

THE RURALITY BETWEEN THE RAMNICUL SARAT AND THE BUZAU VALLEYS – DEFINITIVE COMPONENT OF THE SUBCARPATHIAN LANDSCAPES DYNAMICS

Maria PĂTROESCU¹, Mihăiță- Iulian NICULAE¹

¹ Centre for Environmental Research and Impact Studies (CCMESI), University of Bucharest, 1 N. Balcescu Ave., 010041 Bucharest, e-mail: mpatroescu@yahoo.com, iulian_198@yahoo.it

Abstract

Rural space represents a definite element in the structural and functional transformations of Subcarpathian landscapes, analysed through their geodiversity, biodiversity, and cultural patrimony. The present analyse relieves historical and socio-economic land use changes, process, which determined a restructuring of rural landscapes, allowing a classification of environmental critical areas. Elements defining the rurality of the Subcarpathian landscapes between the Ramnicu Sarat and the Buzau valleys were evidenced and characterised in concordance with the new strategic directions of the European Council regarding rural development in 2007 – 2013 period, and with the national legislation in the field, for establishing protection, rehabilitation and valorization strategies for the Subcarpathian rural landscapes. The case study realised in the villages included in the Subcarpathian sector of the Slanic de Buzau valley relieved a spatial and temporal dynamics for the indices of human pressure through different land-uses, allowing the establishment of artificial degrees of rural Subcarpathian landscapes. The data obtained from the CORINE Land Cover model, 1990 and 2006 editions, corroborated with the data rendered in agricultural registers and statistical data from NIS (National Institute of Statistics) relieve spatial dynamics of land-uses in the analysed area, and at the same time, there were identified the areas which induce important modifications in the landscapes structure and functionality.

Keywords: *rurality, geodiversity, biodiversity, human pressure, Subcarpathian landscape, Curvature Subcarpathians, Romania*

Rezumat

Ruralitatea dintre văile Râmnicului Sărat și Buzău- componentă definitivă a dinamicii peisajelor subcarpatice. Spațiul rural reprezintă elementul definitiv al transformării structurale și funcționale a peisajelor subcarpatice, analizate prin prisma geodiversității, biodiversității și patrimoniului lor cultural. Analiza întreprinsă a evidențiat schimbările în timp istoric și socio-economic a modului de utilizare a terenurilor, proces ce a condiționat destructurarea peisajelor rurale și a permis ierarhizarea arealelor critice din punctul de vedere al stării mediului. Au fost evidențiate și caracterizate elementele definitive ale ruralității spațiului subcarpatic dintre Râmnicu Sărat și Buzău, în concordanță cu noile orientări strategice ale Consiliului Europei pentru dezvoltare rurală, specifice perioadei 2007-2013, și legislației naționale în domeniu, în scopul stabilirii politicilor și strategiilor de protejare, reabilitare și valorificare a peisajelor rurale subcarpatice. Studiul de caz realizat în arealul comunelor circumscrise sectorului subcarpatic al văii Slănicului de Buzău a evidențiat dinamica spațio-temporală a indicilor de presiune umană asupra mediului prin diferite moduri de utilizare a terenurilor și a permis stabilirea gradului de artificializare a peisajului rural subcarpatic. Datele obținute din prelucrarea modelului CORINE Land Cover ediția 1990 și 2006, coroborate cu datele existente în registrele agricole și datele statistice furnizate de către INS, evidențiază dinamica spațială a utilizării terenurilor în arealul subcarpatic analizat, permițând în același timp spațializarea arealelor care induc modificări importante în structura și funcționalitatea peisajului rural subcarpatic.

Cuvinte-cheie: *ruralitate, geodiversitate, biodiversitate, presiune antropică, peisaj subcarpatic, Subcarpații de Curbură, România*

INTRODUCTION

The landscape, seen as a materialization of temporal and spatial interactions between natural components and human activities, is considered a projection of geodiversity, biodiversity, and cultural diversity interactions (Patroescu et al., 2000, Toma, 2008), with geodiversity functioning as a support for the other components. The synergic integration

of these components determines the complexity of rural landscapes.

Rural landscape, as an integrated part of the natural material patrimony (CEMAT, 2000) is considered a *complex of interacting factors and whose internalities and externalities offer a special dynamics*, a life frame for the rural population (Patroescu et al., 2000).

Analysing characteristic elements from the rural Subcarpathian landscapes were identified and prioritized three main components, with a major influence on the structure and functionality of landscapes: *the rural settlement, rural population, and the predominant agricultural land use*. The materialization of the landscapes functions and structure in the three components progressively determined characteristics of the rural space, analysed regarding the externalities and internalities of environmental factors.

From a socio-demographical perspective, rural spaces are defined as areas with reduced population and low density values (*Fuguitt, 2005*), the predominance of inhabitants considering themselves “*peasants*” with a rural mode of life, in the villages (*Wolfe and Fischer, 2003*), in spaces with predominant agricultural production (*Madu, 2009*) being strongly connected with urban environments situated in the proximity, and with a strong influence upon the values of rural-urban and urban-rural migratory flows, according to socio-economic and political conditions.

Rural spaces were characterised according the cultural and traditional perspectives, *Madu (2009)* identifying a series of defining aspects: predominant landscapes are open ones, most of the population being associated with the agricultural and forestry sectors, a traditional lifestyle, excessive land-uses, with distinct socio-cultural characteristics and low densities of constructed spaces, etc.

These factors were identified and classified in the rural Subcarpathian space between the Ramnicu Sarat and the Buzau, the analyses allowing the establishment of politics and strategies for the development and management of relationships between rural communities, both at local and regional level, as well as classifying optimal measure for protecting and preserving rural Subcarpathian landscape, therefore maintaining an equilibrium between environmental factors.

Study area

The study area is located in the Curvature Subcarpathians (in Vrancei and Buzaului subdivision) (*Posea and Badea, 1974*), overlapping a relief dominated by the alternance of depressions and hills, from the folded Miocene formations, Pliocene and Villafranchian (in the case of Vrancea Subcarpathians) and Miocene – Pliocene formations of crease fissures in the Buzau Subcarpathians (*Geological map 1:200 000, Ploiesti and Covasna sheets*).

Administratively, it is situated mostly in the Buzau County and Vrancea County, including the

surfaces of 35 villages, and a part from the city of Patarlagele and the village of Sibiciul de Sus (Fig. 1).

The absence of urban poles in the Subcarpathian area between the Ramnicu Sarat and the Buzau, relieves the rural character of the analysed spaces, the nearest urban centre being Patarlagele, established as a city in 2004.

For identifying rurality characteristics in the Subcarpathians between the Ramnicu Sarat and the Buzau, it was realised a study case in the Subcarpathian sector of the Slanic from the Buzau valley, including the villages of Lopătari, Mânzălești, Vintila Vodă, Beceni, and Cernătești, and representing approximately 26% of the total study area.

METHODS AND MATERIALS

A series of indices were selected and analysed function of the rural space characteristics, classified on several domains: *demographical, economic, and social*, with the purpose of evidencing the rural character of the analysed space, a dominant factor in the dynamics of rural Subcarpathian landscape.

In the analyse we used statistical data extracted from *the localities cards*, for the years 1992, 2001, and 2008, obtained from the *National Institute of Statistics, Buzau and Vrancea county divisions*.

The main indicators calculated and evaluated are: *the value of population density*, calculated as a ratio between the total population and the surface of each village (square km); *age groups structure of rural population*, with an analyse on three main categories (under 14 years, 15-59 years, over 60 years); *agricultural density* – a relationship between the rural population and the agricultural surfaces from the analysed territory; *the proportion of agricultural surface from the total surface of the village*, expressed in percents; *proportion of different land uses from the total agricultural surface*, expressed also in percents.

The spatial and temporal dynamic of the rural Subcarpathian landscape was assessed also by evaluating the impact of human pressure upon environmental components and its projection in the artificialization of the landscapes.

A series of *human pressure indices* through different land uses (*agricultural, arable, pastures, grasslands, vineyards, and orchards*) were prioritized and calculated for each territorial administrative unit. The obtained results were then compared with the limits established by *FAO* in maintaining an environmental equilibrium. The values of human pressure indices were obtained by relating the surfaces with different land uses (expressed in hectares) with

the total number of rural population for each territorial administrative unit.

Another method used for analysing the rurality of the space, was the spatial and temporal dynamic of land use and cover (Turner and Mayer, 1994) and its role upon the structure and functions of the rural landscape.

The spatial database realised by the European Environmental Agency in the *Corine Land Cover* project for the years 1990 and 2006 (CLC 1990 and

CLC 2006, data available at <http://www.eea.europa.eu/data-and-maps/data/corine-land-cover-1990-raster> and <http://www.eea.europa.eu/data-and-maps/data/corine-land-cover-2006-raster>), resolution of 100 m, version 13 was used. These were conditioned with the ArcGIS 9.3 software.

In the analyse was used the classification from the CORINE Land Cover model, land use and cover types being grouped into 5 major classes and 15 subclasses (EEA, 1994).

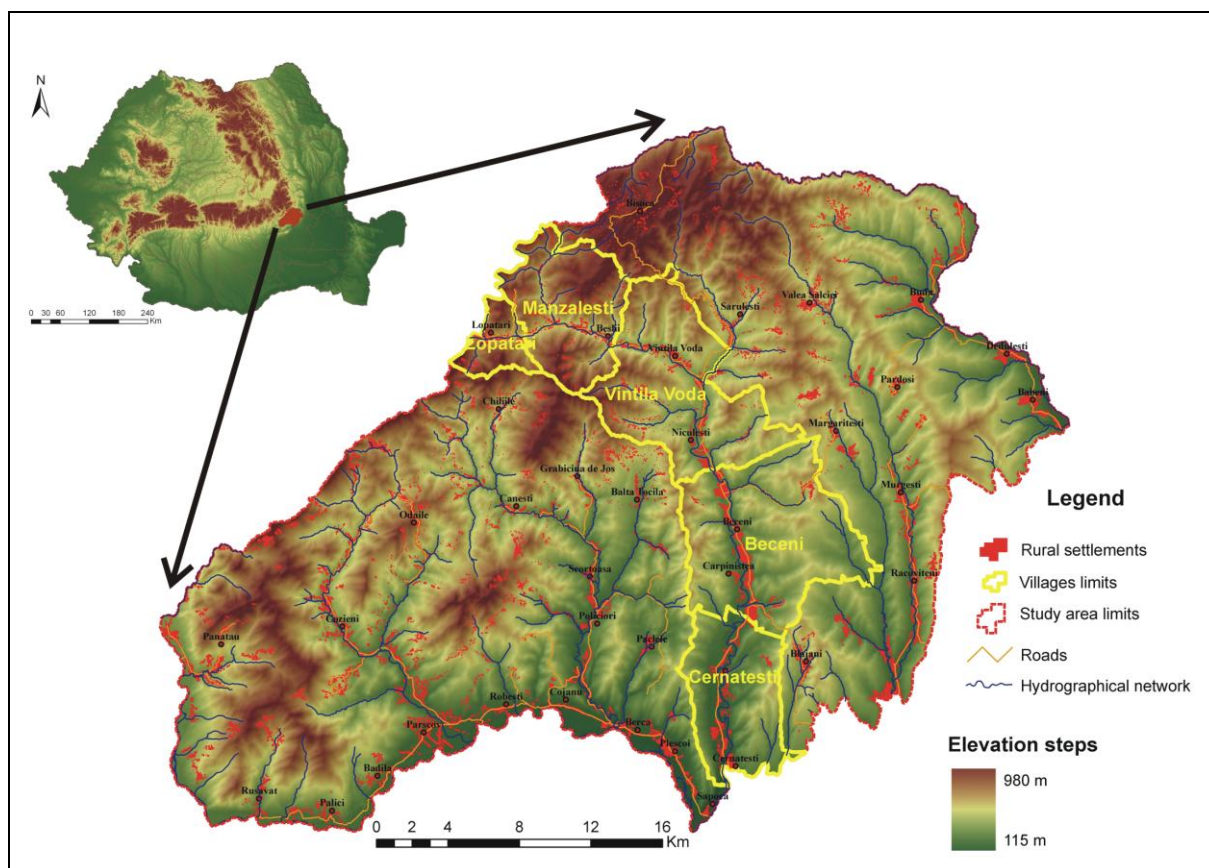


Fig. 1 Location of the study area

For the graphical and cartographical material, land uses were regrouped into 10 classes for 1990 and respectively 9 classes for 2006, adapted to particularities of the analysed space, according to the manifestation of environmental externalities and internalities.

The difference recorded between the two legends of the *Land use and cover maps*, for the year 1990 and 2006, can be explained by the vegetation covering of sand fields, or those affected by erosion, these types being absent in the CLC 2006 database.

RESULTS AND DISCUSSIONS

Values of the population density calculated for the analysed villages record a negative dynamics (Fig. 2), being situated under the value of 150 inhabitants per square kilometre, value considered

by OECD (1996) as the limit for rural settlements in the European Union, the main cause being the low social level, but also the dynamics of the main demographical phenomena: natural balance and migratory flows. An analyse of the demographical potential and the dynamics of rural population is necessary in evidencing their influence upon the agricultural work force.

The decrease of the inhabitants' number from rural environments had a major effect upon the age and sex structure of population. Following analyses for the 5 villages, a high percent was occupied by the population situated in the 15-59 year old group, occupied in the agriculture, and by the population in the over 60 year old group, with a major effect in the ageing process (Fig. 3).

The third indicator, *agricultural density* demonstrates the rurality of the analysed space, and the artificialization of the Subcarpathian rural landscape. The calculation of this index revealed decreases in values in 2008 compared with 1992 for the villages of Lopătari, Mânzălești, and Vintilă Vodă, as a result of the population reduction and agricultural surface increases, while in the case of Beceni and Cernătești the index recorded an insignificantly increase in the year 2008 compared with 1992 (Fig. 4).

The rurality was relieved also by analysing the balance of agricultural surface from the total surface, but also by the balance of different agricultural land-uses from the total agricultural surface.

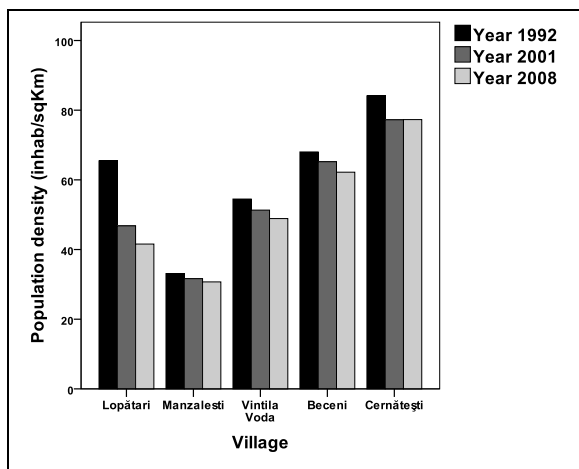


Fig. 2 Population density values in the analysed villages

Evaluating the percent of agricultural surface from the total surface of the villages, a decrease can be observed in 2008, when compared with 1992, with the exception of Vintila Vodă, which recorded an increase from 63.9 % in 1992 to 66.5 % in 2008.

Table 1. Percents of agricultural surfaces from the total surfaces of analysed villages

Territorial administrative units	Lopatari		Manzalesti		Vintila Vodă		Beceni		Cernătești	
	1992	2008	1992	2008	1992	2008	1992	2008	1992	2008
Percent agricultural / Total surface (%)	45.1	35.3	30.2	29.7	63.9	66.5	77.1	68.7	75.8	69

Source: Values obtained based on statistical data supplied by NIS

Among the categories of agricultural uses, in 2008, the largest percent was occupied by pastures and grasslands for the villages Lopătari, Mânzălești, and Vintilă Vodă, situated in the uoer hydrographical watershed of the Slanic, and with geomorphologic conditions improper for crops, the emphasis being on animal growth and wood conditioning.

In the case of Beceni and Cernătești, situated on the lower course of the Slanic, the highest percent

The main cause is the increase of agricultural surface in 2008 with 176 hectares (Table 1).

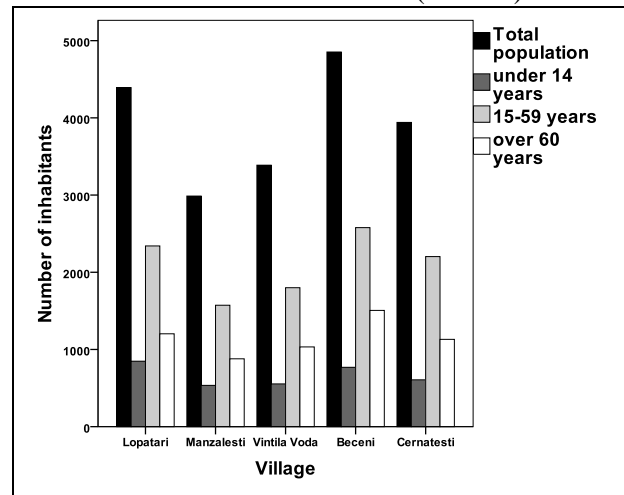


Fig. 3 Population structure by age groups in the analysed villages

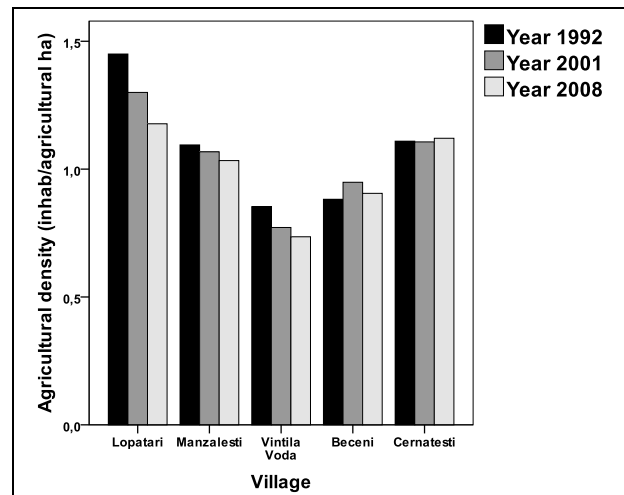


Fig. 4 Agricultural density for the analysed villages

of the agricultural fields is occupied by arable fields and pastures. Here, it can be observed increases in the percents occupied by vineyards (Table 2).

Human pressure through different land uses represents a synthetic indicator of environmental quality and the artificialization of rural landscapes (Dumitrascu, 2006) recording differentiating values in the five villages from the analysed space.

Values of the human pressure indices through different land uses are expressed in Table 3.

Table 2. Percents of different agricultural land uses in the analysed villages

Territorial administrative unit		Lopatari		Manzalesti		Vintila Voda		Beceni		Cernătești	
Index	year	1992	2008	1992	2008	1992	2008	1992	2008	1992	2008
Arable from agricultural (%)		4.8	0.1	4.5	10.1	18.7	17	27.8	33.5	30.8	38.6
Pastures from agricultural (%)		34.6	34.8	38.5	31.3	48.9	47	50	38.5	52.4	44.8
Grasslands from agricultural (%)		50.6	57.1	54.5	52	27.8	31.9	14.7	19.1	4.3	4.1
Vineyards from agricultural (%)		0	0	0.1	0	0.8	0.5	2.4	2.7	9.1	8.7
Orchards from agricultural (%)		9.9	7.9	2.4	6.6	3.9	3.4	5.1	6.2	3.4	3.8

Source: Values obtained based on statistical data supplied by NIS

By comparing the values of human pressure through arable with the *0.4 ha/inhabitant* value considered by FAO as a maximum limit (*Geografia României, vol.I, Geografie fizică, 1983*) for maintaining an equilibrium between

environmental components, it can be observed that arable land use is reduced in Lopatari, situated mostly in a mountainous area, with a strongly fragmented surfaces (Fig. 5).

Table 3. Dynamics of human pressure through different land uses indices

Territorial administrative units	Year	Inhabitants' number	Agricultural	Arable	Pastures	Grasslands	Vineyards	Orchards
Lopătari	1992	5,174	0.6896	0.0334	0.2387	0.3492	0	0.0682
	2001	4,836	0.7692	0.0010	0.2616	0.4456	0.0010	0.0600
	2008	4,193	0.8702	0.0012	0.3034	0.4968	0	0.0689
Manzalesti	1992	3,135	0.9136	0.0411	0.3518	0.4976	0.0006	0.0223
	2001	2,997	0.9366	0.0944	0.2906	0.4885	0.0007	0.0624
	2008	2,881	0.9770	0.0982	0.3054	0.5085	0	0.0649
Vintila Voda	1992	3,651	1.1720	0.2191	0.5730	0.3254	0.0090	0.0455
	2001	3,439	1.2957	0.2207	0.6098	0.4138	0.0070	0.0445
	2008	3,203	1.3908	0.2363	0.6544	0.4449	0.0074	0.0478
Beceni	1992	5,213	1.1337	0.3148	0.5670	0.1671	0.0267	0.0581
	2001	4,999	1.0542	0.3397	0.3997	0.2026	0.0336	0.0786
	2008	4,652	1.1322	0.3792	0.4364	0.2160	0.0307	0.0698
Cernătești	1992	4,252	0.9015	0.2778	0.4727	0.0383	0.0823	0.0303
	2001	3,905	0.9037	0.3467	0.3997	0.0369	0.0860	0.0343
	2008	3,890	0.8964	0.3465	0.4013	0.0370	0.0776	0.0339

Source: Values obtained based on statistical data supplied by NIS

Values near the limit imposed by FAO are recorded for Vintilă Vodă, Beceni, and Cernătești, where arable fields occupy a large percent from the total agricultural surface.

In the case of Mânzălești, values of the human pressure through arable index record an increase in 2008, when compared with the other years, from 0.0411 ha/inhab. to 0.0982, it followed an increase of arable surfaces in the disadvantage of other land uses.

Human pressure through pastures records high values in Vintilă Vodă, Beceni, and Cernătești, with increases in 2008 compared with 1992 in the case of

Vintilă Vodă, and decreases in values for Beceni and Cernătești.

Analysing *human pressure through grasslands*, there are recorded increases in 2008 compared with 1992 in all the villages except Cernătești where the values record a slight decrease, evidencing the specific of agricultural use with valances resembling rural spaces from the contact with plain units.

Human pressure through vineyards relieves the contrast of agricultural use in the five villages in relation with the specific of surrounding relief units. The highest values for this index are recorded in Cernătești.

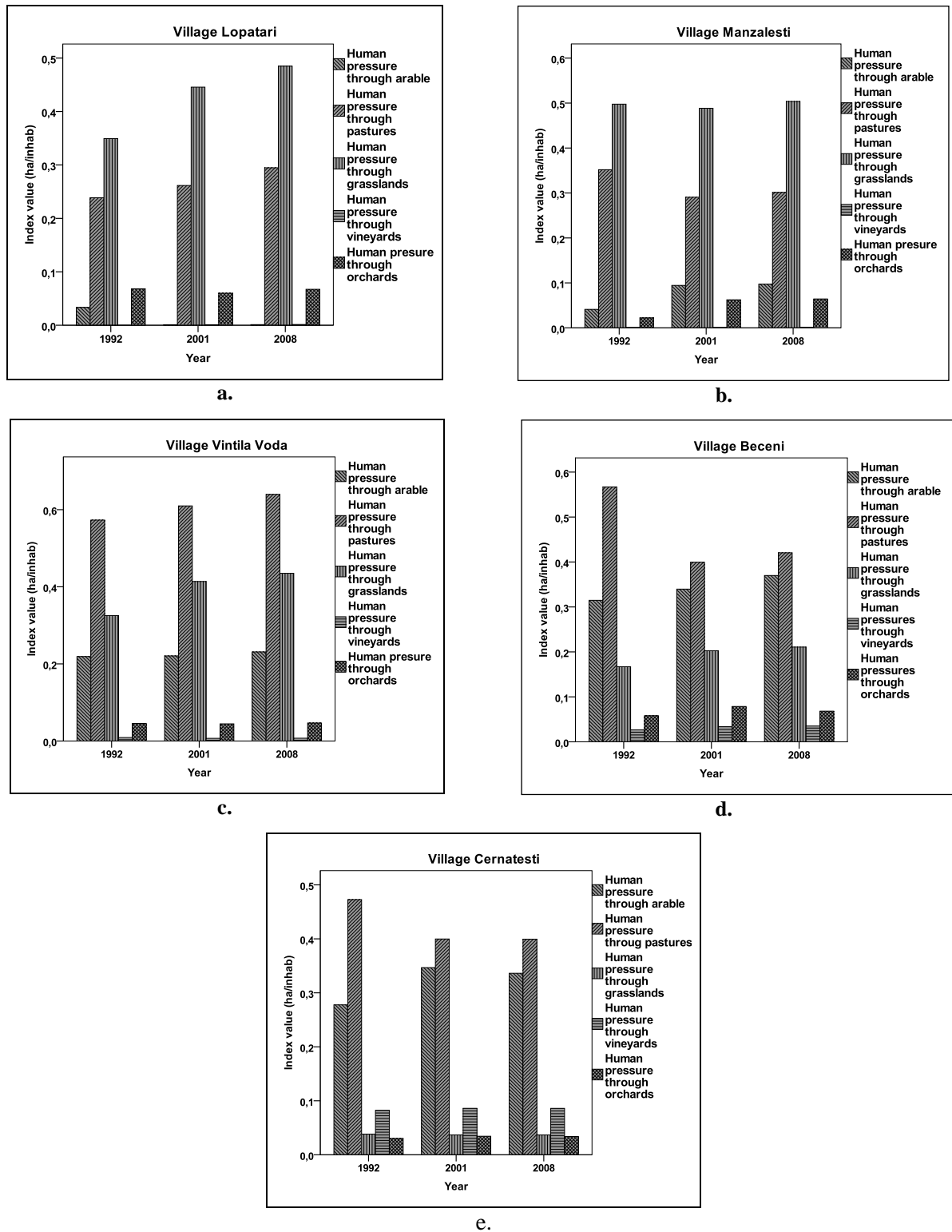


Fig. 5 Human pressure through different land uses (a, b, c, d, e)

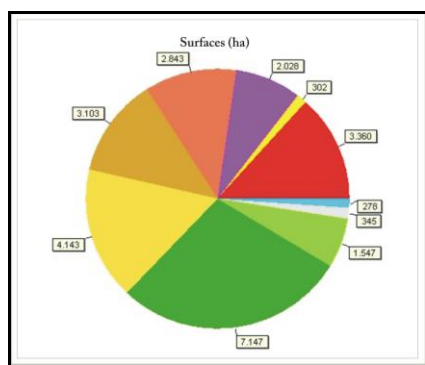
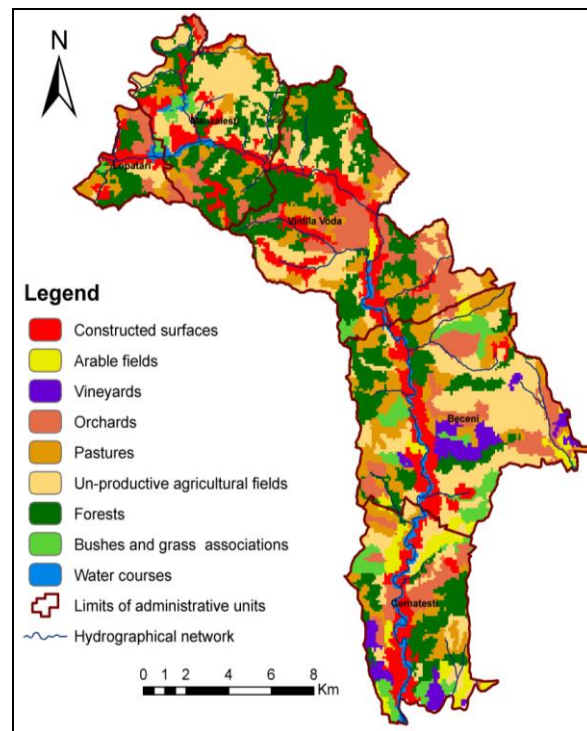
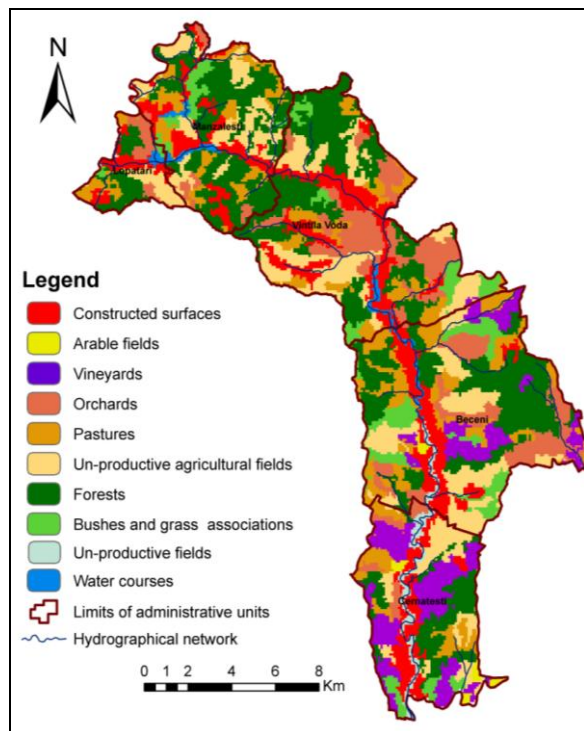
Values of the *human pressure through orchards index* record an ascendant trend in 2008 compared with 1992 for all villages, thus existing preoccupations for the expansion and revitalisation of orchards.

Analysing and representing graphically data resulted from CLC 1990 and 2006 models, there were evidenced changes in the structure of the land use for each analysed village, in a comparison between 2006 and 1990 (Fig. 6), under the pressure of rural

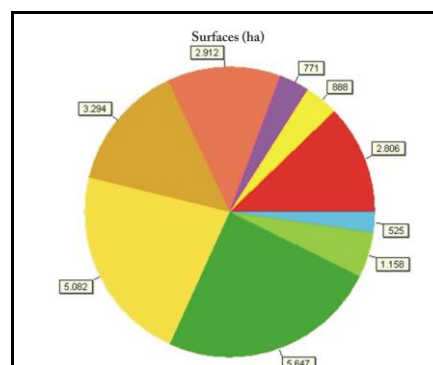
population, and the necessity of satisfying their human needs.

Between the two maps, there are recorded increases in 2006 compared with 1990 for *arable fields, surfaces occupied by orchards and tree nurseries, pastures and un-productive agricultural fields.*

These increases are realised in the disadvantage of the other land uses and coverings, specific to the analysed area, which suffered obvious decreases: *vineyards, forestry surfaces, bushes and grass associations, constructed surfaces.*



A.



B.

Fig 6 Land use and cover in 1990 (A) and 2006 (B), in the analysed villages

CONCLUSIONS

On the surfaces of the 5 villages, there are encountered particularities of the rural Subcarpathian space, characterised through a dominance of settlements with rural functions, structure and aesthetics, a predominant agricultural land-use and dominant agricultural population.

The spatial and temporal dynamics of the values for human pressure indices upon the biotic components reveals changes from the socio-historical times upon land uses, conditioning in

the same time the restructuring of rural landscapes from the Subcarpathian area.

From the calculated values for the five villages, it can be observed a clear differentiation regarding human pressure on the environment, related with geodiversity, major relief type, the dynamics of inhabitants numbers – in a continuous decrease, but also according to climatic changes recorded at local, regional and global level.

Regarding the arable land use, factors influencing the temporal dynamic of the human pressure through arable index are especially the decrease of rural population, but also increases and decreases of arable

surfaces, corroborated with particularities of the lithological substratum, relief fragmentation degree and soil erosion.

The analysis realised based on the data extracted from the CORINE Land Cover model, for the years 1990 and 2006, evidenced a real expansion of arable surfaces and pastures, in the disadvantage of forest and vineyards, the main cause being the need of expanding pasture fields and the arable use of fields, increasing the functional heterogeneity degree of the rural Subcarpathian landscape and its fragmentation.

Values obtained from the statistical data regarding the proportion of different land uses from total agricultural surface, corroborated with values of human pressure through different land uses indices, calculated for each territorial administrative unit are verifiable by the CORINE Land Cover model. The differences are determined only by the interpretation and classification methodology of different land uses and covers developed by the European Environmental Agency.

REFERENCES

- EEA, (1994), *CORINE Land cover- Part 1: Methodology*, disponibil la adresa <http://www.eea.europa.eu/publications/COR0-part1>.
- Fuguitt, G., V., (2004), *Some demographic aspects of rurality*, Research in Social Stratification and mobility, vol. 22, Elsevier.
- Gillson, L., (2009), *Landscapes in Time and Space*, in Landscape Ecol 24:149-155, Springer.
- Hirschhausen von., Beatrice, (1997), *Les nouvelles campagnes roumaines. Paradoxes d'un "retour" paysan*, Mapamonde, Edition BELIN, Paris.
- Kayser, B., (1990), *La renaissance rurale*, Ed. Armand Colin, Paris.
- Liang, L., Schwartz, M., D., (2009), *Landscape phenology: an integrative approach to seasonal vegetation dynamics*, in Landscape Ecol 24:465-472, Springer.
- Madu, A., I., (2009), *The structure and pattern of rurality in Nigeria*, GeoJournal, DOI 10.1007/s10708-009-9282-9.
- Pătroescu, M., (1996), *Subcarpații dintre Râmnicu Sărat și Buzău. Potențial ecologic și exploatare biologică*, Editura CARRO.
- Pătroescu, M., Toma, S., Cenac- Mehedinți, M., Rozyłowicz, L., (2000), *Ierarhizarea peisajelor rurale din Câmpia Română funcție de vulnerabilitatea la degradare și suportabilitate a presiunii umane*, Geographica Timisiensis, Timișoara.
- Posea, Gr., Badea, L., (1984), *Republica Socialistă România. Unitățile de relief. Regionarea geomorfologică*, Editura Științifică și Enciclopedică.
- Toma, S., (2008), *Dinamica structurilor agrare și proiecția lor în ecologia peisajelor rurale din Câmpia Română*, Teza de doctorat.
- Turner, II, B., L., Meyer, W., B., (1994), *Global Land-Use and Land-Cover Change: An Overview, in Changes in Land Use and Land Cover: A Global Perspective*, (W.B. Mezer and B. L. Turner II), Cambridge University Press, 1994.
- Wolfe, R., J., Fischer, V., (2003), *Methods for Rural / Non-Rural Determinations for Federal Subsistence Management in Alaska. Summary Report. Analysis and Recommended Methodology*, Anchorage, AK: Institute of Social and Economic Research.
- *** (2003), *European Rural Heritage. Observation Guide*. CEMAT, Council of Europe.