

THE SPATIAL DISTRIBUTION OF SETTLEMENTS IN THE BÂRGĂU MOUNTAINS

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ABSTRACT – Based on the specific geomorphologic and hydrologic background, the Bârgău Mountains have faced an extensive and prolonged human process, the main vectors being the two morpho - hydrographic axes (Ilva-Leșu and Bârgău-Bistrița), including the interfluvial areas, which were introduced, in different degrees, into the humanized territory. Thus, *two habitational zones* are distinguished, the one of Ilva and Leșu (in the central part) and the one of Bârgău and Bistrița, in the south. The present study aims at emphasizing the main aspects connected to the territorial distribution of habitats in the Bârgău Mountains, from a double perspective: *quantitative* and *morphological*. The analysis of the quantitative distribution of settlements was made starting from the calculation of some synthetic indicators (the settlement density, the area coefficient, the dispersion indicator, the average distance between two localities). As altitude plays an important role in the spatial distribution of habitats, four “generations” of settlements were identified depending on the elevation levels. The most numerous localities in the Bârgău Mountains (16 out of the total of 20) are situated between 601 and 1100 m, illustrating the specific morphometrical features of the territory. Besides the role that the terrain plays in the distribution of habitats, the swarming processes (through displacement and saltation) have to be mentioned, as they contributed to the confinement of the forest surfaces, so that, now, the Bârgău Mountains represent a strongly humanized area.

Keywords: quantitative distribution, morphological distribution, settlement density, area coefficient, dispersion indicator, average distance

INTRODUCTION

The Bârgău Mountains, through the presence of *Ilva* and *Leșu*, which cross through the middle of the mountain unit, as well as *Bârgău* and *Bistrița*, at the southern margin of the mountain space, have faced an extensive anthropogenic process, whose beginning loses itself in the mists of time. It is the space in which, based on the archaeological research performed in the area, the presence of man dates back to at least the Neolithic (around 5500 – 1900 BC). Each historical era has left traces of the presence of man in this mountain area, the specific features of the landscape leaving their mark both on the establishment of the first settlements (temporary), and also on the subsequent developments of the settlement system of the Bârgău Mountains (Figure 1).

The spatial distribution of settlements is a very important component in the analysis of the habitat of a certain geographic space and it could be approached from two points of view: *quantitative* and *morphologic*.

THE QUANTITATIVE DISTRIBUTION

It is highlighted with the help of some indicators: *the settlement density*, *the area coefficient*, *the dispersion indicator*, and *the average distance between two localities*. The data on the basis of which these indicators were calculated are those from the 2002 census.

a) *The settlement density* represents a key synthetic indicator in the analysis of the territorial distribution of settlements. The Bârgău Mountains cover an area of 1,307 km², on which 21 rural

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settlements are present. Thus, it results an average density of 1.6 localities/100 km². Consequently, the space of the Bârgău Mountains belongs to the category of regions with low density of settlements, the value being much under the national average of 5.6 localities/100 km². The low density of settlements is a consequence of the high share of large and very large villages (57.1%), to which medium-sized villages are added (19.05% of the total number of rural settlements in the Bârgău Mountains). The morpho – hydrographic axes represented vectors of territorial colonization, favouring the framing of some large and very large rural habitation entities.

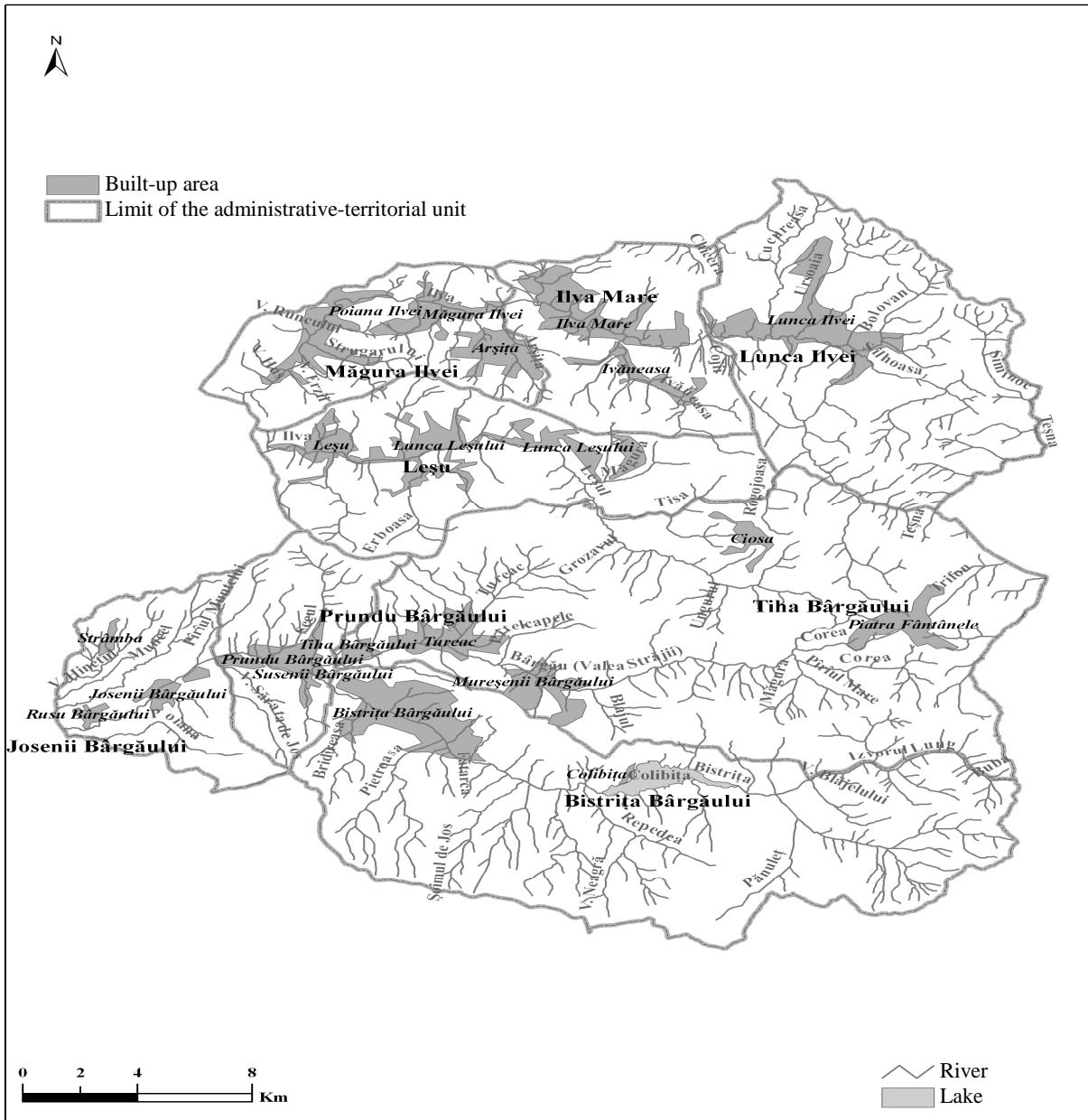


Figure 1. Bârgău Mountains. The settlement network (2011)

At the level of the territory, there are obvious contrasts in what concerns the density of settlements, from 1.1 localities/100 km², in the case of Bistrița Bârgăului and Lunca Ilvei communes, to 7.2 localities/100 km², in the case of Josenii Bârgăului commune. Bistrița Bârgăului commune covers a larger area (186.27 km²), which represents 14.3% of the entire Bârgău Mountains area, in the conditions

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in which it has only two villages. In the case of Lunca Ilvei commune, the low density of settlements is owed to the fact that this administrative territorial unit comprises only one village (Table 1).

Table 1. *The quantitative distribution of settlements in the Bârgău Mountains*

Commune	Area (km ²)	Number of settlements	Settlement density	Area coefficient	Average distance	Dispersion indicator
Bistrița Bârgăului	186.3	2	1.1	93.1	93.1	0.19
Ilva Mare	83.4	2	2.4	41.7	41.7	0.47
Josenii Bârgăului	55.6	4	7.2	13.9	13.9	2.42
Leșu	90.2	2	2.2	45.1	45.1	0.81
Lunca Ilvei	91.3	1	1.1	91.3	91.3	-
Măgura Ilvei	47.6	3	6.3	15.9	15.9	1.64
Prundu Bârgăului	47.5	2	4.2	23.8	23.8	0.44
Tiha Bârgăului	199.0	5	2.5	39.8	39.8	3.76

The density of settlements exceeds the average of the region in all the other communes in the Bârgău Mountains. Two groups are noticed in relation to the density of settlements at national level: communes having a density below the national average (Ilva Mare, Leșu, Prundu Bârgăului and Tiha Bârgăului) and communes having densities over the national average (Josenii Bârgăului and Măgura Ilvei). In the case of Josenii Bârgăului commune, the high density of settlements is a consequence of the great number of villages (4) that occupy a small area (55.58 km²). One can thus notice a heterogeneous distribution of this indicator in what concerns the territorial profile, at the level of the

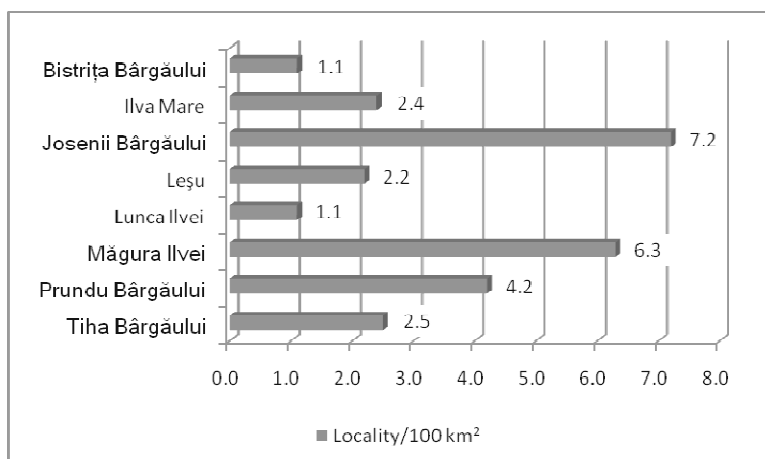


Figure 2. *Bârgău Mountains. The settlement density (2002)*

Ilvei registers the highest density of settlements (6.3), followed by a decrease to 2.4 localities/100 km² in the case of Ilva Mare commune and to 2.2 localities/100 km², in the case of Leșu commune.

Tiha - Bistrița morpho - hydrographic axis emphasizing the increase in the density of settlements from upstream to downstream: Bistrița Bârgăului (1.1), Tiha Bârgăului (2.5), Prundu Bârgăului (4.2) and Josenii Bârgăului (7.2) (Figure 2).

The Ilva - Leșu morpho - hydrographic axis stands out through the very low density of settlements in the eastern end (which is similar to the communes in the south), Lunca Ilvei having the same density as Bistrița Bârgăului, namely 1.1 localities/100 km². Downstream, Măgura

b) *The area coefficient* represents the relation between the area and the number of settlements, namely the area covered by one settlement. At the level of the Bârgău Mountains, the value of the area coefficient is of 62.2 km²/locality, value which is much above the national average (18.1 km²/locality). The high level of the area coefficient reflects the reality of the territory, as the Bârgău Mountains occupy an area of 1,307 km² and include 21 localities, mostly large rural settlements, both in terms of area and the demographic aspect.

At the level of communes, the area coefficient varies between 13.9 km²/locality and 93.1 km²/locality. It is interesting that this indicator is in a relation of inverse proportionality in comparison with the settlement density.

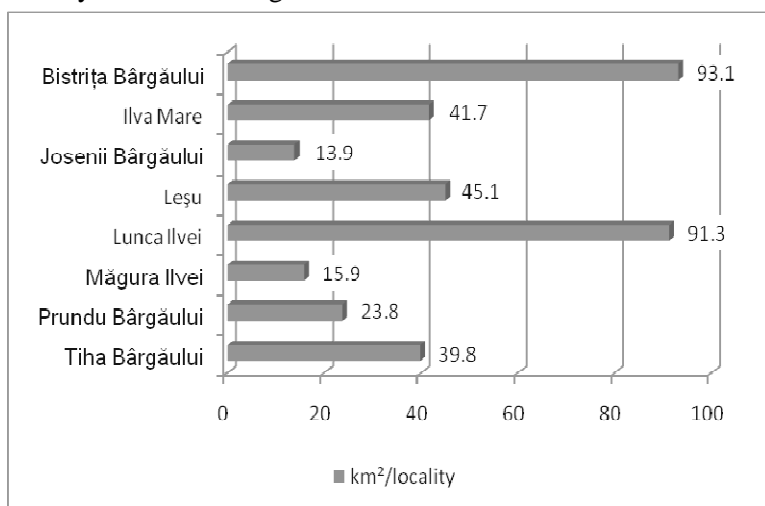


Figure 3. Bârgău Mountains. The area coefficient (2002)

Consequently, the communes with high density of settlements register low values of the area coefficient (Josenii Bârgăului and Măgura Ilvei), while the communes with low settlement density are characterized by high values of this indicator (Bistrița Bârgăului and Lunca Ilvei). In the case of Lunca Ilvei commune, the area coefficient coincides with the area of the commune as it comprises a single village. The other communes in the Bârgău Mountains have values of the area coefficient under 50 (Figure 3).

Thus, Prundu Bârgăului commune, having only two villages, has an area coefficient of 23.8 km²/locality, in the conditions in which its area does not exceed 50 km². On the other hand, Tiha Bârgăului commune, although it belongs to the category of large administrative-territorial units (199 km²), the average area occupied by a settlement does not exceed 40 km², being formed of 5 villages.

c) *The average distance between two localities* is obtained on the basis of the area coefficient (a), according to the formula: $m.d. = 1.2\sqrt{a}$. The average distance between two localities in the Bârgău Mountains is 9.5 km, which is above the national average of 5.1 km.

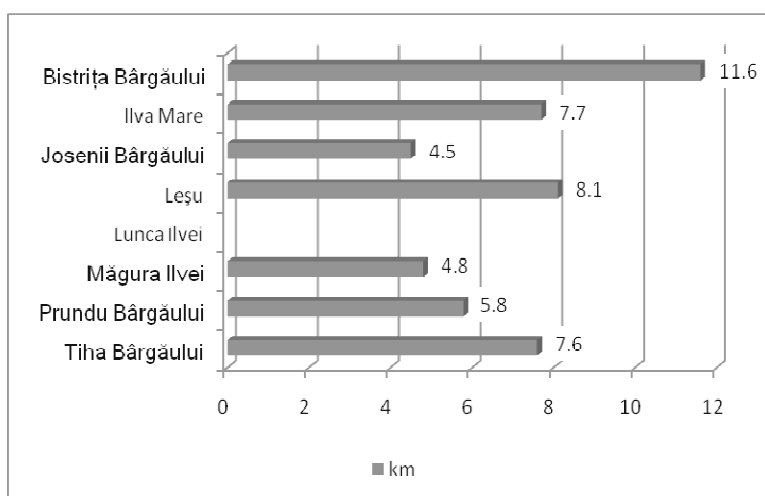


Figure 4. Bârgău Mountains. The average distance between two localities (2002)

It must be mentioned that in the case of Lunca Ilvei commune, the average distance between two localities has not been calculated because it has only one village. This indicator is in direct proportionality with the area coefficient, on the basis of which it is calculated. The average distance between two localities varies between 4.5 km (Josenii Bârgăului) and 11.6 km (Bistrița Bârgăului). Măgura Ilvei commune stands out through an average distance below the national one, being, however, less than 10 km (Figure 4).

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d) *The dispersion indicator* also highlights the territorial relations between settlements. In order to obtain it, we have used A. Demangeon's formula: $Id = (N-N')xn/N$, where N – the total number of inhabitants; N' – the number of inhabitants from the village of residence; n – the number of villages which are not residence. Similarly to the case of the average distance between two localities, the dispersion indicator could not be calculated for Lunca Ilvei commune, N being equal to N'.

The value of the dispersion indicator of the communes in the Bârgău Mountains ranges between 0.19 and 3.76. Thus, starting with the reality of the territory, one could make the following typology:

- communes with a very low dispersion indicator (0.1-1) are those which are formed of two villages (Bistrița Bârgăului, Ilva Mare, Leșu and Prundu Bârgăului) and are included in the category of large villages from the population size viewpoint, with the exception of Prundu Bârgăului that belongs to the category of very large rural settlements;

- communes with a low dispersion indicator (1.1-2), such as Ilva Mare, composed of three villages, with the commune centre included in the group of large-sized villages;

- communes with a medium dispersion indicator (2.1-4) have the highest number of villages in the region (Josenii Bârgăului – 4 villages, Tiha Bârgăului – 5 villages) and large commune centres (more than 1500 inhabitants) (Figure 5).

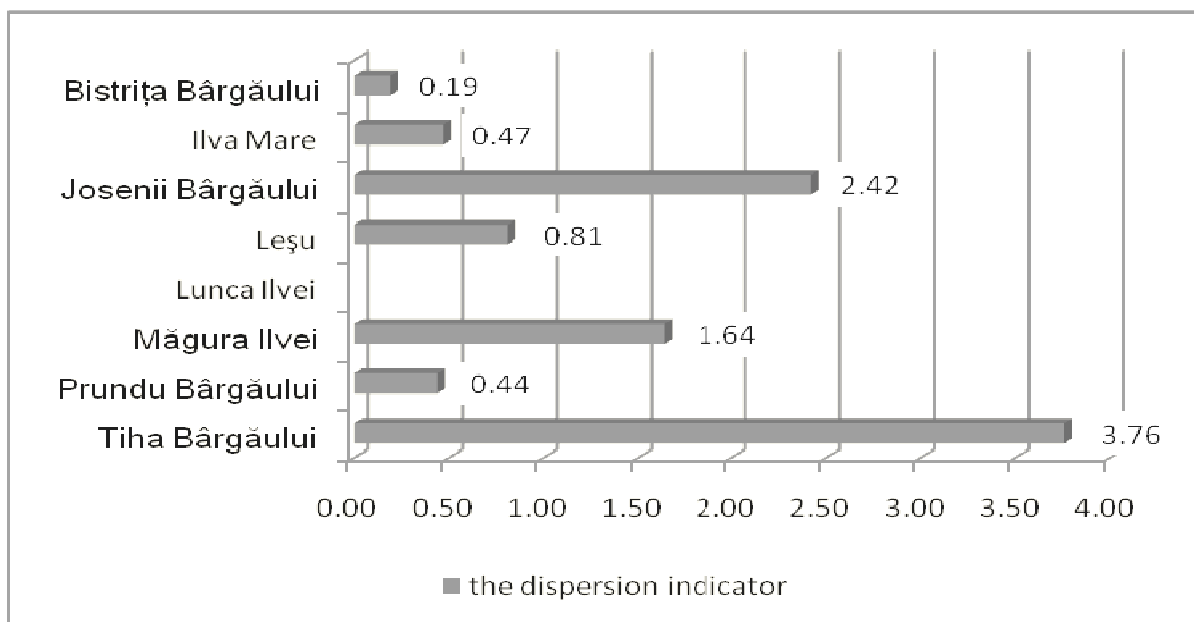


Figure 5. Bârgău Mountains. *The dispersion indicator (2002)*

THE MORPHOLOGICAL DISTRIBUTION

It refers to the distribution of settlements on elevation levels and to the location of villages in relation to the morphological units. The morphological distribution is conditioned by a series of factors of tectonic and lithologic nature, the depth of fragmentation (the energy of the terrain), the density of fragmentation and the organization of the river network. The coordination of the last one (Ilva, Leșu, Tiha and Bistrița), through the deepening in the complex of sedimentary rocks, has determined the creation of a low altitude terrain, with broad bridges and depressions (Lunca Ilvei, Ilva Mare, Măgura Ilvei, Poiana Ilvei – on the Ilva, Leșu – on the Leșu), including the depression valley between Mureșenii Bârgăului and Rusu Bârgăului, which opens progressively from upstream to downstream (firstly along the Tiha brook and along Bistrița). Before the confluence with the Tiha, at the foot of the Călimani Mountains, the small depression basin that shelters Bistrița Bârgăului village was sculpted on the river Bistrița.

In the Bârgău Mountains, the depth of the terrain fragmentation exceeds 1000 m, if we consider the fact that the Bistrița Valley is situated at the absolute altitude of 430 m in the perimeter of Rusu Bârgăului village and that the highest peak reaches 1611 m (Heniu Peak). In what concerns the distribution of settlements on elevation levels, the space narrows, from 430 m, at the exit of the Bistrița river from the mountain space, at over 1100 m, in the eastern end, within Colibița village. For that reason, Colibița Depression is situated at an altitude ranging between 900 and 950 m and, as a result of dispersion, the farms are located on the mountain sides at altitudes that exceed 1100 m.

In case of a homogenous distribution of settlements in the Bârgău Mountains, a number of 5.3

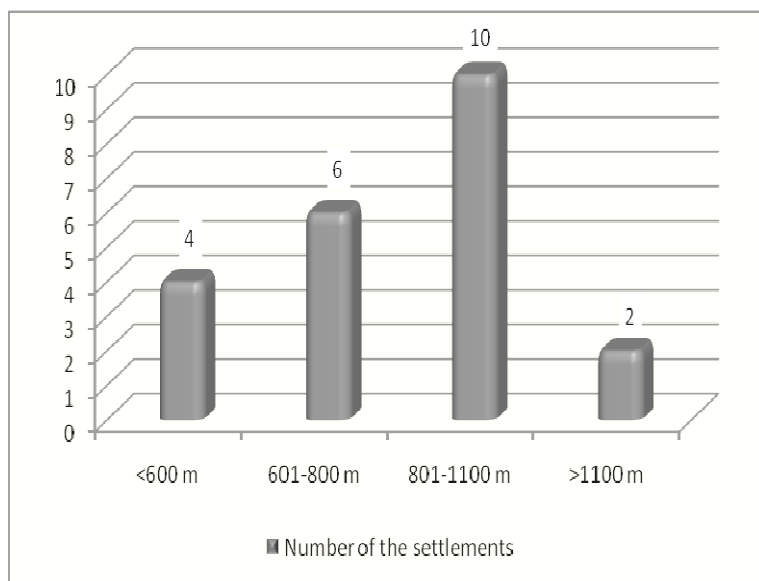


Figure 6. Bârgău Mountains. The distribution of settlements by elevation levels

settlements would be given to each altitude level. However, the morphological distribution is uneven, a small number of settlements situated at more than 1100 m height are noted (Piatra Fântânele and, partially, Colibița), while the majority of the localities (16) are grouped at two altitude levels: 601-800 m and 801-1100 m, respectively (Figure 6). The lower level, below 600 m, includes the villages that belong to Josenii Bârgăului commune, situated in the western part of the Bistrița Valley (Mijlocenii Bârgăului, Josenii Bârgăului and Rusu Bârgăului) or in the area of Strâmba Ghat (the name sake village), through which the connection with Ilva Mică Depression is made. The settlements situated at altitudes

ranging between 601 m and 800 m have developed in depression areas, where there is a slight tendency of dispersion on the mountainsides. They can be grouped, depending on their position within the region, in two alignments:

- *the southern alignment*, consisting of Bistrița Bârgăului, Prundu Bârgăului and Susenii Bârgăului, developed in Prundu Bârgăului Depression, representing 50% of the settlements situated at this elevation level;

- *the northern alignment*, including the localities of Măgura Ilvei, Poiana Ilvei and Leșu. In the case of Măgura Ilvei village, most part of the households was built on the 3-5 m terrace of the Ilva River. A fragment of the 10 m terrace located on the left bank of the river was preserved upstream the village church.

The greatest number of settlements in the Bârgău Mountains (10) has developed between 801 m – 1000 m, representing almost half of the total of settlements (45.6%).

This fact reflects the reality of the territory and the ability of the habitats to adapt to the conditions of the orographic factors. Two settlement groups can be highlighted at this level, too:

- *the settlements between the Someșul Mare Valley and the Leșul Valley*, presenting an obvious tendency to dissipate on both banks of the Ilva. Lunca Ilvei village, axially developed along the Ilva River, mostly on the lower terrace of 3-5 m, has extended both to the north, reaching the border of Șanț commune and also to the south, on the right bank of the upper stream of the Ilva until the border with Tiha Bârgăului commune. Arșița and Ivaneasa are situated on the interflaves of the Ilva and the Leșu, while Ciosa village is “nested” at the foot of Ciosa Hill (1187.2 m), between the upper stream of the Ilva and the upper stream of the Leșu.

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- *the settlements between the Leșul Valley and the Bistrița Valley* belong to Tiha Bârgăului commune and are characterized by an accentuated dissipation of farms, until they merge with those that belong to Colibița village, on the interfluvies between the Bistrița and the Tiha, in the case of Mureșenii Bârgăului village, or through the linear extension along the Tureacul brook (tributary to Bârgău). In this case, too, there are dissipated farms, to the north of the settlement towards Bârgău Hill (1362 m) and Erboasa Peak (1294 m).

CONCLUSIONS

The formation and evolution of the settlement network in the Bârgău Mountains were mainly conditioned by the orographic factor and by the existence of the hydrographic arteries. Due to the particular features of the natural environment, this mountain unit has represented, since ancient times, a favourable framework for the population to become sedentary. The forest, but also the other elements of the natural environment (climate, underground resources, morphological peculiarities, etc.) contributed in time to the extension of the habitation nuclei and to the occurrence of new ones.

The specific geographical-physical conditions determine an uneven distribution of settlements. Their density, at the level of the Bârgău Mountains, is below the national average as a consequence of the dominant presence of large and very large villages, which represent more than half of the total of settlements of the mountain unit. Significant differences have been noticed as regards the manifestation of the indicators expressing the distribution of settlements, both at the commune level and at subregion level. Thus, the density of localities is lower in the eastern part of the two morpho-hydrographic axes (Ilva-Leșu and Bârgău-Bistrița) and higher in the central and western sectors.

The main vectors for the development of the settlement system were, without a doubt, the depression areas within the morpho-hydrographic axes (Ilva with Leșu and Bistrița with Bârgău, respectively). The most representative habitats of the Bârgău Mountains are present at their level, although, in the case of some of them there is a tendency to dissipate on the mountainsides. On the other hand, the role that the processes of swarming (through displacement and saltation) from the mountain space to its contiguous territory (the Someșul Mare Valley) should not be neglected. Thus, Ilva Mare is a result of the swarming through saltation of some farms from the old settlements located in the Someșul Mare Valley (Rodna and Maieru). The same situation is found in the case of the settlements located the present perimeter of the commune Măgura Ilvei, but also of the localities Leșu and Poiana Ilvei. Consequently, the symbiosis between the natural environment (through its hallmark at the level of the mountain unit) and the processes induced by the human component has contributed to the genesis and the framing of the settlement system in the Bârgău Mountains, influencing both the number of settlements and the relation between them (*the quantitative distribution*) and also their altitudinal distribution (*the morphological distribution*).

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