary valence that it holds, to which in the last four years, a new industrial vocation added, this time in the construction of cars, which resulted in raising of commuting from urban areas (Bistrița) to the rural area, and the second, Vatra Dornei, located outside the mountain space on the railway route that crosses the northern unit.

The last two levels of the settlements holarchy in the Bârgău Mountains groups the other commune centres (in the fourth) and simple rural settlements (in the V), with a corresponding reduction in the influence they exert on surrounding habitat areas.

## **6. THE GEOGRAPHIC AND ECONOMIC CHARACTERISTICS**

The Bârgău Mountains have as economic support underground resources (rocks for construction and mineral springs) and above ground resources (forests, meadows and hydropower potential). Although the economic importance of some of them is special, by not exploiting them to their true potential the regional economy does not enjoy the extra value that could be added through processing. It is, firstly, the forest stock that doesn't have a unit to be processed in finished products (furniture, mainly) in the entire mountain area. On the other hand, mineral springs present in both the northern half of the mountain space (with a different composition and properties), and in the southern area (salt springs) aren't capitalized, the areas in the southern compartment of the Bârgău Mountains could help (through their qualities similar to those of Ocna Sibiu and Sovata) develop resorts of local interest or even regional interest.



**Fig. 6. The Bârgău Mountains. The distribution of forests (2013)**

The hydropower potential has been identified and exploited since the ancient times (water mills, fulling mills, whirlpools, sawmills), leading in the second half of the twentieth century to a better use of waters of the river Bistrița Transilvană, with the construction of the Colibița reservoir and power plant.

Natural grasslands showed a continuous process of expansion (through extensive deforestation activities) due to the increasing of human pressure on space and livestock, that is



why today it represents the main means for sustaining the animal husbandry sector in the region.

Agriculture remains the main economic activity for the residents of the Bârgău Mountains, although this is not reflected (exactly) in the professional structure of the population. The relief and pedoclimatic conditions determined that the *animal husbandry* sector to be the main pillar of support of the agriculture, followed obviously by the crop sector (on small and disjoint surfaces), where the *potato* is main crop. On how the agricultural land is used, *pastures and hayfields* occupy the largest share in the mountain unit, followed by arable land, orchards and nurseries (in decreasing both as a percentage and as a surface in the beginning of the last decade of the twentieth century and the end of the first decade of our century).

Most of the land is privately owned, the public domain still having land (about 50.0% of the total) occupied predominantly by forest and secondary by grassland (25.0%). Moreover, during the communist regime, the farmland in the Bârgău Mountains didn't go through collectivization, while the forests have been subjected to restitution actions (since 1991), an unfinished process even today.

In terms of crops, there have been significant mutations related to their overall ratio between the end of the last century and the early part of the twenty-first century, in the sense that, as it was natural, given the natural peculiarities of mountain space, the percentage of grain crops (wheat, rye and corn) decreased first in favour of the potato cultivation and secondary to vegetables. Moreover, the main cereal yields per cultivated hectare (corn, wheat and rye) are extremely small, imposing either phasing these cultures or replacing them with others that are suitable for the local relief and pedoclimatic conditions or high efficiency farming (through seed selection, extensive mechanization and fertilization works).

In the context of an aging and impoverished population, it is unlikely that things will follow an upward trend, without a concrete and substantial support from the state authorities (through real subsidizing of the agriculture as it is practiced, otherwise in all EU). Things began to take a favourable turn with the establishment, in 2004, of the Agency for Payments and Intervention in Agriculture (APIA), but, nevertheless this did not result in significant changes in the way of farming, the productions obtained and the welfare of residents. The reasons underlying such a situation include: misstatement of cultivated areas, the lack of professionalism of the staff, the underperforming IT infrastructure (both the soft and the hard) etc.

The animal husbandry sector has a long tradition in the Bârgău Mountains area, sheep and cattle raising (mainly) being practiced since time immemorial. Although the numbers have declined between 1990 and 2003, the animal husbandry remains a core activity which should be supported and encouraged by government and local sustainable policies (animal selection, establishment of collection and processing centres in each commune centre, certifications that demonstrate the ecological value of traditional products, etc.).

With the decrease in sheep and cattle numbers, while maintaining relatively constant the sizes of the feeding areas for them between 1990 and 2003, there was a decrease in the feeding density in the Bârgău Mountains area as a whole, with some exceptions in territory (Măgura Ilvei and Bistrița Bârgău). In the same period decreased the number of pigs in the entire mountain complex, while only the poultry has increased slightly.

The Bârgău Mountains could be, in terms of agriculture, a sustainable development model, if there were applied concrete measures to support organic farming (livestock farms creation, the development of processing sector of their products – milk, meat, wool, the use of manure in soil fertilization, giving up crops that are not productive and introducing new crops – hemp oil, for example, etc..) to be in resonance with the current worldwide trend and to develop an area with high potential in the region – agrotourism.

Industry is represented by both the sectors of the extractive industry and manufacturing industry. In the northern part of the mountain area there are present almost all the mining facilities for rocks of construction, only one being located in the southern sector (at Colibița). The number of employees is reduced, their work being seasonal, and some of them operate in low profitability conditions.

On the other hand, manufacturing has a long tradition, dating from the second half of the eighteenth century, with the commissioning of the paper mill at Prundu Bârgău that operated with ongoing technological adjustments and continuous diversification of the manufactured products, for more than two centuries (until the first decade of the XXI century), with a peak activity during the planned economy period. On the old site of the paper mill, currently operates a cooling unit belonging to SC RAAL S. A. from Bistrița, which has, in fact, the largest number of employees of all the industrial units of the Bârgău Mountains (about 1000).



process of modernization (after 1998), with privatization, the products are designed, in great part, for export. A specific feature of this region is the large number of family associations and limited liability companies that have as main activity the primary processing of wood. Unfortunately, their number is decreasing with the installation of the economic crisis, resulting in a series of negative consequences on the socio-economic plan in the local communities.

An important industrial sector in the economy of the Bârgău Mountains is the green energy obtained first with the commissioning of hydro turbines from Bistrița Bârgăului, plus the latest investment in wind harnessing energy (Piatra Fântânele) and biomass (Lunca Ilvei).

Although the animal husbandry sector is well represented in the unit, over time, there were not erected large processing units of livestock products, during the communist era there was at Prundu Bârgău a branch of the milk processing plant complex in Bistrița and two small collection and processing of milk centres (from Ilva Mare and Piatra Fântânele). Now, this sector is poorly represented, only one milk processing unit operating in Lunca Ilvei.

The physical and social infrastructure of the Bârgău Mountains complete the human geography picture of the region, the level of development of which is a sine qua non condition of the welfare of the population in each settlement of the mountain unit.

The mountain unit is traversed by a European road, three county roads and a series of village roads, which are currently in a good and very good condition. There have been made significant investments over the last eight years, including in the roads linking remote villages in the central area of the Bârgău Mountains (Ivăneasa and Arșița) with the commune centres they belong to (Ilva Mare and Măgura Ilvei). There is a proposal in 2004, in the *North-West Regional Spatial Plan (PATR)* to build a highway between Cluj-Napoca and Vatra Dornei, part of its route will cross the southern part of the mountain unit. Until now (2014) there have not been made definite steps to achieve this goal.

The density of the road network, is above the national average. Passenger transportation is more developed in the southern half of the mountain space (having as a starting point Bistrița) than in the northern area (the town of Năsăud being, in this case, a centre of divergence for road transport). The county bus routes connect the residents of the Bârgău Mountains with the polarizing centres in proximity (Bistrița and Năsăud), while the long distance bus routes allow the movement of the population towards more remote urban centres (Rădăuți, Suceava, Botoșani, Cluj-Napoca, Oradea, Iași etc.).

Rail way transport is done on two railways: Ilva Mică-Vatra Dornei, which is electrified and is managed and maintained by the CFR SA and Bistrița-Bistrița Bârgăului

respectively, which is not electrified and was leased currently to a private transport company. Only half of the settlements of the Bârgău Mountains are connected to these railways.

The level of development of the utilities network is modest, the proposed or on-going projects (with European or government funds) being aimed precisely overcome this handicap. Of these, the power distribution network has a quasi-general distribution, in the lowest degree of coverage per commune (Tiha Bârgăului) ensuring, electricity to 95% of homes. With the respect to water supply, distribution networks are present in two thirds of the communes of the mountain unit. There are investment projects in this area for two out of the three communes that do not benefit of running water (Poiana Ilvei and Josenii Bârgăului). The sewerage system covers only a third of communes of the Bârgău Mountains, while, for wastewater treatment, there are currently two units (in southern mountain area, of which one also does water treatment) and an ongoing project (in Lunca Ilvei).

Access to land telephone services increased between 1990 and 2006, all communes having subscribers receiving facilities of telecommunications via land networks. The smallest number of subscriptions registered at the commune level exceeds 200, and the highest number approaches 900. Over time improved the call quality, by using modern technologies in the field, and the emergence of competing firms brought changes in the price of these services.

School age population of the Bârgău Mountains receive educational services, the 46 educational institutions covering all the levels of undergraduate instruction. However, there is only one unit that has a high school (Prundu Bârgăului) so, especially for students in the northern area, completing secondary education can only take place in settlements outside the region (Năsăud primarily, then Bistrița or Feldru).

Also, a part of the school population in southern area choose to continue their studies in secondary schools from Bistrița and Cluj-Napoca. Though the teacher/student ratio is below the EU average, we cannot talk of a high-quality education, if we take into considerations the results of the last years at the baccalaureate of the students of “Radu Petrescu” School in Prundu Bârgăului, the only high-school in the area. Graduation rate fell from 97.0% in 2005 to only 36.0% in 2012, and amid the change in the examination requirements (elimination of the oral exam by introducing language skills exams, and of subjects like Physical Education where most of the candidates got very good results).

The situation in this respect is extremely worrying, not so much in terms of the percentage of high school graduation, but rather the lack of perspectives for the graduates, which on the one hand, do not have the skills necessary for rapid insertion into the labour

market, and on the other hand, even if they have these abilities, most often can not be involved in the economic field due to the lack of jobs

The health network of the Bârgău Mountains has made significant progress in recent years, with the reopening (in 2011) of the Hotline Center of the Bârgău Valley (in the town of Josenii Bârgău) and the establishment in 2012 of the Prundu Bârgăului SMURD station. In this context, the population of all the communes receive primary health care services, although the number of patients per family doctor remains still high (over 2000) and the number of medical staff/ per doctor, the situation is far from ideal (3). On the other hand, it is necessary to promote disease prevention policies by adopting a healthy lifestyle (nutrition, sports, positive thinking, stress management, etc.).

Although they do not have the same elevation as that of the neighbouring mountain massifs (Rodna and Călimani) the Bârgău Mountains through their specific geological and geomorphological activities, followed much later by human activities, amount to a significant number of tourist resources whose exploitation to their true potential might generate huge leaps in terms of economic and social welfare of the population of mountain unit. However, the development and tourism promotion are inadequate, making a development strategy for this sector an urgency as this could propel the Bârgău Mountains on the map of the most attractive tourist destinations (in any season).

In order to obtain the comfort and wellbeing of the population of the Bârgău Mountains area it should benefit not only of the conditions created by the natural environment, but also some elements of infrastructure that will increase the quality of life of each individual and of each rural community. Therefore, in the strategies and projects drawn up by local authorities almost everywhere there can be found proposals for expansion or introduction of the water supply and sanitation, upgrading of road infrastructure, rehabilitation of schools and of the health and public administration building, local sports grounds, guesthouses, churches etc. Their achievement (and similar others) depends to a large extent on the ability of local authorities to manage funds raised by projects made, how to do the work and meet deadlines in projects. Time is running out as the period in which not only rural settlements The Bârgău Mountains, but other localities in Romania can benefit from non-refundable funds has a deadline.



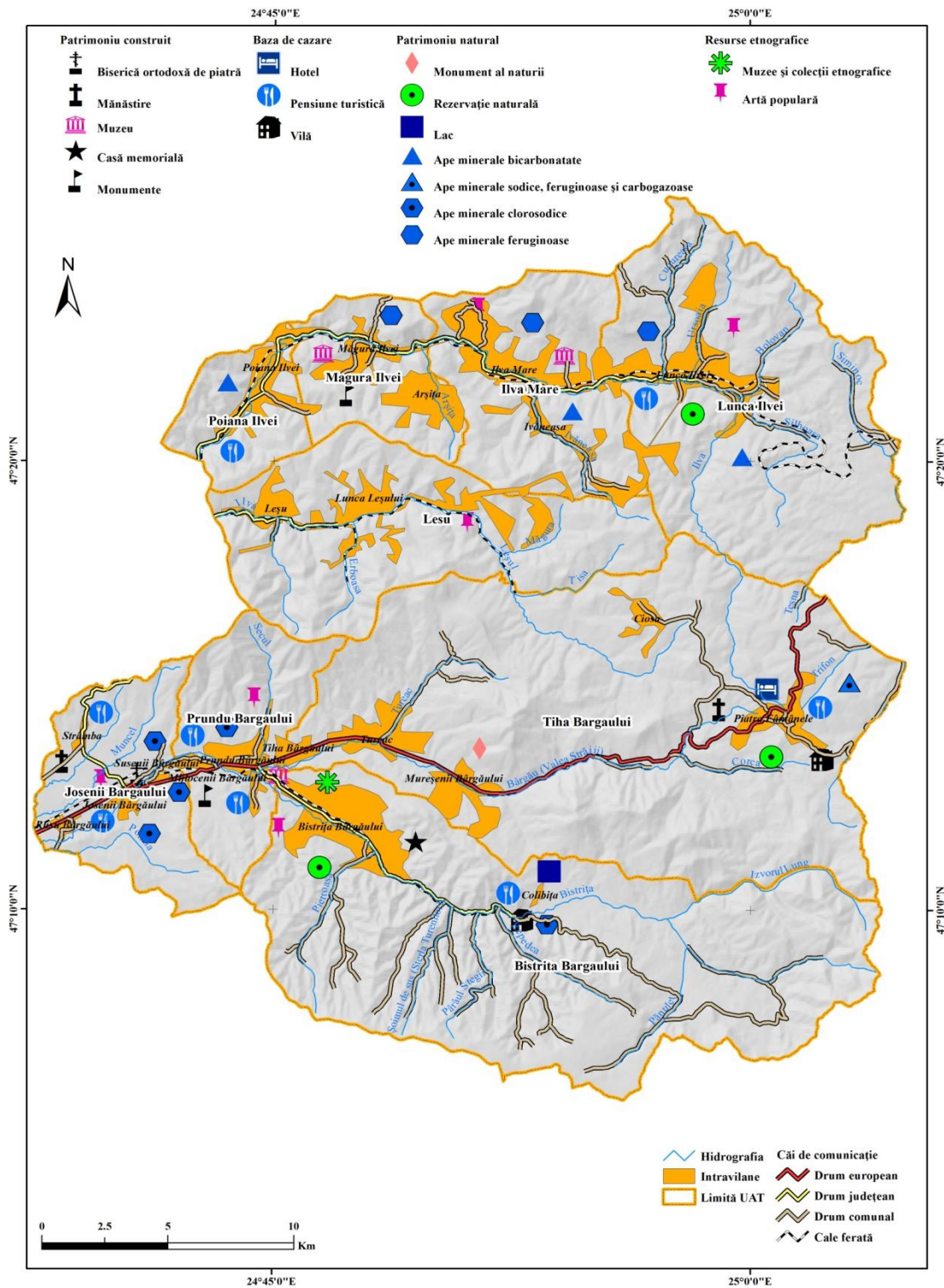


Fig. 8. The Bârgău Mountains. The tourist Map (2014)

## 7. THE HUMAN-GEOGRAPHICAL MODEL OF THE BÂRGĂU MOUNTAINS

The research undertaken on the Bârgău Mountains, with the accent on human-geographic components, but starting, as was only natural, from setting the limits of the

analyzed area (geographical and administrative) and location in territory and continuing with emphasising the state of the geographical research of the area and of natural premises that have influenced the design and development of the anthropic system of the mountain unit could not end without the designing of the human-geographic model of the studied territory, having as reference points the results of the SWOT analysis elements for creating the basis of a sustainable development strategy of the Bârgău Mountains.

The human-geographical model of the Bârgău Mountains seeks to maintain the strengths identified in the SWOT analysis, to materialize opportunities, to turning weaknesses into strengths, respectively threats into opportunities. Obviously, any model, regardless of its nature, “is a paradigm, a way of looking at a certain part of reality, so that it generate understanding and / or solving a problem of reality” (Canaău, S., 2012). Therefore, the SWOT analysis conducted on the Bârgău Mountains area highlighted besides the positive aspects within the area outside the village, but also outside it, the most important issues that were faced and are been faced by the residents of the region, which if solved, the geographical reality of the Bârgău Mountains would look completely different.

The weaknesses identified regard both the geodemographic component, and the habitat but also, obviously, the economic component. In terms of population, the aging population, the negative migration balance of the population, its exclusively rural character, the dissipation of the traditional values of the community are all negative aspects that define geodemographic reality of the Bârgău Mountains area. The solutions for recovery are not easy, and often depend to a large extent, not on the population itself but on the national, European and even worldwide socio-economic context.

Demographic aging is a process that can not be stopped, due to life expectancy increasing in most countries, with the eradication of incurable diseases that determined centuries ago, a very high rate of mortality and due to medical progress. On the other hand, the intensity of the process can be reduced by increasing the birth rate, while maintaining the adult population of childbearing age in the region. This, however, can not be achieved without the existence of a favourable economic environment that involves the creation of jobs for different professionals and achieving higher levels (comparable to the European Union) in wages. Thus there might be triggered a remigration process of a part of the population gone for a long period abroad, but based on internal conditioning, never abandoned the idea of returning. If they reach this point, it would benefit not only the geodemographic component of the localities (by changing population structures), but also the habitat and the economic component, provided there are financial resources available to build new housing units or



modernization of the existing ones and opening of business opportunities for people with entrepreneurial spirit.

Also, in some cases, members of the same ethnic group, being far from the territory of the motherland, in order to affirm their membership in a particular cultural space, turn to the “treasure” that every individual or community has accumulated over time until the movement of emigration. These are customs and traditions deeply rooted in the collective unconscious and could be revitalized with the return in the native land, thus contributing to the reaffirmation of traditional values of the community, developing at the same time, due to the widening of cultural horizon, the spirit of tolerance and promoting of unity in diversity.

Regarding the habitat component and the degree of its equipment with utility networks that are absolutely necessary for a decent living, there must be solved the problems with water supply and sewerage of all dwellings in the Bârgău Mountains area. There are projects in this regard. However, still remains to be solved, in some cases, the issue of the rhythm of execution of the works and meeting the deadlines for their completion. Until the time the drinking water supply and the sanitation will cover the entire habitat space of the Bârgău Mountains area modernization remains a utopia.

Agriculture, despite its huge potential is improperly capitalized primarily due to the high degree of fragmentation of agricultural land, plus the reduced percentage of arable land and the lack of modernization of agricultural practices that maintain in the area subsistence agriculture. The development of forms of association of small landowners, providing facilities in lending, substantially subsidizing agricultural practices and encouraging organic farming could be as many keys to open new perspectives on the agricultural landscape of the Bârgău Mountains. The welfare would increase slowly but surely, in the short and medium term, the benefits of implementing such policies in agriculture is would prove its value in the long term.

Another negative aspect of the economic component of the analyzed region is the small number of large operators. Moreover, with the exception of the cooling systems plant from Prundu Bârgăului (part of SC RAAL SA Bistrița, a prestigious company in automotive industry) and the woodworking plant at Lunca Ilvei (SC Silvania International Products Ltd) that have significant investments in advanced technologies, a varied production range, designed primarily for export, there are in the Bârgău Mountains just small businesses whose products do not contribute to balancing of trade in Bistrița Năsăud county, and Romania respectively.

Overcoming this shortcoming could be achieved, on the one hand, by investing in green energy and, on the other hand, through the development of an efficient system for

collection and processing of berries and edible mushrooms. Regarding the so-called “green energy” from renewable sources, there are concerns and even achievements (which were mentioned in the chapter assigned to manufacturing), these being, however, insufficient comparing to the great potential (hydroenergy, wind and vegetation) that the Bârgău Mountains area holds. Attracting investors should be a priority of local and county authorities and the beneficiaries of these investments should be, to a considerable degree, and the inhabitants of the settlements of the region.

On the other hand, a potential that is very little exploited is the berries and the edible mushrooms. The establishment of collection centres (cooperatives) and a processing plant for them would bring benefits to a wide category of people (those who collect the berries and mushrooms, the employees of those units), and the state (by reducing the number of unemployed and socially assisted persons, by the income that would reach local budgets by boosting exports and so on).

The absence of a regional development project puts decisively its mark on the lack of perspective in the sustainable development of the Bârgău Mountains area, even if at the administrative-territorial units there are development strategies and projects in various stages of implementation. Creating a unified plan, integrative, to which could bring their contribution the local authorities of all the communes in this mountain area could be a step forward of the Bârgău Mountains from the shadow that it finds itself today (in terms of economic aspect, especially tourism). From analysing the development projects and programs existing in each community, we concluded that the problems facing the region are largely the same, and their solution, in our view, would be greatly facilitated by a joint approach. Unfortunately, as long as in the local area, the policy of the local authorities is one placed in service of the parties they belong, and not in the service of the citizens and the collective interest is subordinated to personal and group interests, safeguarding human communities can not be achieved.

Among the risks that threaten not only the Bârgău Mountains area, but also other geographical areas of high domestic migration, the most significant appears to be the economic instability of receiving countries of migrants coming from our country. Turning this risk into an opportunity can be realized only if the affected population managed to gather enough financial capital to return to their native villages and help with the new assumed mentality and through investments in various fields, and contribute to the economic recovery of these settlements, and why not, to the entire region.

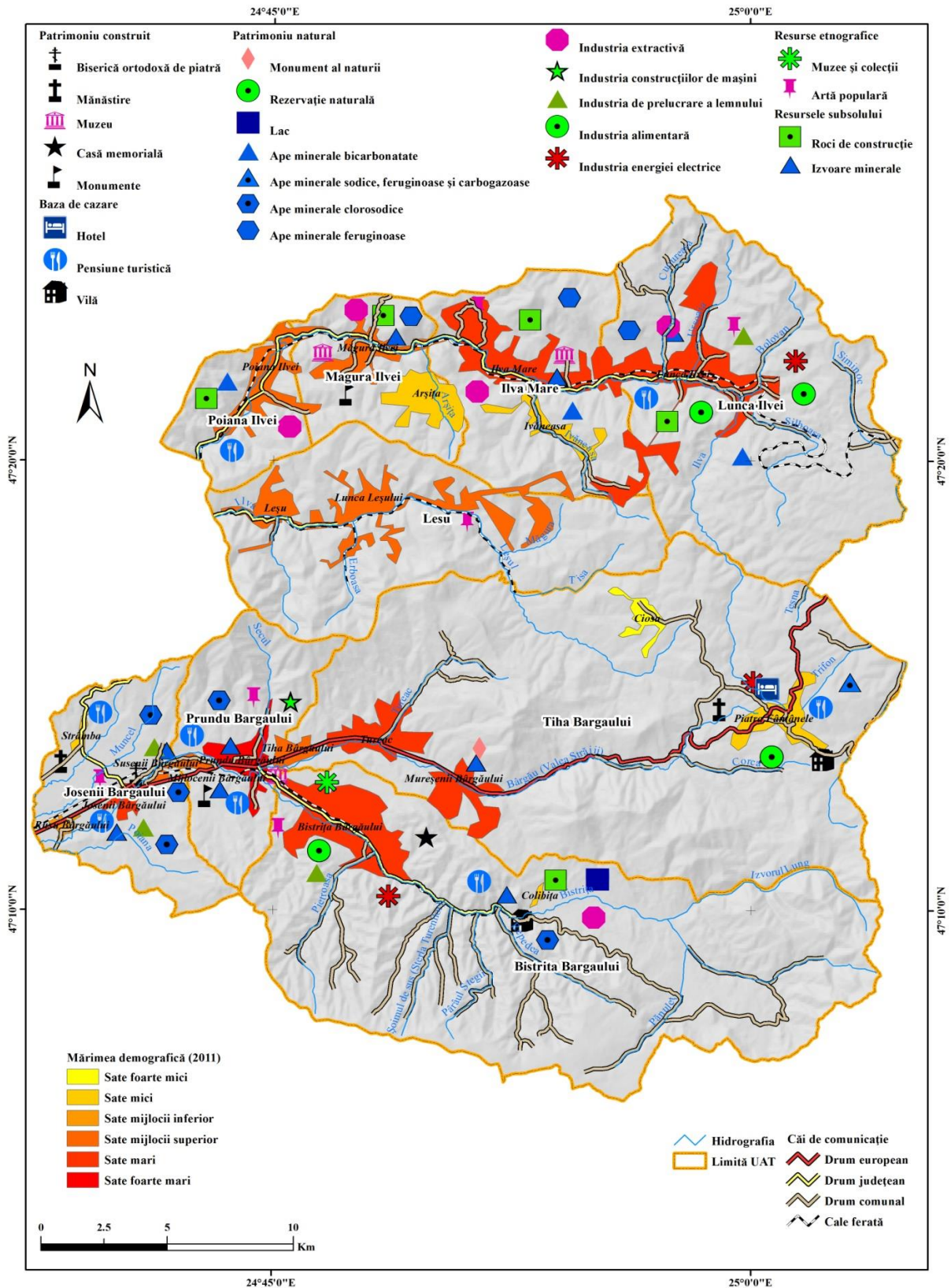


Fig. 9. The Bârgău Mountains. Human-geographic map (2014)