

Soils – forest – environment in the forest district Moldova Nouă – Caraș Severin county

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Abstract: Forests are one of the most important terrestrial ecosystems. Anthropogenic assault on forests was intensified with the population increase and requirements for agricultural products.

Humanity began to understand the true importance of the forest that it produces much more than wood, berries and game. Forests were grouped as follows: forest responsible for water protection, forest responsible for the soil protection, protective forests for climate change, forests used as recreational, forests of scientific interest. In 2000-2008 Moldova Noua Forest District have been 43 fires that have affected surfaces of more than 50ha and were manifested in the litter area. Destroying the forest we destroy the environment, meaning soil, water and air. The studied is in southern Banat, leaning on the Danube and belongs Locva Mountains, but also includes small depression Sichevita-Liubcova makes the transition to Almaj Mountains.

The soils study revealed the predominance of types belong to Cambisols class, represented by Eutric Cambisols and Dystric Cambisols, with subtypes eutric, dystric and lepti-eutric. Lower productivity is primarily caused by the presence of leptic subtype which lends short soil profile, thinner than 50 cm.

The consequences of economic interests and poor legislation are gravely for the climate, water, soil, transportation and biodiversity.

Keywords: Cambisol, Luvisol, forest, environment protection, cutting, afforestation

1. INTRODUCTION

The total area of Caraș-Severin is 851 976 ha, of which forest occupies 386 096 hectares, or 45.32% of the county [2], which means the second place in Romania. Forests are one of the most important terrestrial ecosystems. Anthropogenic assault on forests was intensified with the population increase and requirements for agricultural products.

Deforestation has been practiced since antiquity. Thus, during the Roman conquest, strategic roads constructed by them in Dacia, from Berzobis (Berzovia) at Azizi (Fârliug) and then Caput Bubali (Valeadenii) passed through the lands covered by forests. "Trajan's Column" of Rome illustrates eloquently forest ornament of these lands [1].

Gradually, humanity began to understand the true importance of the forest that it produces much more than wood, berries and game [4].

In this regard, in each Forest District it was set up a

monitoring system so that now (since 1992) of forests were assigned the following functions

- production and protection (about 60% of forests);
- protection and production (30% of forests);
- absolute protection (about 10% of forests).

Based on studies developed by the researchers, in the Caraș-Severin county of were established three national parks: Domogled - Cerna Valley, Semenic – Cheile Carașului and Cheile Nerei – Beușnița.

By Law No. 5/2000 was founded Iron Gates Natural Park, where economic activity is conducted in harmony with nature.

To protect the environment (soil, water, air, biodiversity) and the maintenance of economic benefits, forests were grouped as follows [12]:

- First group. Forest responsible for water protection
 - forest in the water resources perimeters;
 - forests on the slopes of the storage basin;
 - upstream forests (15-30 km) from the accumulation limit
 - forests in the major course.
- Second group. Forest responsible for the soil protection
 - forests on the Lithic and eroded soils;
 - forests in the transport area routes;
 - forests in the alpine interstices limits;
 - forest plantations on degraded lands;
 - forest on the earth flow.
- Third group. Protective forests for climate change.
- Fourth group. Forests used as recreational
 - forests park;
 - forests located in the vicinity and in the perimeter of settlements;
 - forests around spas, camps, hotels, chalets, with an area of more than 50ha;
 - forests of hunting interest.
- Fifth group. Forests of scientific interest
 - scientific reserve for conservation of genetic fond;

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- experimental forest land forestry

In spite of existing legislation, the standing crop suffered much damage by felling forests over the possibilities of recovery, sometimes even cuts out „laughing" (appropriation, corruption) or by triggering the dry periods of forest fires.

The area of forest districts Moldova Nouă and Berzasca [3] in 2000-2008 there have been 43 fires that have affected surfaces of more than 50ha and were manifested in the litter area. The main cause of fire outbreak represented open, accidental or uncontrolled fires.

Wood and non-wood production should be based on potential forest sites, as this way not to exceed the current growth index (6.3 m³ / ha / year) [11].

„ An excessive consumption of current generation set for itself would involve consumption for future generations "[4].

Destroying the forest we destroy the environment, meaning soil, water and air. Forest exert favorable influence by involving extremes of temperature, wind speed reduction, increasing humidity, ensure balance and life of organisms.

2. MATERIALS AND METHODS

This paper is based by soil monitoring studies conducted during the years 2000 - 2016 under the European Programme and cadastral surveys of the territory of Moldova Noua, conducted by OSPA Timisoara, directed and receive by Gh. Rogobete.

Data on forest productivity and their composition come from Moldova Nouă Forest District.

3. RESULTS AND DISCUSSIONS

The study of forest site and forest vegetation from Moldova Nouă Forest District it requires knowledge of the relief conditions, geology, climate, hydrology and soil.

The studied is in southern Banat, leaning on the Danube and belongs Locva Mountains, but also includes small depression Sichevita-Liubcova makes the transition to Almaj Mountains.

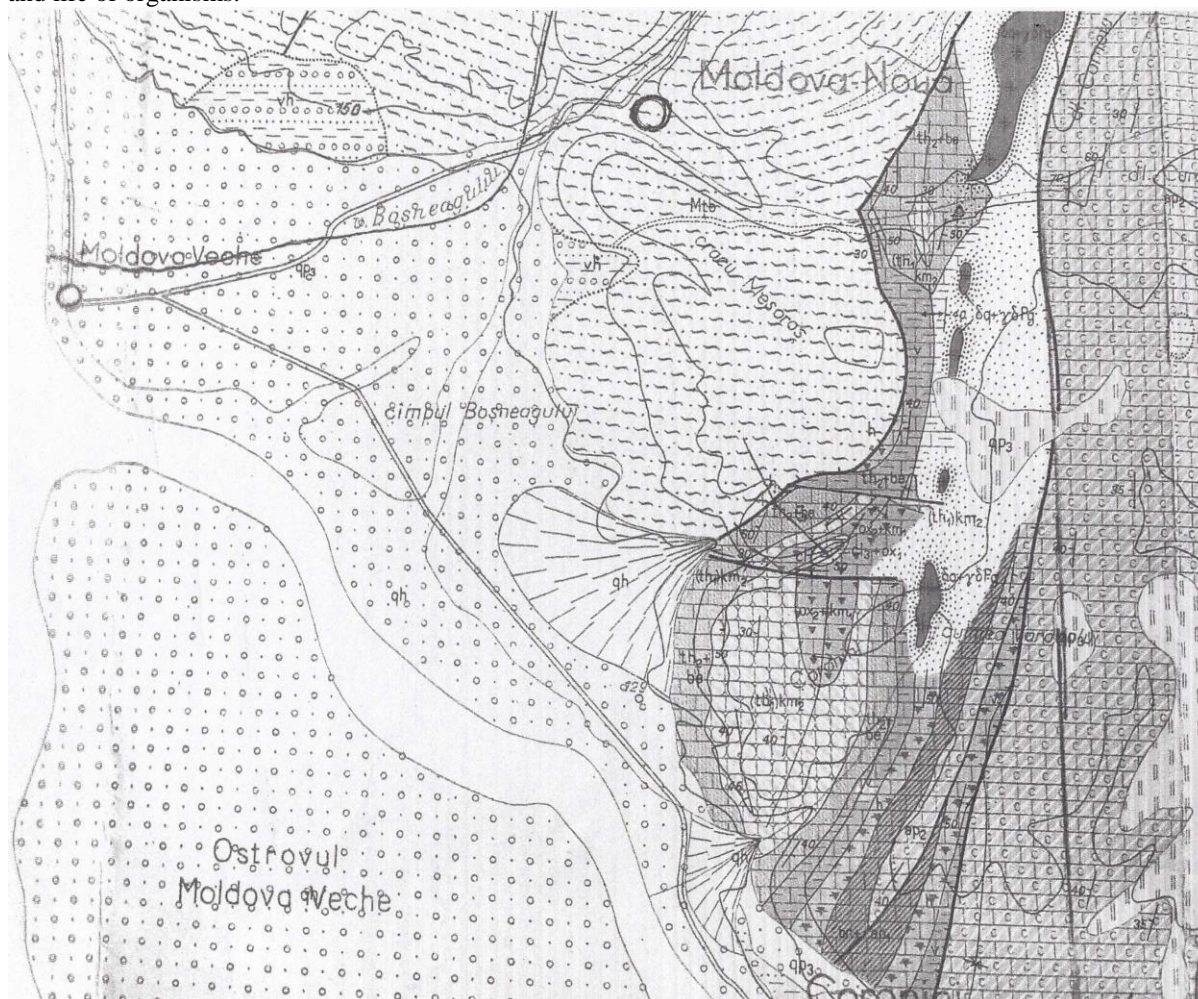


Figure 1. Geological map of Moldova Nouă

Geological map legend of Moldova Nouă forest district

- qh - pebbles and sands, Holocene;
- qp₃ - pebbles and sands of inferior terrace, Pleistocene
- vh - conglomerate, sands and clays, Volhiniane;

- s.cl.pf.al – diorite schists and muscovite-chlorited with albite porfiro, Silurian;
- ap₂ – limestone of Miniş;
- th₂ +be – limestone of Marila;
- th₁ +km₂ – limestone grains of Brădet;
- cl₃ + ox₁ – marl of Tămaşa;

contact mineral and rocks: schists. skarne, corneane;

dq+γdPg – quartz-diorite and granodiorite.

In Locva Mountains crystalline schists belonging to the series of Locva and Lescovița (Figure 1) and magmatic complex gneiss and magmatogene schists.

In the central area appears gneiss with aplite.

In contact with Almăj Mountains are magmatites, predominantly banatites.

Limestone of Anina continues through the series of limestone from Marila, Miniș, and Brădet and marl of Tămașa.

On the southern slopes of Locva Mountains, the Danube tributaries collect Radimna, Boșneag,

Liboradja, Camenița, rivers that have shaped slopes and created valleys.

Danube Meadow widens from Coronini and reaches 2-3 km wide at Sichevița, bounded on the north predominant by beech and hornbeam forests but with ash and Quercus.

The soils study revealed the predominance of types belong to Cambisols class, in Caras-Severin occupying 71.21% of the total [7], represented by Eutric Cambisols (45%) and Dystric Cambisols (26%), with subtypes eutric, dystric and lepti-eutric (table 1)

Table 1. The soils of Moldova Nouă Forest District

<i>SRTS – (Romanian Soil Taxonomy System) - 2012</i>				<i>WRB-SR (World Reference Base for Soil Resources)-2016</i>	
	<i>Soil type and subtype</i>	<i>Symbol</i>	<i>Profile no.</i>	<i>Name</i>	<i>Symbol</i>
1	Rendzină tipică	RZti	1	Rendzic Leptosol	LPrz
2	Eutricambosol - tipic - distric - litic	ECti ECdi ECli	10 12 1	Eutric Cambisols Dystric Cambisols Lepti-eutric Cambisol	CMeu CMdy-eu CMeu-le
3	Dystricambosol - tipic	DCti	2	Dystric Cambisols	CMdy
4	Luvolos - tipic - litic	LVti LVli	6 2	Haplic Luvisols Leptic Luvisols	LVha LVle
5	Alosol - tipic - litic	ALti ALli	2 1	Haplic Alisols Leptic Alisol	ALha ALle
Total profiles			37		

Luvisols class, occupying 20.60% in the county, appears in the territory of Moldova Noua through Luvisol (Haplic and Leptic) and Alosol.

On a small area, where are limestone rocks, have developed Rendzic Leptosols, a soils with pH close to neutral.

Although acid soils, especially Dystric Cambisols and Alisols (Table 2), with base saturation level very low (even reach the value of V 33.18%), soil coating provides favorable development trophic forest species, as seen the data presented in table 2.

Table 2. Analytical data, forest composition, productivity, of Moldova Nouă

<i>Soil</i>	<i>Composition, productivity, forest age, relief</i>	<i>Horizon</i>	<i>Depth, cm</i>	<i>pH</i>	<i>Humus %</i>	<i>T me</i>	<i>V %</i>
RZti-LPrz	4CB, 2 FS, 2 FE, 1 FO, DH, inferior productivity, 115 years, versant, 460m	Am AmR R	0-10 10-20 20-45	6,91 6,90 7,20	3,33 1,93 -	28,83 22,18 -	89,01 85,39 -
ECti-CMeu	8 FS, 1 AP, 1 DH, high productivity, 30 years, versant, 535m	Ao Bv C	0-5 5-25 25-55	5,75 5,65 5,67	1,05 0,84 0,52	18,62 21,10 23,62	73,89 76,11 77,75
ECdi-CMdy-eu	8 FS, 2 DH, high productivity, 120 years, versant, 420 m	Ao Bv C	0-2 2-15 15-40	4,75 4,66 5,39	3,36 1,33 0,99	29,41 20,93 13,56	38,56 56,74 57,47
ECli-CMeu-le	10 FS, , inferior productivity, 70 years, versant, 230m	Ao Bv BvR	0-7 28 38	5,30 5,65 5,24	3,27 1,33 0,75	9,90 11,94 9,01	54,43 62,21 57,62
DCti-CMdy	8 QP, 2 CB, middle productivity, 60 years, versant, 400 m	Ao Bv BvC	0-8 20 75	4,90 4,78 5,28	3,60 1,09 0,93	22,05 16,23 14,24	50,83 40,37 55,55
LVti-LVha	4 QF, 2 QP, 2 PS, 2 DH, middle productivity, 40 years, versant, 370 m	Ao El	0-8 26	5,42 5,17	3,72 1,11	25,05 19,67	69,51 72,26

		Bt	54	5,32	0,58	18,97	69,32
LVli- LVle	10 FS, inferior productivity, 90 years, versant, 310m	Ao	0-8	4,57	2,03	14,00	46,00
		El	25	5,67	1,63	13,50	54,12
		BtR	41	5,31	0,85	11,98	51,72
ALti- ALha	10 FS, inferior productivity, 85 years, versant, 550m	Ao	0-7	4,55	2,18	17,14	34,89
		El	25	4,38	1,32	19,94	37,20
		Bt	45	4,62	1,11	13,68	33,18
ALli- ALle	4 FS, 4 QC, 2 CB, inferior productivity, 70 years, versant, 140m	Ao	0-4	5,47	1,34	17,05	45,00
		El	20	4,78	0,52	13,63	37,98
		BtR	40	5,13	0,32	11,96	48,04

Legend: FE – Fraxinus excelsior – ash tree, FS - Fagus silvatica - beech; CB - Carpinus betulus - ironwood; FO – Fraxinus ornus- flowering, ash; AP – Acer pseudoplatanus – maple; QP – Quercus pedunculata –common oak; QF – Quercus frainetto – oak; PS – Pinus silvestris – pine; QC – Quercus cerris – bitter oak; DH – diverse hard.

Lower productivity is primarily caused by the presence of hard rocks (leptic subtype) which lends short soil profile (thinner than 50 cm).

In most of the 37 stations surveyed near the soil profiles dominate beech.

The presence of areas without forest, due to unreasonable cuts or fires, favored the outbreak and intensification of surface erosions, strong or even excessive, which have led to the parent material, with the total loss of soil.

Remedy this effect, total negative, imposes slope stabilization works, such as those from Sichevița (Figures 2, 3) and reforestation.



Figure 2. Terraces lean upon fences



Figure 3. Land improvement in a slope >30%

4. CONCLUSIONS

Although the role of exceptional importance for human life of forests is known and generally

accepted, economic interests and poor legislation continues to work towards the reduction of forest areas.

The consequences are gravely for the climate, water, soil, transportation and biodiversity.

In Moldova Nouă Forest District efforts are made to maintain the wooded areas, especially those conditions for forest sites.

The soil provides nutrients necessary beech and hornbeam development, and other deciduous species such as Quercus (common oak, bitter oak), ash-tree and maple.

Stabilization works from the Sichevița eroded slope have been successful; the experience gained may lead to the extension of such works.

Through a rational exploitation of forests, for wood and other non-timber, forest can preserve and even expand.

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