Forum geografic. Studii şi cercetări de geografie şi protecţia mediului
*Volume **XII**, Issue **1** (**June** 2013), pp. **43-51***
*http://dx.doi.org/**10.5775/fg.2067-4635.2013.034.i***

Landscape Quality Assessment in Almăj Land Rural System from the Mountainous Banat (Romania), during the 1990-2010 period

Ana IANAS[1*]

[1] West University of Timişoara, Department of Geography, Romania
* *Corresponding author*, ianasana@cbg@uvt.ro

Received on <20-10-2012>, reviewed on <03-12-2012>, accepted on <14-03-2013>

Abstract

Almăj Land represents one of the "land" types of territorial entities from Romania and the only one of this type from the Mountainous Banat. It is a purely rural regional system where *the hierarchy* and *the centrality* are the two defining attributes for the 31 villages that represent the region's habitat component. The geographic location of Almăj Land constitutes the main element of restrictiveness regarding the region's development and the setting of the interrelations with the neighboring regional systems, aspect that has recorded the region in the category of the mountainous rural landscape. For this reason, the economic practices are not very diversified, being based only on the revaluation of the local resources (especially forests and agricultural resources).
This has accelerated the anthropogenic impact on its landscape and components, causing transformations in the typology of the rural landscapes. The changes occurred were identified following the calculation of several indicators of landscape quality assessment for a period of 20 years, choosing 2010 as the reference year.. The results obtained (*the naturality **ind**ex* - 0.56*, population density* 15.1 inhabitant/km², *the human pressure through agricultural* – 2.84 ha/inhabitant*, non-agricultural lands* – 4.54 ha/inhabitant and *forests* – 4.35 ha/inhabitant*, the environmental transformation indicator* 1.5) present the current state of the environment, practically emphasizing the more and more obvious anthropization of the mountainous rural landscape after the change of the political regime and the transition to the market economy, especially through massive deforestation.
The evaluation of the current condition of the landscape quality and of the changes in the landscape of the study area, should have a very important role for the mountainous rural community, in order to identify several protection measures of the ecosystems for the assurance of the sustainable development process, especially of the forest ecosystems, which are the most affected and the most important for maintaining ecological balance.

Keywords: *regional system, human pressure, rural landscape, land use, Almăj Land, Mountainous Banat*

Rezumat. Evaluarea calităţii peisajului în sistemul rural Ţara Almăjului din Banatul montan (România), în perioada 1990-2010

Ţara Almăjului reprezintă una dintre entităţile teritoriale de tip "ţară" din România şi singura de acest fel din Banatul montan. Este un sistem regional pur rural în care ierarhia şi centralitatea sunt cele două atribute considerate tipice pentru cele 31 de sate care definesc componenta de habitat a regiunii. Poziţia geografică a Ţării Almăjului constituie principalul element de restrictivitate în ceea ce priveşte dezvoltarea regiunii şi stabilirea interrelaţiilor cu sistemele regionale învecinate, aspect care a înscris-o în categoria peisajului rural montan. Din această cauză, practicile economice nu cunosc o diversificare accentuată, bazându-se doar pe valorificarea resurselor locale (în special forestiere şi agricole).
Acest aspect a cauzat o accelerare a impactului antropic asupra peisajului şi componentelor sale, rezultând transformări în tipologia peisajelor rurale almăjene. Modificările apărute le-am identificat în urma calculării unor indicatori de evaluare a calităţii peisajului pentru o perioadă de 20 de ani, luând ca an de referinţă, anul 2010. Rezultatele obţinute (*indicatorul de naturalitate* - 0.56, *densitatea populaţiei* – 15.1 locuitori/km², *presiunea umană prin terenuri agricole* - 2.84 ha/locuitor*, neagricole* – 4.54 ha/locuitor şi *forestiere* – 4.35 ha/locuitor, *indicatorul de mediu* – 1.5) redau starea actuală a mediului din sistemul rural Ţara Almăjului, evidenţiind practic antropizarea tot mai accentuată a peisajelor rurale montane după schimbarea regimului politic şi trecerea la economia de piaţă, în special prin acţiuni de defrişări masive.
Inventarierea situaţiei actuale a calităţii peisajului şi a modificărilor apărute în peisaj în regiunea studiată ar trebui să deţină un rol foarte important pentru comunitatea rurală montană almăjană, în vederea identificării unor măsuri de protecţie a ecosistemelor în scopul asigurării procesului de dezvoltare durabilă, în special a ecosistemelor forestiere, cel mai puternic afectate şi care deţin cel mai important rol în menţinerea echilibrului ecologic.

Cuvinte-cheie: *sistem regional, presiune umană, peisaj rural, utilizarea terenurilor, Ţara Almăjului, Banatul Montan*

Introduction

The landscape constitutes a very important *resource* in the practice of various economic activities, is a basic component of the natural and cultural heritage from any region and also constitutes an element of the social and individual well-fare. Starting from these premises, the study of landscape quality from a certain area has a major significance, mainly because it reflects the quality of the people's life from that area. . The landscape is thus considered "*the result of the action and interaction of the natural and/or human factors*" (the European Convention for Landscape, published in the Official Gazette, part I, no. 536, dated 23 July 2002), as well as "*a laboratory to understand the environment potential (…)*", (Le Dû-Blayo, 2011). Moreover, the importance of the landscape issue approach in a research of a purely rural regional system is as important as the change within the landscapes reflects the rural change, the degree of development of a rural region, its attractiveness as well etc. (Kizos et al., 2010).

In the case of a *semi-closed purely rural regional system* (Ianăş , 2011), (like the case of the territorial system of Almăj Land from the Banat Mountains, Romania), the landscape has an *identity value* as well (Pătru-Stupariu , 2011), allowing its inhabitants to identify with the space they live in, to shape as a unique group, and the respective region as *a mental space* (Cocean, 2008).

The natural, geo-demographic and habitat component, as well as the economic component of the regional system of Almăj Land register the region within the *mountainous rural landscape* (Vert , 2001) with a pastoral and agro-industrial economic functionality. Grazing, agriculture and wood exploitation are the three basic activities that differentiate the types of rural landscapes from the Almăj region. The rural landscape, as a part of the natural material heritage (CEMAT, 2000), has suffered changes over time through the intensification of agricultural and forest exploitation activities, with major repercussions on the environment.

Thus, the relation between the natural and the anthropogenic factors, as well as the human pressure intensity on the environment, have been analyzed using some elementary indicators of landscape quality assessment such as *the naturality index* (NI) in order to emphasize the proportion between the forests surface and the total surface of each of the seven administrative-territorial units belonging to Almăj Land. Its calculation was necessary to highlight the ecological state of Almăj Land rural system, including the degree of afforestation and offering the possibility to compare this rural region with other geographic regions from Romania: the Sub-Carpathian sector of the Prahova Valley (Armaș et al., 2003), Mostiștea Plain (Apostol, 2004), Oltenia Plain (Dumitrașcu, 2006), the Sub-Carpathians between the Râmnicul Sărat and the Buzău Valleys (Pătroescu & Niculae, 2010), Bran-Rucăr-Dragoslavele Corridor (Pătru-Stupariu, 2011), Bălăcița Piedmont (Ionuș et al., 2011), Bâsca Chiojdului river basin (Zarea & Ionuș, 2012). Other indicators that were determined are: *human pressure indexes – population density* (D) and *the human pressure through the use and occupation of the agricultural* (Pa), *non-agricultural* (Pna) and *forest* (Pf) lands; (Pătroescu et al., 1999-2000; Dumitrașcu, 2006; Pătroescu &Niculae, 2010; Pătru-Stupariu, 2011; Ionuş et al., 2011). The last calculated index was *the environmental transformation index* (Itre) that best emphasizes the relation between the natural surfaces and the anthropogenic ones. It was introduced and used for the first time to assess the human impact on the Sub-Carpathian landscape from Poland (Maruszczak, 1988), and then it was taken by Pietrzak (1988) to analyse the human impact by the development of settlements and farming in the Carpathian Foothills between the Raba and Uszwica rivers (Poland). In Romania, it was used to assess the landscape quality in the Sub-Carpathian sector the Prahova valley (Armaș et al., 2003), the Iron Gates Natural Park (Manea, 2003), Bran-Rucăr-Dragoslavele Corridor (Pătru-Stupariu, 2011), the Bălăcița Piedmont (Ionuș et al., 2011), the Bâsca Chiojdului river basin (Zarea & Ionuș, 2012) etc.

All these indicators have a major role in the intensification of protection and preservation methods of the Almăj rural landscape, as well as to preserve the ecological balance. In this case, the main objective of the study involves the identification of the most affected ecosystems from Almăj Land and the proposal of some protection measures for the environment.

Study area

The study area is located in the Mountainous Banat (from the South-West of Romania) and entirely overlaps the intra-mountainous Depression of Bozovici (Almăj), climbing in altitude on the highest peaks of the mountains: Semenic, Anina, Almăj and Locva.

From an administrative point of view, Almăj rural system belong to Caraş-Severin county and comprises seven communes (Bănia, Bozovici, Dalboşeţ, Eftimie Murgu, Lăpuşnicu Mare, Prigor and Şopotu Nou) with 31 villages (Fig. 1), among which interdependence relations have been set. The settlements are hierarchically structured (Bozovici - the only village with inter-communal functions and a role of the region's polarizing centre, six villages with functions of

Forum geografic. Studii și cercetări de geografie și protecția mediului
*Volume **XII**, Issue **1** (**June 2013**), pp. **43-51***
*http://dx.doi.org/**10.5775/fg.2067-4635.2013.034.i***

commune residence and 24 medium and small villages - 12 of them with less than 100 inhabitants), (Ianăș, 2007; 2011). All the settlements are located mainly in the meadow and the terraces of the Nera River, and the smallest ones climb even up to 900 m altitude. The economic component of the Almăj Land rural system has as basis two activities that define their functionality and set the types of rural landscapes: the agriculture on the one hand, the wood exploitation and processing on the other hand (Fig. 2). The two economic activities are supported mainly by the forestry resources and the agricultural lands in the region.

In 2010, forests accounted for 60.98% of the total surface of the regional system (66,103 ha), while the agricultural lands are ranked second, with 37.36% (40,515 ha), (Fig. 3). The comparative analysis of the two resources for a period of 20 years (1990-2010) shows a reduction of the forestry resources (through the intensification of defforestations) to the detriment of the agricultural lands, especially the grasslands. That is why we can speak of an agricultural-pastoral profile of the region, the grass lands becoming the basic source for animal breeding.

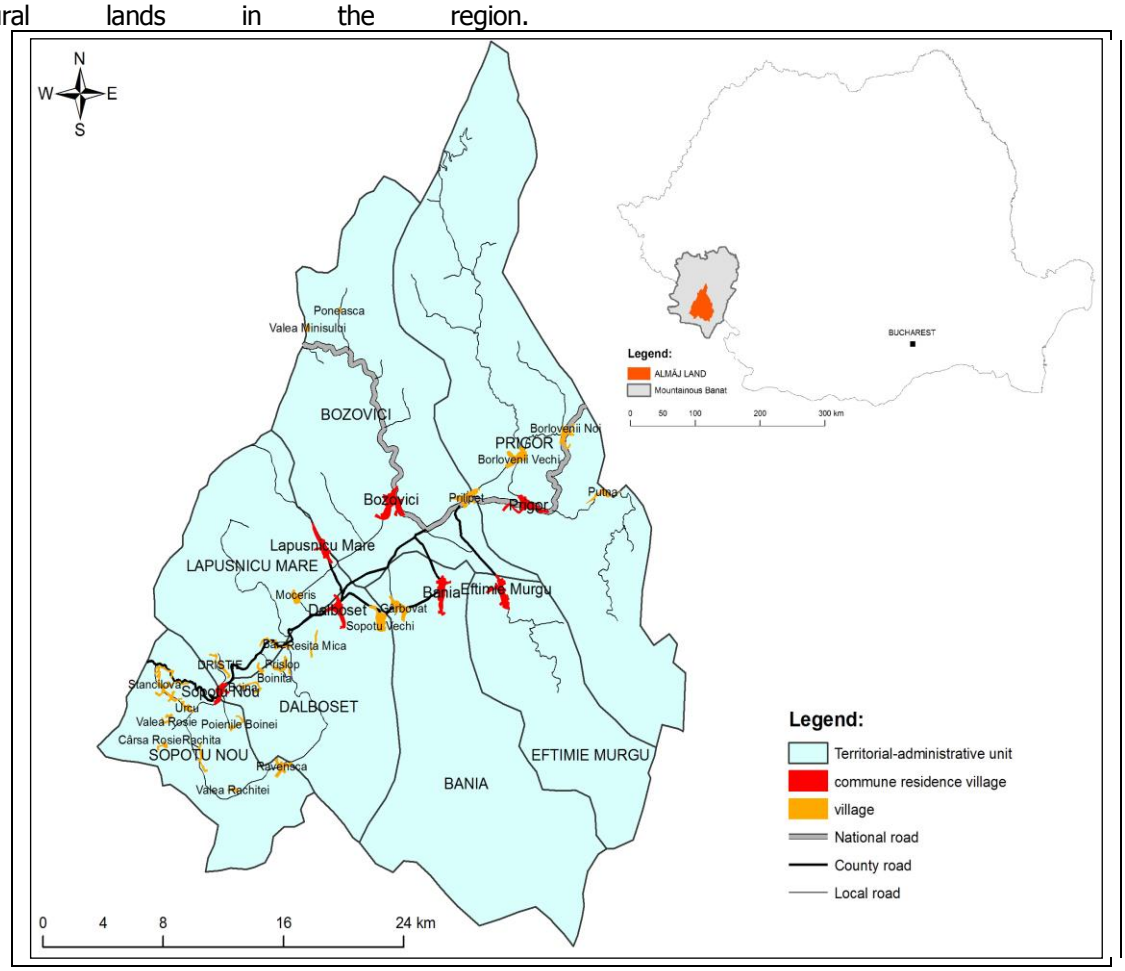

Fig. 1: Almăj Land – a pure Rural Regional System in Mountainous Banat (Romania)

Fig. 2: The mixed agrarian landscape in Răchita village (Şopotu Nou commune), Almăj Land

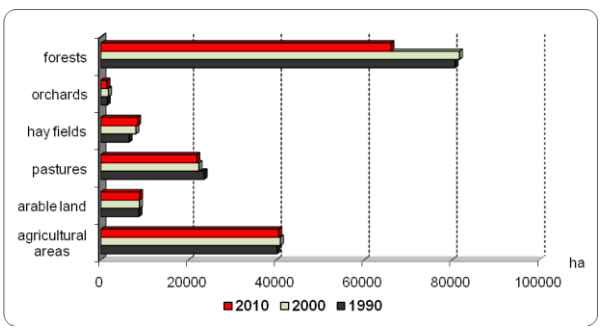

Fig. 3: Dynamics of land use in Almăj Land Rural System (1990-2010)

Materials and methods

A series of elementary indicators have been applied in the study herein in order to evaluate the landscape quality from the rural system of Almăj Land and to highlight the intensity of the anthropogenic impact on the natural environment, action more and more obvious after 1990, as a consequence of the change in the agricultural practice political system. Moreover, the inventory of the manner of land usages has helped us identify several types of landscapes (Lindenmayer & Cunningham, 2012) in the Almăj region.

The landscape indicators were calculated for the years 1990, 2000 and 2010 in order to observe the modifications that took place within the Almăj rural landscape, as a consequence of the anthropization process intensification. To calculate them, statistical data (for the years 1990, 2000, 2010) obtained from the National Institute of Statistics, Caraş-Severin (Reşiţa) Branch (Bănia, Bozovici, Dalboșeț, Eftimie Murgu, Lăpușnicu Mare, Prigor, Șopotu Nou administrative-territorial units), have been used, as well as the database drawn up by the European Environment Agency within the Corine Land Cover project (Bossardet al., 2000) for the years 1990 and 2006 (CLC 1990 and CLC 2006), data available at: *http://* www.eea.europa.eu. These data, with a resolution of 100 m, were re-projected in Stereo 70 projection system and processed with ArcGIS 9.3. software, following the model achieved by Rusu et.al. in 2010. By comparing the statistical data from 2010 with the ones obtained from CLC 2006, we have noticed that the differences are very small, reason for which we have not calculated these indicators for 2006 as well. To all these, we add as well the field observations that we performed constantly in order to verify the accuracy of the information obtained by processing the database and to demonstrate the typology of the rural landscapes existing in Almăj Land, mainly based on the economic criterion, directly resulted from the anthropogenic activity.

Results and discussions

The naturality index (NI) was calculated with the help of the proportion between the forests surface and the total surface of the considered territorial unit (Pătru-Stupariu, 2011; Ionuş et al., 2011), reflecting the forestation degree of the purely rural regional system of Almăj Land and from each commune. The calculation of this indicator is very important because the presence of the forest on extended surfaces ensures the ecological balance of the ecosystem. Practically, the high naturalness degree ensures a stable ecological balance. Considering the value of the naturalness indicator, according to which Ionescu & Săhleanu, 1989 (quoted by Pătru-Stupariu, 2011) set seven types of landscapes, in Almăj regional system only two categories are predominant: landscapes with an ecological balance similar to the initial one (for 1990 and 2000) and landscapes with a relatively stable ecological balance (for 2010), (Table 1). If in 1990 and 2000, in every commune of Almăj Land, the naturalness index exceeded 0.6 – the highest values (0.96) being registered in Dalboșeț administrative-territorial unit - (indicating the presence of the landscape with an ecological balance similar to the initial one), we notice that during the last ten years, the anthropogenic pressure on the forest (through deforestation) has intensified. Thus, there appeared two other categories of landscapes: landscapes with a relatively stable ecological balance (in Bănia, Lăpuşnicu Mare and Şopotu Nou communes – where the values of the indicator varied between 0.45 and 0.6) and landscapes with a slightly affected ecological balance (in Dalboşeţ commune - where the values of the indicator have been the lowest, 0.39), (Table 1 and Fig. 4).

Practically, for all the communes within Almăj Land, the surface occupied by forests shranked in the last 20 years and almost halved on the territory of Dalboşeţ commune (from 7470 ha in 1990, to 3061 ha in 2010), the wood exploitation and processing being the main industrial activity of the region's inhabitants.

The index of human pressure through the forest (Pf) is another index closely related to the naturalness index. This is one of the four indexes of the human pressure that we calculated for the Almăj Land regional system (together with the human pressure through agricultural and non-agricultural lands, as well as the population density). All four indexes of human pressure emphasize the quality and the artificial nature of the rural landscapes (Dumitraşcu, 2006) from Almăj Land.

The human pressure through forestry activities shows the forest surface per capita, but in order to maintain the environmental balance, F.A.O. suggest a limit of minimum 0.3 ha of forest/inhabitant. As we may notice in Table 1 and Fig. 5, the forest surface per capita has reduced at the level of the entire Almăj Land regional system (from 4.58 to 4.35 ha forest/inhabitant), with the lowest values recorded in 2010 in Dalboşeţ commune (1.76 ha forest/inhabitant); still, it does not affect the environmental balance.

The only exception is Prigor commune with the highest values of the Pf indicator (8.41 ha forest/inhabitant), because of the decline in the number of inhabitants (see population density).

Forum geografic. Studii și cercetări de geografie și protecția mediului
*Volume **XII**, Issue **1** (**June 2013**), pp. **43-51***
*http://dx.doi.org/**10.5775/fg.2067-4635.2013.034.i***

Table 1 Indicators used for landscape quality assessment in Almăj Rural System

Territorial administrative units	Year	Naturality index(IN)	Population density (D)	Human pressure through agricultural land (Pa)	Human pressure through non-agricultural land (Pna)	Human pressure through forest (Pf)	Environmental transformation indicator (Itre)
BĂNIA	1990	0.78	10.67	3.17	7.68	7.35	2.27
	2000	0.79	9.46	**3.85**	**8.65**	8.36	2.12
	2010	0.59	9.58	3.77	6.56	6.24	1.62
BOZOVICI	1990	0.63	20.64	1.98	3.65	3.07	1.51
	2000	0.87	17.84	2.2	4.21	3.76	1.66
	2010	0.61	17.55	2.21	3.72	3.48	1.53
DALBOŞEŢ	1990	**0.96**	25.48	2.2	4.04	3.8	1.67
	2000	**0.96**	**25.54**	2.67	4.03	3.76	1.37
	2010	**0.39**	22.52	2.96	**2.01**	**1.76**	**0.57**
EFTIMIE MURGU	1990	0.86	20.01	2.28	4.52	4.32	1.85
	2000	0.84	19.52	**1.82**	4.65	4.35	2.33
	2010	0.61	17.27	2.04	3.72	3.56	1.68
LĂPUŞNICU MARE	1990	0.65	16.72	2.65	4.55	3.89	1.44
	2000	0.63	17.49	2.61	4.3	3.61	1.35
	2010	0.52	14.4	3.16	3.76	3.61	1.1
PRIGOR	1990	0.74	11.28	2.14	7.1	6.63	**3.02**
	2000	0.77	10.24	2.49	7.84	7.52	2.95
	2010	0.73	**8.69**	2.92	8.55	**8.41**	2.81
ŞOPOTU NOU	1990	0.69	22.68	1.97	3.41	3.05	1.51
	2000	0.68	17.97	2.48	4.08	3.83	1.51
	2010	0.53	15.73	2.84	3.51	3.42	1.19
ALMĂJ LAND	**1990**	**0.75**	**18.21**	**2.34**	**4.99**	**4.58**	**1.89**
	2000	**0.79**	**16.86**	**2.58**	**4.81**	**5.02**	**1.89**
	2010	**0.56**	**15.1**	**2.84**	**4.54**	**4.35**	**1.5**

Source: Values obtained based on statistical data supplied by National Institute of Statistics and verified with Corine Land Cover 1990, 2000, 2006 database

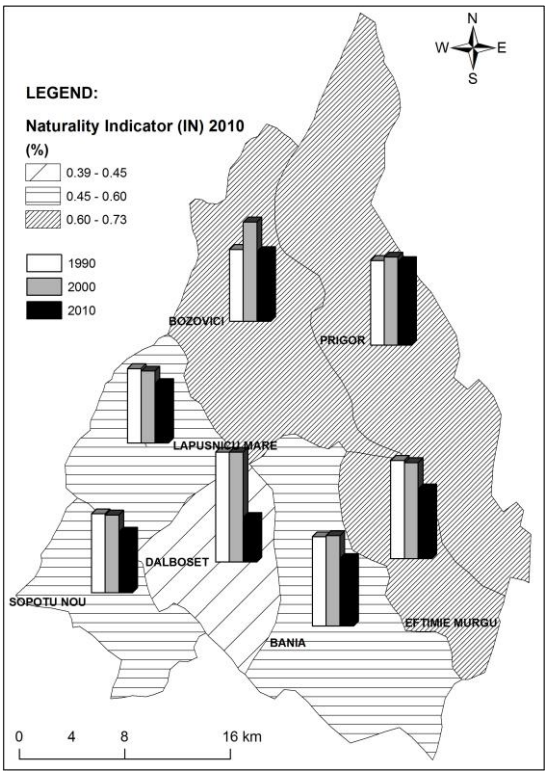

Fig. 4: Naturality index (IN) in Almăj Land

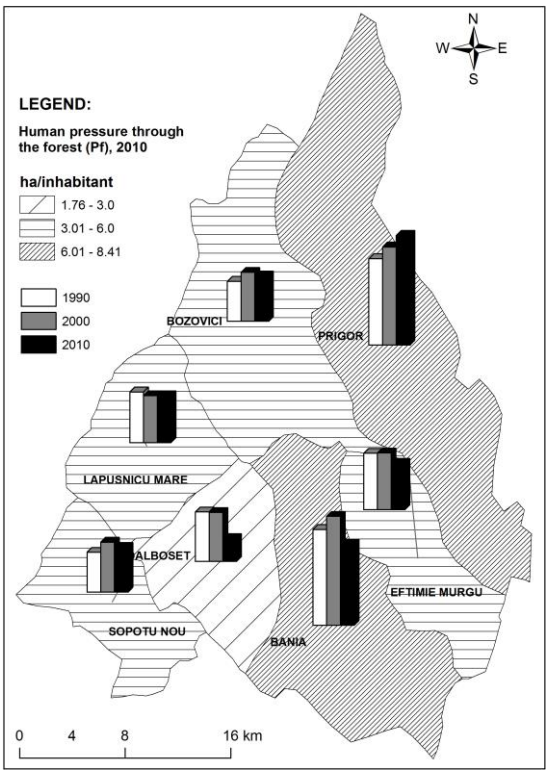

Fig. 5: Human pressure through the forest (Pf) in Almăj Land

After the forestry real estate, the agricultural lands occupy the largest surfaces, a significant part of them being obtained after defforestation. By analyzing **the human pressure through the use of the agricultural lands (Pa)**, we noticed an increase of this index values, from 2.34 ha/inhabitant in 1990, to 2.84 ha/inhabitant in 2010 (Table 1), respectively a change in the typology of the rural landscapes from Almăj Land.

According to the values of the human pressure on the agricultural lands, F.A.O./UNESCO has delimited four types of territories (landscapes), (Pătru-Stupariu, 2011). Among these, two categories have been specific for the territorial-administrative units of Almăj Land in 1990 and 2000, but these reduced to one rural landscape category in 2010.

Thus, during the period 1990-2000, Bozovici, Şopotu Nou and Eftimie Murgu communes represented highly unbalanced rural landscapes (especially Eftimie Murgu commune with the lowest values from the entire region – 1.82 ha/inhabitant in 2000) characterized mainly by crops, rarely with forest areas (landscapes defined by values of Pa ranging between 1.01 and 2.00 ha/inhabitant). The highly unbalanced rural landscapes were specific for the rest of the communes (where the values of the Pa indicator exceeded 2.00 ha/inhabitant – 3.85 ha/inhabitant in Bănia commune, the highest values from the region), i.e. the areas with intensive agriculture. The latter type of landscape has become specific for all the communes from Almăj Land in 2010, thus emphasizing the increased human pressure through the use of agricultural lands, with a maximum recorded again in Bănia commune, of 3.77 ha/inhabitant (Fig. 6). The situation is explainable considering the main agricultural economic profile of the Almăj Land rural system.

On the other hand, the **human pressure exercised through non-agricultural lands (Pna)** was evaluated, this category including the roads, the buildings and the non-productive lands. The spatial distribution analysis of the values of this indicator in Almăj Land has determined the shaping of a high pressure in the East of the regional system (with the highest values in 2010 in Prigor commune - 8.55 ha/inhabitant and Bănia commune - 6.56 ha/inhabitant - Table 1 and Fig. 7).

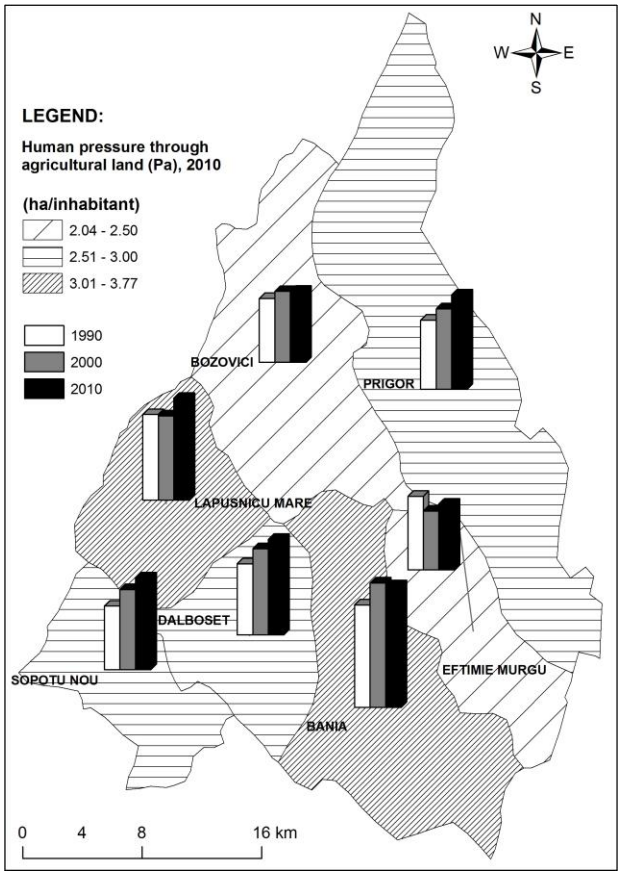

Fig. 6: Human pressure through agricultural land (Pa) in Almăj Land

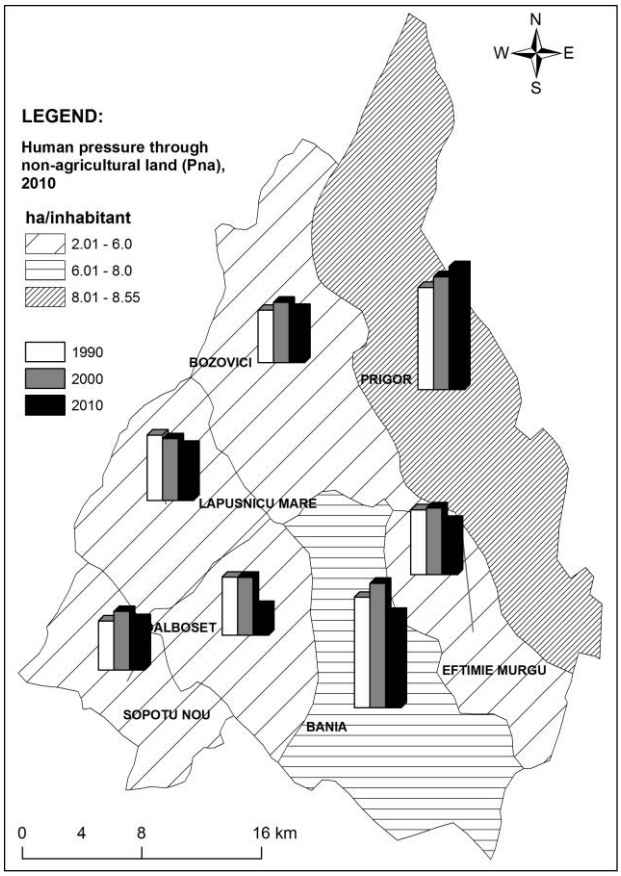

Fig. 7: Human pressure through non-agricultural land (Pna) in Almăj Land

Here, the human pressure is greater especially on the non-productive lands which occupy a large part of the territory of the two territorial-administrative units with a main extension in the mountainous space and less in the depression, which favours housing (see Dalboșeț commune with the lowest values of the Pna indicator – 2.01 ha/inhabitant in 2010).

The analysis of the statistical data associated to this relatively isolated rural system did not indicated an increase of the number of constructions or the occurrence of new roads, but the extension of the non-productive lands in the areas with the lowest population densities, many of the former agricultural lands being deserted, following the rural exodus and the population ageing.

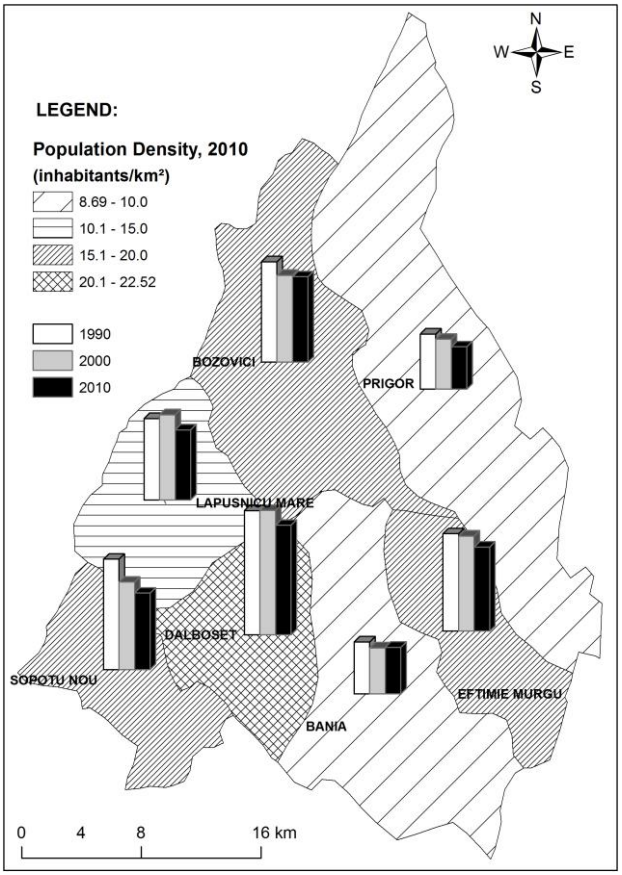

Fig. 8 Population Density (D) in Almăj Land

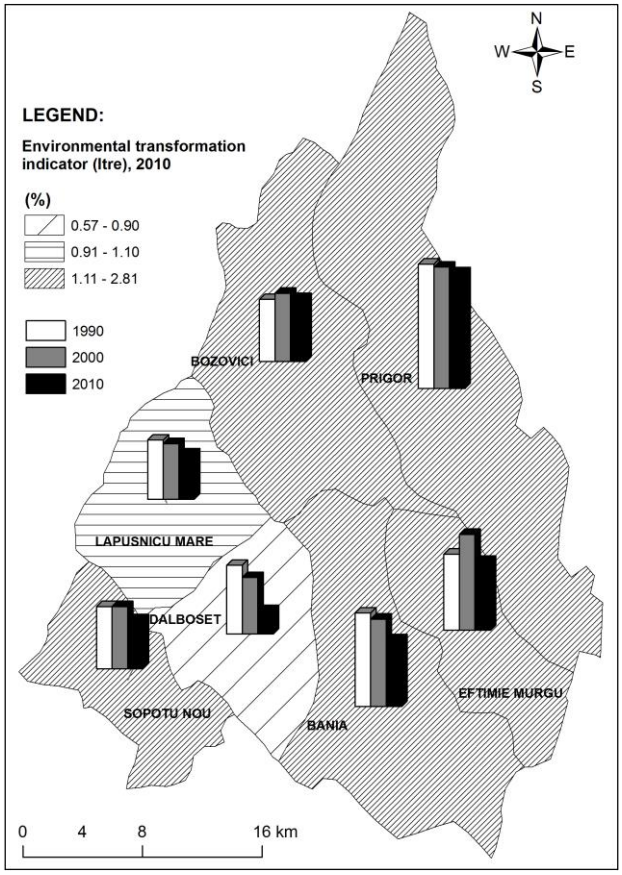

Fig. 9 Environmental transformation index (Itre) in Almăj Land

Regarding the **population density (D)**, this has known a decrease in the last twenty years in all the seven administrative-territorial units within the Almăj Land rural regional system, from 18.21 inhabitants/km² in 1990, to 15.1 inhabitants/km² in 2010. The lowest values of the population density were recorded in Prigor commune (8.69 inhabitants/km²), due to the large extension of the administrative-territorial surface of the commune, and the highest values of the indicator in Dalboşeţ commune (22.52 inhabitants/km²) whose surface is relatively small compared with the number of the population (Table 1 and Fig. 8). The values obtained explain the human pressure on the use of the lands that is larger here compared to the other territorial units forming the Almăj rural system. Moreover, the values of the population density rfor each commune and for the entire Almăj Land are much lower than 150 inhabitants/km², a value considered by the European Union a limit for the rural settlements (Pătroescu &Niculae, 2010).

The negative dynamics of the population of Almăj Land, a purely rural regional system, represents a specific feature of all the Romanian rural spaces, considering the same trend, especially after the transition from the socialist political regime to the democratic one. Several of the most important causes that have influenced the demographic phenomenon from the study area are: the decrease of the birth rate (consequence of the enactment of abortion and the change of the population mentality through the adoption of a western family model with 1-2 children/family, a typical aspect of the Banat region – „*the Banat family model*"), the international migration phenomenon and the rural exodus (especially of the young population), consequence of

the economic regression imposed after the restructuring occurred especially in the industrial sector after 1990 (Ianăş , 2011).

The **environmental transformation index was also determined (Itre)** in order to emphasize the relation between the natural surfaces and the anthropized ones (Pătru-Stupariu, 2011), using the following formula:

Itre = S forest / (S agricultural + S built)

This mirrors the degree of occupation of the soil and the anthropization degree of the Almăj Land rural system. The values higher than 1 for the period 1990-2000 reveal the predominance of the natural surfaces in all the seven administrative-territorial units studied. The rural landscapes from Prigor and Bănia communes is the least transformed, the index having the highest values (3.02, respectively 2.27). In 2010, however, the increase of the landscape anthropization degree is noticed, the landscape from Lăpuşnicu Mare commune having a fragile balance (from the natural - anthropogenic relation). Strongly anthropized rural landscapes appear in Dalboset commune, with the lowest values of Itre (0.57), (Table 1 and Fig. 9). Therefore, together with the naturalness index, the environmental transformation index also leads to the same conclusion: Dalboşeţ had the greatest anthropogenic impact in the entire Almaj land, a fact which reduced the specific quality of the rural landscape.

Conclusion

The analysis of the landscape quality in Almăj Land rural system (the values of the indexes from the statistical data being verifiable by Corine Land Cover model)pointed out the intensification of the anthropogenic activity on the mountainous landscape, through actions on the agricultural, non-agricultural lands, as well as forests. Very strong environmental pressures occur along the Nera valley and its tributaries, especially in Almăj depression, by the human pressure on the natural ecosystems. These practices may have cumulative effects with a negative impact on the biodiversity, being able to launch the ecological processes, with major impacts on the landscape quality.

We have also noticed that the degree of naturalness of the landscapes from the analysed rural system is ever lower. Naturality index values ranging between 0.3 and 0.6 indicate that more than half of the Almăj Land territory presents a relatively stable landscape, with slightly affected ecological balance, and the human pressure through the agricultural land defines a highly unbalanced rural landscape, by values higher than 2 ha/inhabitant in all the region's administrative-territorial units (in 2010).

Taking into account the results of the evaluation indexes of landscape quality, which we calculated for 1990, 2000 and 2010, as well as the economic function of the Almăj rural system, we can identify for the studied region two major categories of rural landscapes: *rural landscapes specific for the primary sector* and *rural landscapes specific for the secondary sector*.

Within the first category, the following subtypes were identified: the landscape of the closed cultivated fields (in Prigor and Lăpuşnicu Mare communes), the mountainous and hilly agricultural and pastoral landscape (in Bănia and Eftimie Murgu communes), as well as the mixed agrarian landscape (in Bozovici, Dalboşeţ and Şopotu Nou communes), while the second category comprises rural landscapes with an industrial profile related to the wood exploitation and processing.

In fact, the results of the Almăj rural landscape change have in common the policies practiced over time, and the transition to the market economy has led to a new *integrated rural policy*, instead of an agricultural, environmental policy, aiming at the determination of new types of relations between the rural community and the rural environment, aspects which are also available for other rural regions in Romania.

Considering all these aspects, especially the current condition of the landscape quality in Almăj Land rural system, some protection measures of the ecosystems are necessary: the afforestation of the sloping lands affected by geomorphological processes, soil erosion and the replacement of the pastures from Bozovici Piedmont and Nera depression with orchards (the climate with frequent sub-Mediterranean influences causing the crop growing season duration of about 280 days).

References

Apostol, G., (2004), *Câmpia Mostiștei. Studiu de geografie rurală*, Editura C.D. Press, București.

Armaș, I., Damian, R., Șandric, I., Osaci-Costache, G., (2003), *Vulnerabilitatea versanților la alunecări de teren în sectorul subcarpatic al văii Prahova*, Editura Fundației "România de Mâine", București.

Bossard, M., Feranec, J., Otahel, J., (2000), *Technical report No. 40*, Corine Land Cover Technical Guide-Addendum 2000, European Environment Agency, Copenhagen.

Cocean, P., (2008), Stages in the formation of the Romanian Mental Space, *Romanian Review of Regional Studies*, Volume IV, No. 2, Cluj-Napoca, pp. 31-42.

Dumitraşcu, Monica, (2006), *Modificări ale peisajului în Câmpia Olteniei*, Editura Academiei Române, Bucureşti.

EEA, (1994), *CORINE Land cover – Part 1: Methodology*, disponibil la adresa http: //www.eea.europa.eu /publications/COR0-part1

Ianăş, Ana-Neli, (2007), The Regional System of Almăjului Land – Typical Elements of the Habitat, *Analele Universităţii de Vest*, Seria Geografie, Timişoara, pp. 75-86.

Ianăş, Ana-Neli, (2011), *Ţara Almăjului. Studiu de geografie regională*, Editura Presa Universitară Clujeană, Cluj-Napoca.

Ionuş, Oana, Licurici, Mihaela, Boengiu, S., Simulescu, D., (2011), Indicators of the Human Pressure on the Environment in the Bălăciţa Piedmont, *Forum geografic. Studii şi cercetări de geografie şi protecţia mediului*, Volume 10, Issue 2/December, Craiova, pp.287-294.

Kizos, T., Primdahl, J., Kristensen, L.S., Busck A.G., (2010), Introduction: Landscape Change and Rural Development, *Landscape Research*, vol. 35, no. 6, December, Routledge, pp. 571-576.

Le Dû-Blayo, L., (2011), How Do We Accommodate New Land Uses in Traditional Landscapes? Remanence of Landscapes, Resilience of Areas, Resistance of People, *Landscape Research*, vol. 36, no.4, August, Routledge, pp. 417-434.

Lindenmayer, D.B., Cunningham, S.A, (2012), Six principles for managing forests as ecologically sustainable ecosystems, *Landscape Ecology*, February, Springer Science, doi:10.1007/s10980-012-9720-9.

Manea, G., (2003), *Naturalitate și antropizare în Natural "Porțile de Fier"*, Editura Universității, București.

Maruszczak, H., (1988), The transformation of natural environment during historical time, in Starkel L. (Ed.), *Transformation of geographical environment of Poland*, Ossolineum Publisher, Warszawa, pp. 99-135.

Pătroescu, Maria et al., (1999-2000), Ierarhizarea peisajelor rurale din Câmpia Română în funcţie de vulnerabilitatea la degradare şi suportabilitate a presiunii umane, *Geographica Timisensis*, vol VIII-IX, Timişoara.

Pătroescu, Maria, Niculae, M.I., (2010), The Rurality between the Râmnicul Sărat and Buzău Valleys – definitive component of the Subcarpathian Landscapes Dynamics, *Forum geografic. Studii şi cercetări de geografie şi protecţia mediului*, Year 9, No. 9, Craiova, pp. 107-114.

Pătru-Stupariu, Ileana, (2011), *Peisaj şi gestiunea durabilă a teritoriului*, Editura Universităţii, Bucureşti.

Pietrzak, M., (1988), Development of Settlement and Farming from the Neolithic Period to Date in the Marginal Zone of the Carpathian Foothills between the Raba and Uszwica Rivers, *Prace Geograficzne*, no. 103, pp.15-43.

Rusu, R., Man, T., Fodorean, I., Moldovan, C., (2010), The Analysis of Land Use based on Corine Land Cover in Romanian part of the Tisa Catchment Area, *Romanian Review of Regional Studies*, Vol. VI, No. 2, Cluj-Napoca, pp. 47-54.

Vert, C., (2001), *Tipuri de peisaje rurale din Banat*, Edit. Mirton, Timişoara.

Zarea, R., Ionuș, O., (2012), Land use changes in the Bâsca Chiojdului river basin and the assessment of their environmental impact, Forum geografic. *Studii și cercetări de geografie și protecția mediului*, Vol. XI, Issue 1, Craiova, pp. 36-44.

*** (1990, 2000, 2010) *Statistical Yearbooks* from the National Institute of Statistics, Caraş-Severin County.

*** (2000), *Convenţia Europeană a Peisajului*, publicată în Monitorul Oficial, Partea I, nr. 536 din 23 iulie 2002

*** (2003)*, European Rural Heritage. Observation Guide*. CEMAT, Council of Europe