

RURAL LANDSCAPES AND HUMAN PRESSURE IN THE SUBCARPATHIAN DEPRESSIONS OF OLTENIA. GEOGRAPHICAL CONSIDERATIONS

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Rural landscapes and human pressure in the Subcarpathian depressions of Oltenia. Geographical considerations. The rural landscape has been moderately changed by human intervention in the natural space. The country-side has the capacity to preserve and reconstruct the natural landscape because human pressure is less severe than in the urban area. What has an impact on the former is the concentration and dispersion of population and of land, as well as other economic activities that affect the environment. In order to single out the types of rural landscape, our analysis has focused on the distinct territorial traits of villages and village hearths, population dynamics land-use practices, and anthropogenic grade. The present case-study looks at the structure and territorial distribution of rural landscape types in the Subcarpathian depressions of Oltenia and man's overuse of the natural background.

INTRODUCTION

Human pressure in the rural area designates the environmental impact of man's permanent activity in using the area's physical-geographical components, basically nature itself, to his own advantage.

The rural landscape is man's "true masterpiece", the territorial projection of his continuous pressure to model nature in order to satisfy one's own needs.

The country-side, where human pressure is less severe than in town, is capable of preserving and reconstructing the natural background in terms of land-use type and the general level of production forces. Characteristic of the Subcarpathian depressions of Oltenia are the vast expanses of hay-fields, the herds of animals, reduced density of major communication roads and smaller buildings.

Human pressure is visible in the concentration and dissemination of population and settlements, land use and environmentally unfriendly economic activities. The distribution and structure of settlements reflect the close relationships between man and landscape geometry.

The present paper discusses the man-environment impact in two ways: on the one hand, there is pressure on the environment and the territorial manifestations and differentiations that engender distinct rural landscapes and of types. On the other hand, growing pressure on the environment may lead to landscape degradation, which in case of natural disasters – floods, landslides, augmented by abusive human action (deforested slopes, improper land use, the building of economic units in risk-prone areas, etc.), represents a risk for households, crops and the environment as a whole. Human pressure has been assessed by means of classical geographical methods, basically, land-use cartographic analysis, as well as modern statistical analysis methods – main indicators: population density and dynamics, density, structure and texture of human settlements, and the index of naturalness.

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HUMAN PRESSURE AND THE RURAL LANDSCAPES

The quality of rural landscapes is perceived and assessed in terms of their natural and human elements. In time, man has been changing the natural elements and their functional attributes by building settlements, routes of communication, cultivating the land, etc. The structure and territorial distribution of rural landscapes in the depressions of Oltenia are the result of intense human pressure. The pregnant rural character of these depressions is seen in the network of permanent settlements (64 villages and only 3 towns) extending on 1,434 km², that is, on 13% of the administrative territory of Gorj and Vâlcea counties they belong to.

The rural landscape shows significant spatial and temporal differences in the lay-out of households within the village hearth and its social-economic development.

At present, the Subcarpathian sector between the rivers Jiu and Bistrița Vâlcii is less densely populated (42 inh./km², on average and even under 30 inh./km² at the contact with the mountains, but 70-100 inh./km² in the Subcarpathian Hills of the south, and alongside the valleys), this indicator signifying *moderate human pressure* (Table 1).

The grouping of settlements by number of inhabitants indicates the presence of *small and very small scattered villages* (100-500 inh. and under 100 inh., respectively) in the Jiu-Ciocadia, or Bistrița-Luncavăț interfluves; *medium-sized villages* (500–2,000 inh.), widely spread in the Subcarpathian depressions of Oltenia, occur mostly alongside the Bistrița, Cerna Oltețului, Blahnița and other valleys; *large villages* (over 2,000 inh.) are situated in the eastern half of the Depression Corridor, alongside the Olteț and the Luncavăț valleys (Baia de Fier, Polovragi and Vaideeni).

Table 1

Density of population and settlements

Settlement	Population 2010	Total area (km ²)	Population density (km ²)	Village number	Settlement density (100 km ²)
Baia de Fier	4,193	120.2	34.9	2	2
Bumbești-Jiu	10,360	214	48.4	4	2
Bumbești-Pițic	2,256	36.7	61.5	3	8
Costești	3,339	109.2	30.6	4	4
Crasna	5,092	209	24.4	9	4
Horezu	6,661	117.6	56.6	6	6
Măldărești	1,991	28.7	69.4	4	14
Mușetești	2,083	91.8	22.7	7	8
Novaci	5,943	174.8	34.0	4	3
Polovragi	2,914	84.9	34.2	2	2
Slătioara	3,482	48.1	72.4	6	12
Tomșani	3,919	41.1	95.3	8	19
Vaideeni	4,029	157.5	25.6	5	3
Total	56,262	1,434.35	39.2	64	5

Source: processed from the National Institute of Statistics data, 2010.

A special place is held by the few towns (Bumbești-Jiu, Novaci and Horezu) localised along the main valleys (Jiu, Gilort and Luncavăț). They are small-sized in terms of population, economy (agro-tourism) and housing stock, consonating with the rural landscapes.

A comparison between average settlement density (5 localities/100 km²) and the whole Subcarpathian space and limitrophe piedmont region (12 localities/100 km²), where natural conditions (especially in depressions) are more favourable to the development of medium-sized villages than of

very scattered ones (under 100 inh. /100 km²) indicates that the former fall into the moderate human pressure class.

Man puts pressure also on land use. The complex changes registered in the last 20th-century decades and the beginning of the 21st century have not modified essentially land-use structure and types. In the study-region, 57% is forest land, 29% pastures and hay-fields, little arable land (7%), orchards (2.6%), vine-yards (1.4%), and other lands (3%). In terms of land-use structure (Table 2) and naturalness index (Fig. 1), that is, afforested area / per total area in Oltenia's depressions, three landscape groups can be distinguished: strongly anthropogenic, moderately anthropogenic and weakly anthropogenic.

Strongly anthropogenic landscapes correspond to those geographical areas in which the ecological balance has been severely disturbed (e.g., the limestone quarries at Bistrița).

These landscapes are seen mostly in the south of the region, on the territory of Bumbești-Pițic, Slătioara, Măldărești and Tomșani communes, but also in some industrial towns and settlements with a better developed access infrastructure. The natural vegetation of these landscapes has in time been replaced by agricultural land and only here and there is the forest still in place. Land use also influences the type of rural landscape and the human pressure exerted on it. Strongly anthropogenic landscapes have the natural vegetation changed (transition from natural forest to man-made crop fields and from natural pastures (fallow) to cropland. This landscape is characteristic of the contact area between hillsides and lowland, where more arable land is communal ownership.

Population density: over 80–100 inh. km², settlement density: above the region's average of 6–9/100 km². Physiological density, that is, rural population ratio per private agricultural area, indicates 300 inh./100 ha agricultural land, which means high human pressure on arable land because the proportion of arable-to-hay-fields or pastures, forests or orchards/vine-yards is reduced. These landscapes are at risk since ecosystems have grown extremely artificial through excessive consumption of resources, the consequences being detrimental for nature and society alike. Possible ecological imbalances can hardly be corrected.

Table 2

Land-use structure

Locality	Total surface (ha)	Forestry (%)	Farm land (%) of which:	Arable land (%)	Vine-yards (%)	Orchards %	Pastures and hay-fields (%)	Other lands (%)
Baia de Fier	12,025	59	37	6	0.2	0.4	31	4
Bumbești-Jiu	21,402	72	20	5	0.6	1.2	13	7
Bumbești-Pițic	3,679	14	81	14	0.7	5.1	61	6
Costești	10,921	78	20	4	0.0	2.0	14	2
Crasna	20,908	54	41	7	0.5	1.1	32	6
Horezu	11,769	60	34	4	0.0	3.4	27	6
Măldărești	2,873	26	66	16	0.0	6.0	44	8
Mușetești	9,189	66	31	12	1.0	1.7	17	3
Novaci	17,485	58	38	6	0.3	0.6	31	4
Polovragi	8,495	58	38	11	0.3	0.7	27	4
Slătioara	4,814	20	71	16	0.0	1.2	54	8
Tomșani	4,117	27	64	17	0.0	8.3	39	8
Vaideeni	15,759	45	52	2	0.0	4.1	46	3
Total	143,436	56	39	7	0.3	2.0	29	5

Source: processed from the National Institute of Statistics data, 2010.

Moderately anthropogenic landscapes – the ecological balance of these landscapes, which cover most of the study-region, including the communes of Vaideeni, Polovragi, Baia de Fier, Crasna and Novaci Town, is little disturbed. Here, one finds a wide range of land uses, of forests alternating with meadows turned into hay-fields, grazes and orchards, often interspersed among agricultural terrains.

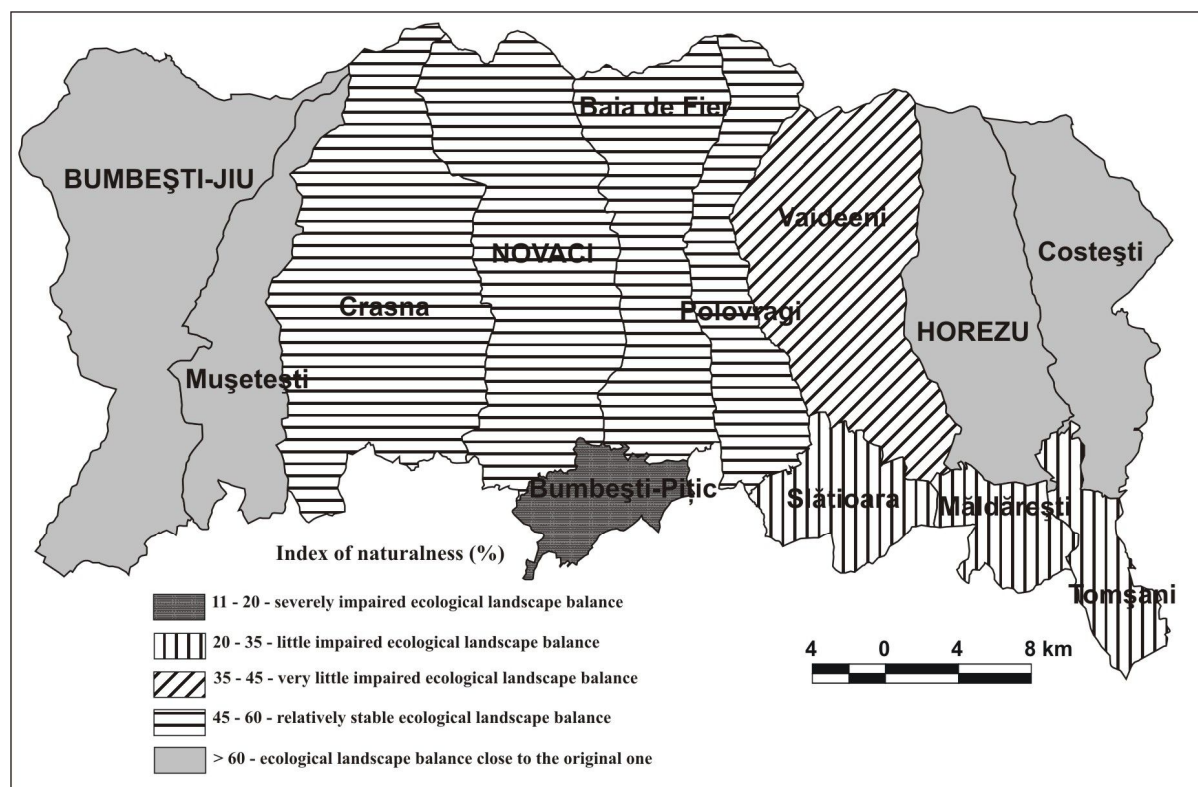


Fig. 1 – Index of naturalness in the Subcarpathian depressions of Oltenia.

Certain areas (south-east sheltered slopes with fertile soil) are covered mostly by orchards, vast pasture-lands and hay-fields (500–700 m alt.). Specific landscapes: *compact pomicolous and agro-pastoral in the hills*, both subjected to *moderate human pressure*, interspersed with natural and man-altered hay-fields (pastures instead of forests, or orchards instead of hayfields).

Medium-sized settlements prevail (500–1,000 inh.), agricultural land is under 40%/settlement, settlement density up to 4/100 km²; the population density (30–40 inh./km²) at Crasna, Polovragi and Vaideeni is below the region's average value (Fig. 2).

The ecological balance of *weakly anthropogenic landscapes* found in the eastern and western extremities of the region, tends to stabilise and approach the original value. Their territory encompasses Costești and Mușetești communes, much extended towards the mountain area, as well as the rural settlements under the administration of Horezu and Bumbesti-Jiu towns. The forest ecosystem of the study-area is widespread, and consists mainly of *mixed forests*, and *foliated forests*, but afforested and regenerated areas exist as well. *The forest landscape* falls into the category of rural landscapes little affected by human pressure (Naturalness Index 50%). Man's actions have materialised in forestry works, wood collection and processing sites (forestry roads and railways along the Bistrița Vâlcii, Olteț and Gilort valleys) and industrial wood processing centres. There are fewer settlements than in the other landscapes and areas, population numbers being low, too.

The village hearth pattern (*structure and texture*) reflects the type of built-in area (mostly residential) and of the dominant economic activity, both having contributed to village grouping. Thus, two rural landscape types can be distinguished: 1) *linear villages* with an elongated hearth, corresponding to the form of the respective valley or depression; they have a large population and numerous households, therefore, *great pressure on the landscape*; 2) *polygonal villages*, with an unevenly-shaped hearth, scattered households, and *moderate human pressure* (Fig. 3).

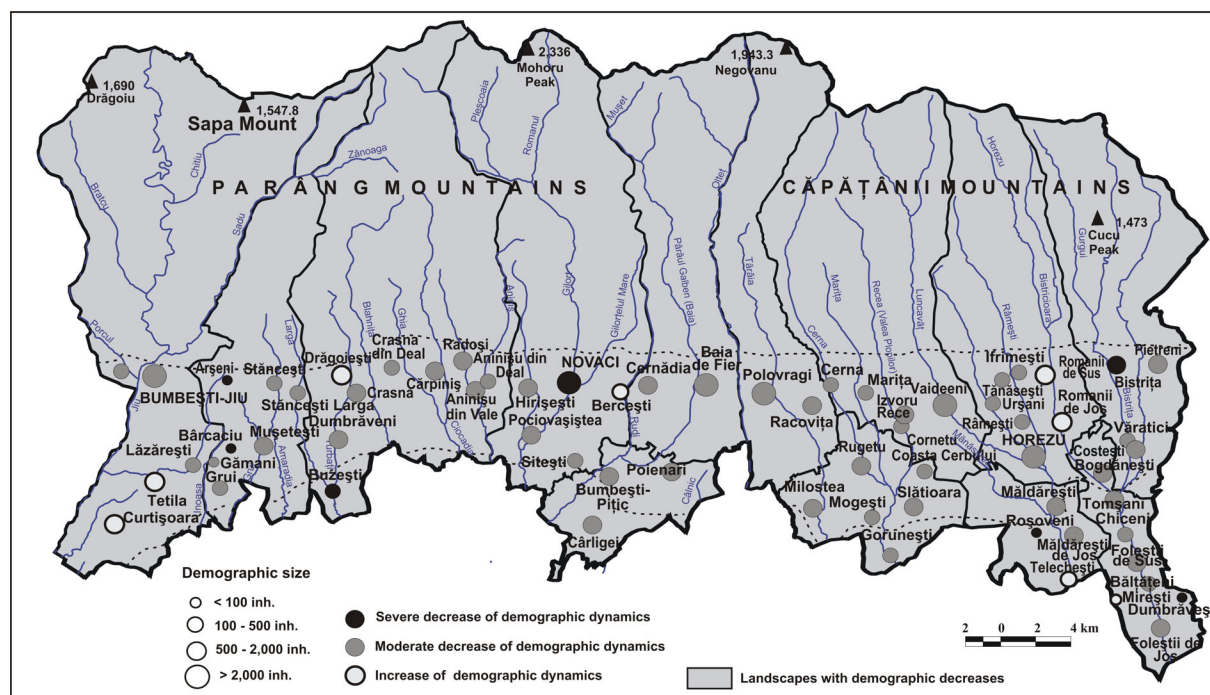


Fig. 2 – Demographic landscapes and 1992-2002 population dynamics.

The linear village often mirrors local relief conditions and building habits, dwelling-houses on stretching the roadside. Initially independently located, the villages would in time come nearer one another, forming a bigger settlement. This village type is characteristic of contact areas, extending 10 km along communication axes, or narrow valleys (Bumbesti-Jiu, Tetila and Curtișoara situated on the left handside of the Jiu River). Most village hearths have a north-south direction (Tănăsești, Gura Râului, Urșani, Râmăsești, Cornetu, Romanii de Sus, Grui and Larga, fewer ones lie east-westwards (Slătioara, Racovița and Cernădă).

Villages with scattered households are specific to the hillside. They are the most common and widespread Subcarpathian rural settlement, and have a wide, irregular pattern. Houses are almost always built on the roadside, forming kind of clusters. Part of the land owned by each household lies around the house (the yard and the garden, some of it being cultivated with vegetables); the other part is outside the village (used for planting cereal crops, or as hay-fields).

DEGRADED RURAL LANDSCAPES

The degradation of rural landscapes in the studied Subcarpathian area goes hand in hand with settlement increased vulnerability to natural hazards, the consequence of overusing natural resources (deforested slopes, slopes turned into arable land, and excessive grazing).

In view of it, geomorphological relief modelling processes (landslides, gully and sheet erosion) kept extending, while natural hazards (floods and gullying intensified, destroying households, routes of communication, terrains, briefly, the environment as a whole). The settlements most likely at risk are those situated on unstable slopes, on floodplain terraces, or low alluvial cones. Also vast pasture lands are degraded by sheet erosion associated with gullying.

The landslide impact on the settlements of Oltenia's depressions is the outcome of large deforestations made over the past few decades. In 2005, the region's forested areas shrank by some 14% compared to 1995, most tree-cuttings having been registered in the communes of Bumbesti-Pițic

(2,900 ha), Crasna (1,400 ha) and the forest stock of Horezu and Novaci towns (1,650 ha and 1,400 ha, respectively). After 1990, each commune's forest area decreased through abusive logging.

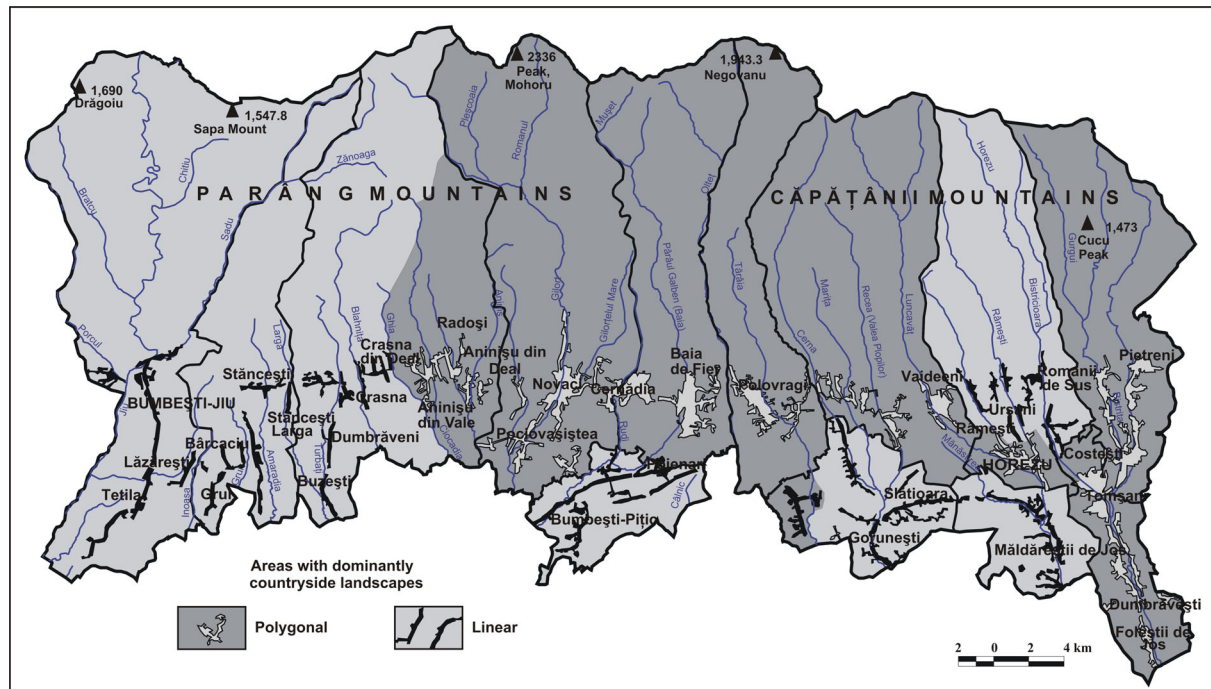


Fig. 3 – Rural landscapes. Shape of village hearth.

Deforestations have affected especially the small village households (Stăncești-Larga, Poienari, and Cernădia) situated in catchment basins (Amaradia, Larga, and Pârâul Galben) with unstable deforested slopes. Landslides impaired also many local roads, especially the unpaved ones. A typical example, confirmed by the locals, is the event of spring 2008, when the local road in Cernădia Village, Baia de Fier Commune, Gorj Subcarpathians, was ready to collapse after land began sliding down. About 10 metres of the banks that sustained the sloping road collapsed, and a several metre-deep scarp formed on the roadside. The event triggered older landslides, reactivated in the rainy season, endangering the road and many village areas.

In the Vâlcea Subcarpathian sector landslides occurred mostly on steep deforested slopes, damaging parts of the settlements of Pietreni, Tomșani (332 ha deforested land and 80 ha impaired in 2006), Măldărești (219 ha deforested land and 200 ha impaired).

Some economic units, or water management units, built on improper sites, are prone to landsliding. As early as 1985, on the initiative of Râmnicu Vâlcea mining company, a canal built to divert the course of the Pietreni River dislodged the Bistrița limestone quarry which obturated the river. The new course joined the Valea Morii Brook enhancing flooding risks. After the year 2000, floods accelerated soil erosion, while landslide risks over the past few years have become ever greater for the local communities of Pietreni Village, the general school and 12 households standing at imminent risk of collapsing.

The impact of floods on rural landscapes – heavy rainfalls with severe environmental impact occur usually in the warm period of the year (May-October), triggering flash-floods and reactivating landslides that endanger settlements, routes of communication, occasionally destroying also electrical lines.

The main cause of flooding and landsliding in the study-area is severe forest clearing. As a matter of fact, both risk phenomena are closely connected. Other causes: settlement building in

improper zones (overflowed floodplain areas), insufficient works to protect settlements, roads and other socio-economic units against natural disasters.

The study-region was facing greater flooding risk, especially in 2002, 2005 and 2007.

Thus, in July and August 2002, heaving rains fell over half the Romanian territory. In the hillside villages of Gorj and Vâlcea counties, households, social-economic units, scores of cropped hectares on the village commons, as well as the transport network were severely damaged.

The floods of October 2007 caused great destructions in Costești, Tomșani and Vaideeni communes and Horezu Town (Vâlcea County), as well as Baia de Fier, Polovragi, Bumbești-Pițic and Crasna (Gorj County). Highest quantities of precipitation fell at Horezu (77.5 l/m²), Cerna (63.4 l/m²) and Vaideeni (63.0 l/m²).

However, it is flash-floods that have the most dramatic effects. Coming at great speed, with a huge erosion and transport capacity, they cause severe damage to both river ecosystem and socio-economic life; the population who witnesses houses flown downstream, bridges and highways overflowed, crops disappearing in the deep, get the apocalyptic image of a devastating deluge.

At Horezu, the flood events of 2007 affected the drinking-water supply system; in Romanii de Sus Village three households were dislodged and carried downstream by the waters of the Bistricioara Brook; several people had to be evacuated; in Săliște and Bivolărie hamlets, two bridges became dysfunctional; the access road to several trading companies was overflowed; the bank of the Luncavăț River was eroded, shaking the foundation structure of three buildings owned by some trading companies. In Urșani Village – Rudari Hamlet, the country road being deteriorated, access became very difficult. The eroded left bank of the Luncavăț put in jeopardy the Horezu Town water purification station.

The waters affected also the infrastructure of communal roads (DC 143 Horezu–Olari–Tănăsești) and county roads (DJ 665 Polovragi–Vaideeni–Horezu; DJ 646 A Stoenesti–Pietreni–Costești). In Costești Commune, a bridge over the Bistrița River (in the homonymous village) and other 7 foot-bridges were destroyed; in Costești Village, 6 households and 12 hectares of arable land were flooded, and the bridge across the Bistrița River was severely damaged. The same fate had 5 foot-bridges (Tomșani Commune) connecting 41 households in Chiceni, Băltățeni, Foleștii de Sus villages and Boereasca Hamlet; the drinking-water network (Valea Plopilor and Luncavăț surface catchment sources) of Vaideeni Village was also affected.

Summing up, we would say that the rural landscapes in the Subcarpathian depressions of Oltenia are subjected to moderate human pressure on the natural environment. Landscape differences depend on territorial organisation, concentration and dispersion of population and households within the general village pattern. Land use is a major element that shapes country-side landscape typology. Landscape diversity can be viewed as complex rural evolution within a geographical space benefitting from a wide variety of natural elements. Landscapes have in time been degraded by ever greater human pressure that has disturbed the balance of component environmental elements, hence instability, erosional processes, landslides and floods. Since rural landscapes mirror a specific way of life, expressed by man/environment relationships, they ought to be maintained and protected by adequate management practices.

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