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Surveying the Importance of Population and its Demographic Profile, Responsible for the Evolution of the Natura 2000 Sites of Bihor County, Romania

Abstract

The current study focuses on the demographic profile research of Nature 2000 sites belonging to 28 administrative entities located in Bihor County, in northwestern Romania. For the purposes of this study, out of the 74 local administrative units (LAUs) holding protected areas of the type Nature 2000 while only sites that cover over 40% of the administrative entities' area were taken into account. Starting from the interrelation of the contact between human communities and local ecosystems, the research sought to determine the interdependence level between the local residents' lifestyle and the biodiversity-related maintenance/ preservation of these protected areas.

Based on the referenced statistics, more demographic indicators were calculated (population decrement, population density, structure by age, dependency index, active population and structure by industry) and basic indicators of pressure on the environment (naturality index, human pressure through land use and forest area per capita). Each of these factors are meant to reveal how man cohabitates with nature in a balanced or disrupted manner according to the study results. Thus, considering the 28 LAUs from case to case, areas where environmental health tends to insecurity were identified, but there are cases in which it is

satisfactory thanks to the existence of massive woodlands over wide areas, while also being due to a considerable demographic decrement.

Key words: population, Nature 2000 Sites**,** LAUs, demographic indexes, indexes of pressure on the environment

Introduction

With regard to the ***Nature 2000 ecological network***, studies and research have been developed to a large extent, standing ou oft those with an empirical load or thematically related to the protected envionments of the Romanian territory (Iojă et al. 2010; Bodesmo et al. 2012; Hoyos et al. 2012; Pietrzyk-Kaszyńska et al. 2012; Marandi et al. 2014; Jones et al. 2015; Dupont et al. 2016). The specialised Romanian literature emphasises that, in 2010, over 96% of the new protected areas (Nature 2000 sites) were already overlapping the existing protected areas (nature reserves, monuments of nature, nature or national parks), although there are certain difficulties for the featuring of the phyto or zoological elements (Iojă et al. 2010).

A serious concern is raised about *the thin line which is difficult to trace* between what is natural and what belongs to society. However, the choice of conserving certain environments gives precedence to the man-environment relationship (Cenar 2009). It is also expressed by the ecological value and economic costs (Ando & Getzner 2006), where protected areas are often *owned or managed by private actors* (Young et al. 2013). They are also interested about *land prices*; namely, the agricultural land within protected natural areas, an interest in which is attributed to pressure from densely populated urban areas located near protected areas (Abelairas-Etxebarria & Astorkiza 2012).

The existing literature cites four principal approaches to the complex relationships between residents and protected areas: access to resources; demographic changes; the attitudes manifested by local communities; and communities and stakeholders' involvement.

Access to resources is fundamental to the lives people lead from within a protected area. Studies from the specialist literature refer to *agricultural and non-agricultural resources (evironment-related).* They admit that many trigger poverty for rural communities in the vicinity of a protected area (as

in the case of Tanzania), including damage caused by wildlife (Vedeld 2012). In Europe, extensive farming has proved to be essential for the maintenance and encouragement of biodiversity in protected areas (France – Dupont et al. 2016), but negative effects have also been reported, such as underground mining affecting a swamp of an Estonian protected site (Marandi et al. 2014).

We need to admit the fact that the *use of mineral agricultural* or *forestry resources* by residents or entrepreneurs in a protected area inevitably afflicts its biodiversity and ecology. On the other hand, there are results which indicate *a loss of control of local rural population* over natural resources, as in the case of Austria. Here, gogovernance initiatives have been set in place through the negotiation of international or local regulations to meet their land use needs (Penker 2009). In Romania, declaring the Nature 2000 protected areas in an „emergency" regime (certain criteria had to be met for the accession to the EU) has led to restrictions and prohibitions on territory use and its related resources (Primack et al. 2008). As a consequence, gaps concerning a clear-cut territorial delineation of these protected areas have favoured a massive anthropogenic intervention by logging, the extraction of useful minerals and development of tourist infrastructure (Iojă et al. 2015).

Bihor county, lying within the Nature 2000 protected areas, contains a wide range of resources, including forestry, arable land, thermal waters and underground resources of prime importance, with the welfare of local communities being closely related to their exploitation. An important set of information is revealed by studies about the ***attitudes manifested***; *an exploration of environmental psychology* of human individuals versus *protected environments*, there being an obvious, direct correlation with access to resources.

Following this trend, the protected areas of the Natura 2000 network include the Spanish and Basque community (Hoyos et al. 2015) as well as the Polish one (Pietrzyk-Kaszyńska et al. 2012; Chmielewski & Głogowska 2015), alongside the Romanian one (website 4). For example, protected areas are indicated as areas contested by small farmers or Ethiopian shepherds, challenging the boundaries of a national park, land use and the involvement of local people in the act of good management (Kelboro and Stellmacher 2015). Most often, the contact between locals and restrictions of a protected area often go hand in hand with conflict triggered by the establishment of protected areas as a point of resistance and conflict practices, but also as a driver of *sustainable practices officialisation* (Pieraccini and Cardwell 2016).

The attitudes and awareness of Nepalese villagers at the edge of a protected area are also interesting; namely, the protected statute of a *varan* species, as children are more responsible for species conservation than adults (Ghimire et al. 2014). Certain documented studies shed light on *conflict resolution* that refer to biodiversity conservation. Between landowners wishing to exploit certain natural resources of protected areas and managers of these protected areas, solid and trustworthy relationships can be built with patience (Cigna 2001; Young et al. 2016). Furthermore, land use even draws upon judicial models as a *reasonable compromise* for the management of protected areas, as in the case of the Phillipines (Verburg 2006).

Bihor County also subscribes to the above model, mainly referring to the conflict which arises because the diminishing access to resources (especially to timber from forests, but also for changing the purpose of certain land use categories) translates into the stubbornness of some local communities who struggle openly and angrily (website 5) with the administrators or custodians of protected areas. Thus, a Nimby syndrome (Not In My Backyard) may be identified.

Another set of studies that interests the format of this article refers to the ***demographic changes,*** referring to the key factors responsible for the loss of biodiversity in a protected area. Biodiversity loss due to the residents' potential impact from terrestrial ecoregions for preservation is very important. On this occasion *population growth and high-density rates* are signaled in such protected territories, as well as a *decrease in fertility*, followed by a *change in the population age pattern*; namely, a shift from a predominantly young population to more aged individuals (Cincotta et al. 2000; Williams 2013).

In some other situations, studies have referred to a population living inside the protected area or its vicinity focus on the phenomenon of migration. This is how some researchers explain the high increment to tens of thousands of households and population density of up to 1.5 times higher than in more distant places of a protected area in western Uganda (Hartter et al. 2015).

Human population density in South African national parks is treated in terms of its *predictor* quality for the invasive species having a negative impact on biodiversity (Spear et al. 2013). The demographic analysis is also used to weight the load a population carries by exerting pressure on the biodiversity of certain habitats that require protection (Cirtina & Gamaneci 2015), so setting up tailored policies to preserve species. This approach is also relevant for the socio-demographic changes related to the land use in the vicinity or

inside the protected areas (Hoyos et al. 2012). In relation to Bihor County, demographic mutations seem favourable to the sustainability of Nature 2000-sites, especially by the demographic pressure decrease.

There are thorough statements about *the involvement of the community and all stakeholders* in the management of Nature 2000 sites (Apostolopoulou et al. 2012; Young et al. 2013), meaning that residents agree to various forms of *participatory and collaborative management* (Dimitrakopoulos et al. 2010) and social factors that influence such a decision (Jones et al. 2015). *Not knowing the needs of people* living in protected areas or near them, the imposition of specific land use models by management plans, are less accepted by the same community as in the case of a national park in southern Ethiopia (Kelboro & Stellmacher 2015). It has been shown that there is correspondence between the *growth and wellbeing* of Andalusian localities and the fact that the latter belong to protected areas for many years (Bonet-García et al. 2015).

The topic about *low deforestation rate* has also been analysed in relation to the occupation of protected areas and indigenous territories compared to other lands in Panama (Vergara-Asenjo & Potvin 2014). In protected areas, a sustainable activity is performed, but studies found a situation of *poor efficacy in reducing poverty*, especially for residents of the protected areas or close to them (Miranda et al. 2016).

To meet the goals of this study, only related references were selected synthetically, those which pinpoint the research directions and supported the current results. The demographic analysis was mainly pinpointed by the research of Cincotta et al. (2000) and Williams (2013), using the qualitative analysis model for protected areas concerning the growth, density, fertility rates and the age structure of the population. For the part of the study which combines conservation with development aspirations of the population from protected areas, Adams et al.'s (2004) model was used, which aims to achieve results that can control, reduce and even eradicate locals' poverty from within or nearby the protected areas.

Aim of the Study

The study refers to the Natura 2000 sites of Bihor County, focusing on a sequence of the human communities and local ecosystems interdependency so as to register the viability of the protected areas' system (mainly the

maintenance of the ecological diversity). To meet the goals of the study we proceeded to analyse certain significant demographical indicators which can prompt the exertion of the human pressure on the enviornment. This is due to the fact that among local communities who live within or in the close vicinity of the Natura 2000 sites, there is a certain mistrust of their viability and cooperation willingness for their proper functioning.

In this study, we aim to make an assessment of the demographic profile of the LAUs comprising the Natura 2000 sites and determine some pressure indexes which humans exert over the environment/landscape of the protected areas.

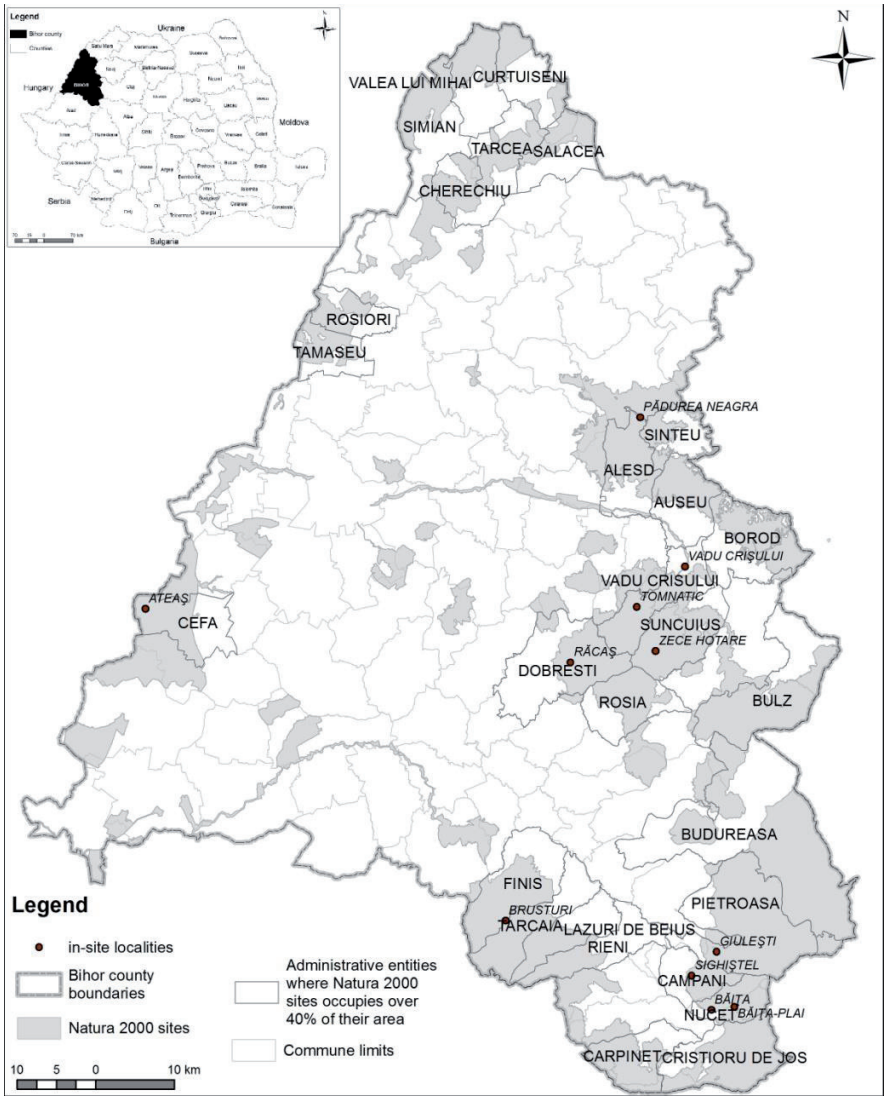
Area of Study

The current analysis has targeted the protected areas of Bihor County in north-western Romania (Fig. 1). In Bihor County, protected areas are spread over 30,867 ha, which accounts for over 4% of the entire area of Bihor (7,544 sqkm) county. Within the protected areas layout, 37 Natura 2000 sites are spread out over 74 local administrative units (LAUs) (Fig. 1, Table I). The human settlement network of the LAUs analysed comprises 113 localities of which 11 localities are in-built area ithin the protected area perimeter such as: *Ateaş* (Cefa commune), *Băiţa* and *Băiţa Plai* (Nucet city), *Brusturi* (Finiş commune), *Giuleşti* (Pietroasa commune), *Pădurea Neagră* (Aleşd city), *Răcaş* (Dobreşti commune), *Sighiştel* (Câmpani commune), *Tomnatic* and *Vadu Crişului* (Vadu Crişului commune) and *Zece Hotare* (Şuncuiuş commune).

Table 1. The share of occupied areas of Nature 2000 sites in the LAUs of Bihor

Percentage (%)	over 40	between 10,1 – 40	below 10	without sites	Total LAUs
The number of LAUs	28	26	20	27	101

Figure 1. Nature 2000 sites of Bihor county. In the upper left corner – location of Bihor county at the level of Romania



Methodology

The Natura 2000 network was implemented in Romania along with the pre-adhesion process to the EU to obtain reference data, while the demographic profile analysis was elaborated based on population census statistical data and the file of the locality (DJS – Bihor). Thus, the numerical evolution has been followed during 1992-2011, but for the other demography indexes we mainly refer to the last census of Romania (2011). The limits and areas of the Natura 2000 sites are taken over from the database of the Ministry of the Environment, Waters and Forestry (website 2) and cartography is made in ARCGIS. To determine the naturality index we start from the precept: low human pressure – increased biodiversity (French methodology, website 1), but a simple calculation formula was used which takes into consideration the forested area of a referential unit (in our case the LAUs) (I.N. = Forest area/ Total area).

Within this scope, from the category of the protected areas of Bihor county we took into account the Natura 2000 sites (represented by the SCI –sites of community importance and APS-avifauna protection sites) which hold at least 40% of its area at the level of the LAU. We deem that the value of 40% is enough for human pressure to trigger visible environmentally-related outcomes. Thus, out of the 74 LAUs which overlap these protected areas, 28 administrative entities were identified, which cover 40% of the Natura 2000 sites (Table I) and which constitute the main aim of the study. Three of them are cities (Aleşd, Nucet, Valea lui Mihai), and the remaining part belong to the rural milieu. For instance, in the Şuncuiuş commune, the protected area holds 85.2% of its surface, while in Pietroasa commune it holds 84.5% and in the Vadu Crişului commune it holds 75.2% etc. On the territory of these LAUs there are nineteen Natura 2000 sites, of which thirteen are SCI and six are APS.

Results and Discussions

To meet the goals of the study, we have proceeded to analyse some significant demography indexes related to human pressure on the environment (i.e. numerical evolution of the population, population general density, age group

pattern, active population, population activity-related pattern). To highlight the human pressure features in the Natura 2000 sites, we have determined the naturality index (NI), human pressure by forestry (HPF) and human pressure by agricultural lands (HPAL).

Demographic decrement. The 28 LAUs of the Nature 2000 sites which were taken into consideration subscribe to the general population decreasing trend, manifested at a country level too. These ranged from 103.601 inhabitants in 1992 to 98.107 inhabitants in 2002 and 91.968 inhabitants in 2011 (Fig. 2). Thus, from 1992 – 2011 the decreasing rate is -11.2%.

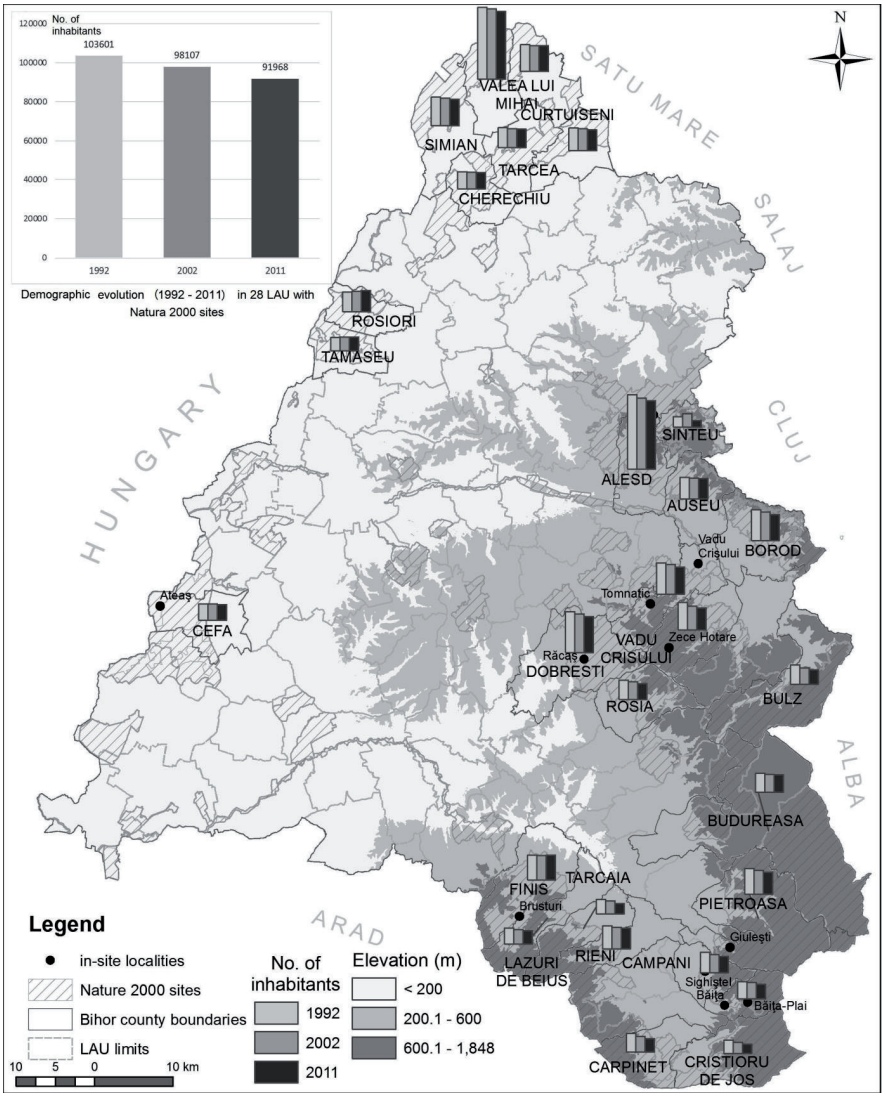
In terms of residence milieus, there is a demographic disparity between the urban and rural milieu. At the level of the three cities, including Nature 2000 sites, the population decrement is of -7.6% but in the rural milieu it is higher (-8.9%). At the level of communes, two of them register an increment (Roşiori 6.6% and Tămăşeu 1.3%), the other ones register lower rates ranging between -0.1% (in Finiş commune) and -33.6% (Şinteu commune).

Generally, the highest population decrement rhythms can be noted within mountain communes in the so-called far-stretched rural milieu where the economic potential is reduced; a fact which triggers obvious population instability. Such is the case of the communes of Şinteu (-33.6% decrement rate), Crişţioru de Jos (-31.6%), Lazuri de Beiuş (-29.1%), Cărpinet (-28.8%), Bulz (-26.2%).

If we refer to the 11 localities at the heart in the Nature 2000 sites (fig. 1), they follow the main decreasing trend and among them, Brusturi village (Finis commune) is almost extinct (with only 4 inhabitants in 2011).

The population density is an important demographic index for the functioning of a socio-economic system. Hoewever, it also shows the level of human load being, in the meantime, a pressure index on the environment. Pătru-Stupariu (2011) considers that a lower density than 1 inhab/sqkm allows for an activity in balance with the environment and a density *over this value* indicates the visible sign of a certain pressure on the environment.

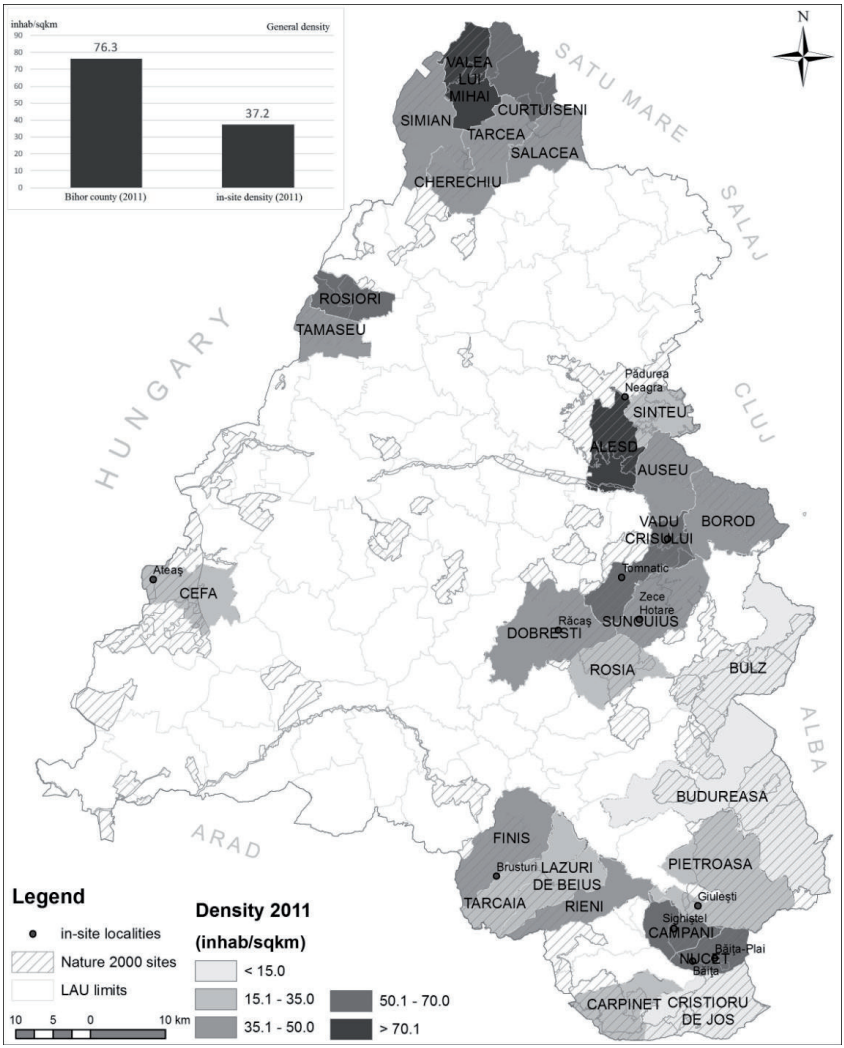
Figure 2. Hypsometric map of Bihor country, distribution of Natura 2000 sites and numerical evolution of the population between 1992-2011



The average density of the 28 LAUs is of 37.2 inhab/sqkm (year 2011), lower than the average density of Bihor County (76.3 inhab/sqkm). The highest values of the general density are recorded in the urban perimeter (Aleșd with 139.4 inhab/sqkm, Valea lui Mihai with 135 inhab/sqkm) (fig. 3).

In the rural milieu, high population density can be recorded in the low relief plain areas (Roşiori with 63.8 inhab/ sqkm, Curtuişeni with 54.3 inhab/sqkm, Cherechiu with 45 inhab/sqkm) or in the intramountainous depressionary areas (Vadu Crişului with 53.7 inhab/sqkm). The lowest density communes are found in the mountain areas (Budureasa with 7.9 inhab/ sqkm, Bulz with 14.8 inhab/sqkm).

Figure 3. General density of the population (year 2011)



Following the general population density in the eleven villages with their in-built within the Natura 2000 sites, we find out a higher concentration within the villages of Giuleşti (936 inhab/sqkm), Pădurea Neagră (1,201 inhab/sqkm) and Sighiştel (1,493 inhab/sqkm) which are found in the forested mountain area, where the in-built area coverage is limited (fig. 3). The villages of Tomnatic (126 inhab/sqkm) and Zece Hotare (130 inhab/sqkm) are also located in the mountain area, but the areas were deforested long ago and the hearth of the village has been growing ever since. At the opposite end is the village of Brusturi (4.4 inhab/sqkm) which will soon become extinct.

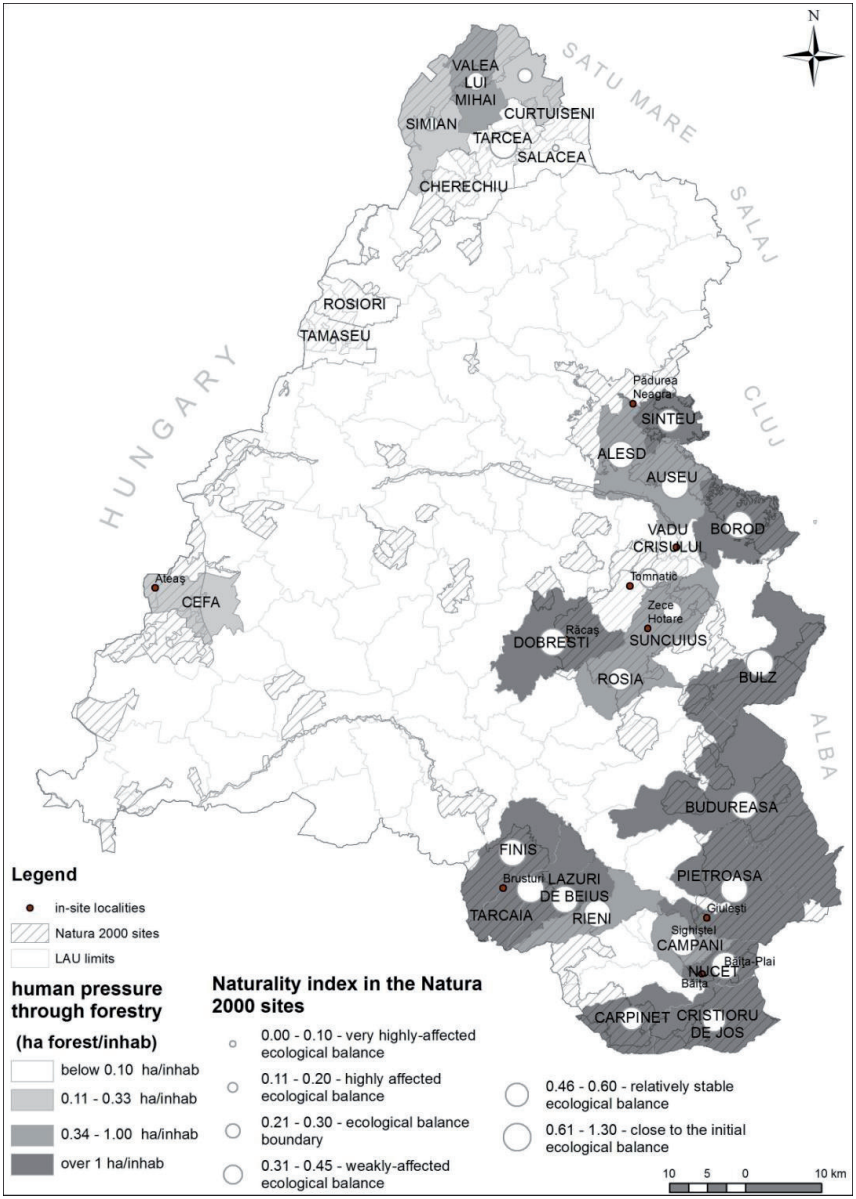
To capture the changes/disruptions which a system can hold without passing over the threshold which triggers a different stage (in the literature it is referred to as socio-ecological resilience: Resilience Alliance 2010; Drăgan 2015), we resorted to the analysis of some basic pressure indexes on the environment (Pătroescu 2000; Pătru-Stupariu 2011).

The level of human load (by general density) correlates with the ***naturality index*** (NI), in the context in which the forest is a first-range economic resource, the more exploited as the area is more populated. Illegal deforestations of Romania, including Bihor County are notorious and their impact resides in the fragmentation of habitats, soil erosion, landslides, flood frequency increase etc.

Within the Natura 2000 sites, the forest plays an essential role and represents the main driver of the modern land use through the naturality index of these protected areas. Owing to the fact that there are few areas with their in-built in the sites, it seems that once the area is declared as protected, then theoretically its related forests and ecosystems have better survival chances at least within mountain regions and partly the hilly ones.

Fifteen Natura 2000 LAUs are found in this situation where the ecological balance is closer to the initial one (over 0.6) (Dobreşti, Budureasa, Pietroasa, Rieni etc). In the plain areas, compact forested areas are of major importance and include here the LAUs with sites at or below the ecological balance boundary: Şimian (0.29), Tămăşeu (0.21), Cefa (0.12), Cherechiu (0.16), Curtuişeni (0.21), Roşiori (0.08), Sălacea (0.076) (fig. 4).

Figure 4. Naturality index and human pressure through forestry (HPF)



Closely connected to the naturality index is ***the forested area per capita*** (referred in the literature as human pressure by forestry – HPF). At the level of Romania, the latter is 0.33 ha forest/capita (website 3) and in Bihor it is of 0.36 ha/capita (year 2011). The FAO-suggested boundary for the maintenance of the ecological balance is of 0.3 ha forest/capita (Pătru-Stupariu 2011). Within the 28 LAUs, the average is 0.7 ha/capita, but this value is higher in the communes located in the mountainous areas which stretch over extended forest areas (fig. 4). The plain-positioned LAUs with symbolic forested areas are found at the opposite end (Tămăşeu with 0.003 ha/capita, Roşiori with 0.006 ha/capita, Sălacea and Tarcea with 0.007 ha/capita) (fig. 4).

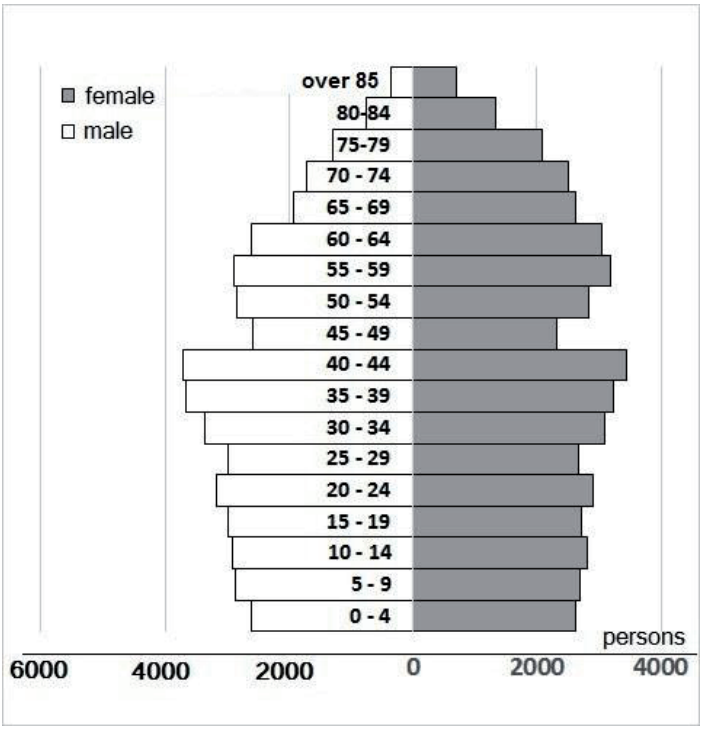
The major population age group pattern reflects the generations' chronology, revealing the unbalances which appear at the population level. For this indicator, the major age groups of 0-19 years (young population), 20-64 years (adult population) and 65-over 65 years (the elderly) were taken into consideration. A low birth rate along with the outflow (to the urban milieu or abroad) increases the demographic aging phenomenon. For the LAUs which overlap the analysed Natura 2000 sites, the population weight of over 65 years was 16.5% in 2011, almost similar to the country average (16.1%) but higher than in Bihor county (15.1%). The young population stands at 21.4% (for comparison: 21.4% in Romania and 22.2% in Bihor) while the adult population is 59.4% (in Romania 62.5% and 62.7% in Bihor). This situation differs slightly for each LAU, but the age pyramid marks the general trend of demographic aging in the 28 LAUs of Bihor County (fig. 5).

In terms of residence milieus, the younger age level registers a relative balance (24.2% in the rural and 23.9% in the urban). In the case of adults, there are already differences within the two LAU categories (58.3% in the rural and 62.8% in the urban milieus) which become obvious for the elderly (17.5% in the rural and 13.3% in the urban milieus) (fig. 6, fig. 7).

Stemming in the age group pattern, ***the dependency index*** for the elderly is 21.1% in the urban milieu and 30% in the rural milieu. If we also add the young population, this index maintains the following percentages: 59.1% (young-old) for the urban milieu and 71.5% for the rural milieu.

Following the weight of the **active population**, the highest values are recorded in the urban milieu (Valea lui Mihai with 44.2%, Aleşd with 32%, Nucet with 22.7%). However, in the rural milieu this index value is in many cases below 10%, while this situation is greatly triggered by the quite enhanced demographic aging level.

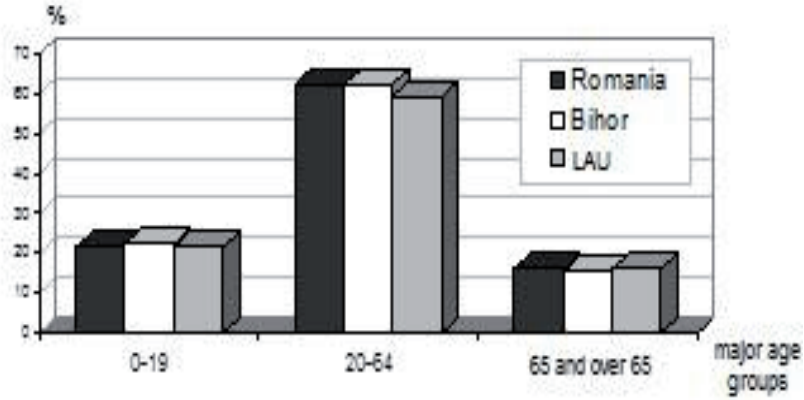
Figure 5. Population age pyramid



In terms of **activity sectors**, the secondary sectors detain the most significant weight (54.3%), due to the three urban localities' presence. We should also mention that in the Rieni commune (87.5%) there is an industrial unit which concentrates the largest share of the active population from the commune and its outskirts. Services register an average of 41.7%, but they are well represented in each LAU. The primary sector activities only absorb 4% of the active population, but the largest share of the agricultural fields is worked by the population which is not employed (the unemployed, socially-assisted persons, the elderly). Thus, in the land stock pattern, the large share of agricultural lands (over 50%) can be noted, of which the arable ones represent 51.1%, pastures and hay fields 47.9% and vineyards and orchards with their related nurseries account for 1%. If we follow the agricultural lands' spread per relief steps, then it is easy to note their prevalence in the plain areas (over 80%). This fact is emphasised by another pressure index on the environment,

namely ***human pressure by land use*** which gets "higher as the agricultural area weight per inhabitant is higher" (Pătroescu et al. 2000).

Figure 6. Share of major age groups (România, Bihor county, Natura 2000 LAUs)



Agricultural lands (arable, pastures, vineyards and orchards) were used as an index in this case. Thus, *human pressure by land use* (HPLU = agricultural area/no. of inhabitants) is lower in the LAUs of the mountain areas and in the intra-mountainous depressions where a subsistence agriculture is carried out. In these areas, the HPLU witnesses certain variations in the sense that they are certain administrative territories where the share of agricultural fields is reduced (0.41 – 1ha/capita – fig. 8). Furthermore, the environment is still balanced here and the landscape is characterised by the alternation of cultivated areas with areas for other usage (built space, but especially forestry blocks). There are also communes (those of the intra-mountainous depressions) where these land categories are spread over large surfaces as a result of deforestation and the environment is unbalanced (1.01- 2.0 ha agricultural lands/capita (fig. 8).

Field-located LAUs (fig. 8) feature highly unbalanced landscapes (over 2 ha agricultural lands/capita) where agricultural lands (mainly the arable) are spread over large surfaces. Although the communes of Şinteu (3.3 ha/capita), Criştioru de Jos (3.4 ha/capita) and Budureasa (4.2 ha/capita) would fall in this category, pastures and hay fields are spread over large areas and their presence does not necessarily hint at a major unbalance, as is the case of arable lands.

Figure 7. Major age group structure and demographic aging index

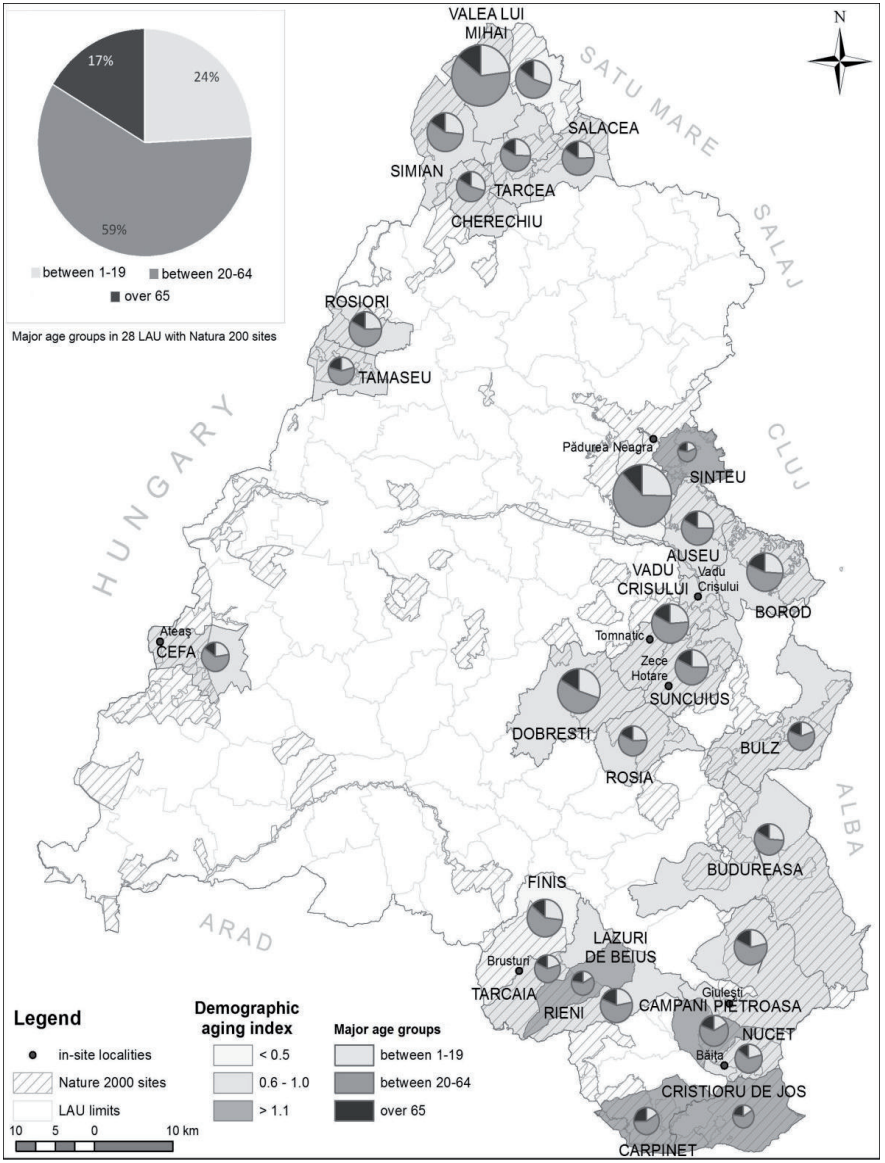
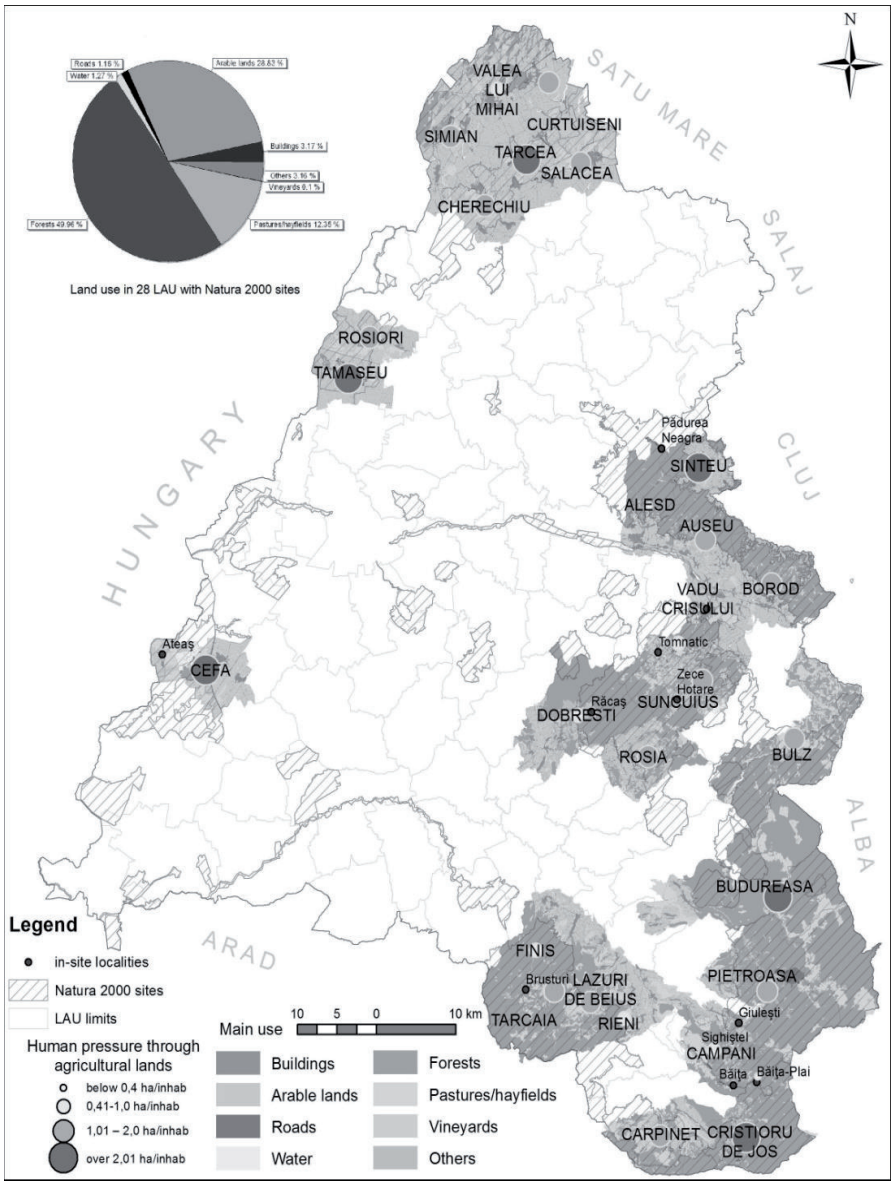


Figure 8. Land use and human pressure through agricultural lands (HPAL)



Conclusions

This research was accomplished by results that support the analysis of demographic indicators and pressure on the environment.

Demographic indicators highlight the circumstances indicating a disproportionate evolution, not very encouraging for the human communities' future of these protected areas. It has a decreasing rate in the number of inhabitants (-11.2%) during the period 1992-2011 and is more enhanced in villages included entirely in the protected areas, especially those located in mountainous areas as its likely causes are related to demo-economic development. The overall population density shows a greater concentration in cities and a lower one in rural areas, with some nuances present (they are higher in intermountain depression areas).

The major age group structure indicates the adult population prevalence (59.4% in the 28-analyzed LAUs), but there is also a demographic aging trend. Belonging to the area of residence indicates a close balance of the young population (24.2% and 23.9% in rural areas), while for adults there are slight differences between the two categories of LAU (58.3% in rural areas and 62.8% in urban areas) and the elderly are becoming more numerous in rural areas (17.5%) versus the urban (13.3%). For the elderly, the dependency ratio is 21.1% in urban areas and 30% in rural areas and for young people. Hence, this indicator maintains the trend of 59.1% for urban and 71.5% for rural areas.

Other indicators reflect the partly inconsistent and insufficient involvement of the population in a sustainable exploitation of natural resources within their sites or nearby. The highest rate of the active population (workforce) is in urban areas (from 22.7 to 44.2%), while in rural areas this indicator is below 10% in many cases largely due to the high number of the elderly and the existence of a relatively small number of viable economic projects. By activity branches, the secondary sector has the highest percentage (54.3%, due to the presence of the three cities), with services involving a significant human contingent (an average of 41.7%, well represented in each LAU) but the primary sector activities are underrepresented (only 4% of the workforce). In the land structure, the high share of agricultural land (over 50%) stands out, of which the arable land is 51.1%, pastures and hayfields 47.9%, with orchards, vineyards and associated nurseries at 1% as lands that are especially worked by the unemployed population.

Taken from the analysed sites as a whole, *the basic pressure indicators on the environment* highlight an encouraging situation for local environmental health despite some demographic and economics-related shortages and deficiencies. The naturality index (IN) shows that in more than half of the Natura 2000 sites analysed in the study, the ecological balance is close to the original (above 0.6), overlapping the villages in mountainous and hilly environments. A notable exception is in the north of the county where, owing to plains and low hills that are home to marshes and steppe vegetation, the ecological balance is relatively stable, despite a major humanisation and economic exploitation of natural resources.

The forest area incumbent per capita (human pressure through forestry) indicates an average of 0.7 ha/capita in the 28 LAUs. Mountain areas feature large forested areas (about 1 ha/capita in nearly half of the LAUs), while western lowland areas of the county feature limited forested areas (average of 0.003 to 0.007 ha/capita).

Human pressure through agricultural land (HPAL) is lower in the LAUs of mountains and depressions (0.41 – 1 ha/capita) with administrative territories where a subsistence farming is practiced with reduced farmland surfaces, in-built and forested areas. To these land features, cleared forests (from intermountain depressions) are added with an unbalanced environment (1.01 – 2.0 ha of agricultural land/capita), but also highly unbalanced plain-located communes (over 2.0 hectares of farmland/capita) where agricultural lands (particularly arable land) cover a large area. Some mountain-located communes of the eastern part of the county have pastures and hayfields spreading over large areas, but do not necessarily indicate a serious unbalance (3.3 ha/capita – 4.2 ha/capita).

In conclusion, the LAUs analysed indicate a population decrement tendency, which translates into lowering the latter's impact in the Nature 2000 protected areas. On the other hand, local actors should be more aware of the importance of nature which they inhabit. However, attention should be drawn to the fact that the local population is not the only economic actor acting in the protected areas (there are also people outside the LAUs analysed and companies interested in logging and tourism planning). Local and institutional actors should be more aware of the importance of the nature they inhabit and administer so that Nature 2000 sites are viable.

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