LAND FOUND OF BANAT

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Abstract: *A durable management of the natural and anthropic resources , represent a modern form for ecosystem, in order that maintain and increase the biodiversity in agricultural produces in quantity and high quality long-term. To that end it is necessary to locate and define every plot with its ecological conditions, the soil suitability and capability for specific land use agricultural, sylvan, social-economic. The geographical position of the territory, situated between $44^o27'$ and $48^o48'$ northern latitude, and $20^o15'$-$22^o52'$ eastern longitude, with a relief arranged in steps, sloping form east to west, determine a great diversity of ecological conditions and the structure of the land resources. The approached problems relates to a surface of 1.891.684 ha, with 62.56% agricultural land (1.183.343 ha) situated of south-west of Romania, which belong administrative to the countries: Timis, Caras-Severin, Arad (south of river Mures) Mehedinti (area of the town Orsova), for the most part of the region viewed historical Banat. The soil survey has been identified in agreement with Romanian Taxonomyc Soil System (SRTS-2012), 23 soil types and soil association, involved inside of 11 soil class: Protisoil, Cernisoil, Umbrisoil, Combisoil, Luvisoil, Spodisoil, Vertisoil, Hidrisoil, Salsodisoil, Histisoil, Antrisoil. The paper presents, for this region, the capability of the land in crop, which is in total 832.925 ha:*

- *Lands without limitations 217.617 ha (18.29%)*
- *Land with small limitations 169.336 ha (14.31%)*
- *Land with medium limitations 273.234 ha (23.09%)*
- *Land with great limitations 276902 ha (23.40 %)*
- *Land with several limitations 246.254 ha (20.81 %)*

The paper, also offers methods for soil evaluation and for the characterization of the natural and anthropic modification ressources, useful for scientific research and agricultural practice together with environmentprotection.

Key words: *management, resources, soil types, capability*

INTRODUCTION

The natural resources represented by water, air, soil, vegetation and fauna, constitute a complex temporal and spatial formation which works like cybernetic system, with permanently changes between ph to cenothic and zoocenathic element and with surrounding environment.

Telluric and edaphic resources, as a basic constituent of terrestrial ecology, presents some properties defined and studied in the course of the time (CASTE AND CALL, 1997, CRACIUN, 2000, DUMITRU AND CALL 2000, FLOREA 1985,1997, ROGOBETE AND CALL, 1997, TEACI, 1980, 1983, 1995, TARAU 1998)

This interconditioning has been present in the last years also in a lot of numbers international organism as FAO, UNESCO (Rio de Janeiro, 1992, Johaneseburg, 2002)all of them consider that the biodiversity is very important and must be protected.

Agenda 2030 for durable development adopted on September 25th 2015 from the Unite de Navions of Organization (ONU) has been established a global frame-work of durable development until the year 2030, on the Development Objectives for new millennium, adopted in the year 2000, according to whom, soil is the common dominator in order to identify and

apply the strategies for global problems of the century 21st which are : climatic changes, food insecurity eutophication and contamination of the natural water, last of the biodiversity, poverty in rural country, etc. So as to explain the grate diversity and variation of the soils in the territory it is used the term " pedodiversity" which means a method for "explore, quantify and compare the complexity of the pedolandscape in different areas and environment" Mc. Brantnei, Ddeh ano, Ibranez (quote from FLOAREA 1997).

The authors present in this paper, on the basis of the data extracted of the scientific research thematic, and on the basic of an impressive volume of data from OSPA Timisoara archive (office of pedological and agrochemical study) same aspects of the natural environment and its characteristics.

The paper supports, also, the public administration for a good management programs of the natural resources (soil, water, biodiversity)

MATERIAL AND METHODS

The problematic tackled relates on area of 1.891.690 ha (table 1), from which 1.183.343ha (62.56%) are agricultural land, situated in south-west of Romania, which belong administrative to the countries: Timis, Caras-Severin, Arad (only south of river Mures) Mehedinti (area of the town Orsova), all of these belonging of the region named Historical Banat.

Table 1

The structures of areas for main categories of land use

Specification	Land in crop	Pasture	Meadow	Vineyard	Orohard	Agric land	Forest	***Other***	***Total***
Timiş	*528242*	*123552*	*28535*	*4695*	*8393*	*693417**	*109465*	*66783*	*869665*
%	**60,74**	**14,21**	**3,28**	**0,54**	**0,96**	**79,73**	**12,59**	**7,68**	**100**
Caraş-Severin	*126873*	*183341*	*74562*	*771*	*11452*	*396999**	*411276*	*43701*	*851976*
%	**14,89**	**21,52**	**8,75**	**0,09**	**1,35**	**46,60**	**48,27**	**5,13**	**100**
Arad	*64620*	*15500*	*4573*	*222*	*1605*	*86520*	*26168*	*6257*	*118945*
Mehedinţi	*1315*	*2577*	*2418*	*22*	*75*	*6407*	*25558*	*19143*	*51108*
Total ha	*721050*	*324970*	*110088*	*5710*	*21525*	*1183343*	*572467*	*135884*	*1891694*
%	**38,12**	**17,18**	**5,82**	**0,30**	**1,14**	**62,56**	**30,26**	**7,18**	**100**
%	*60,94*	*27,46*	*9,30*	*0,48*	*1,82*	*100*			
** *Timiş-Torontal*	581087	56704	33779	11028	3413	686011	52865	21124	760000
%	***76,46***	***7,46***	***4,44***	***1,45***	***0,45***	***90,26***	***6,96***	***2,78***	***100***
** *Caraş*	123131	50696	27400	3533	8191	212951	193981	62368	469300
%	***26,24***	***10,80***	***5,84***	***0,75***	***1,75***	***45,38***	***41,33***	***13,29***	***100***
** *Severin*	128707	73658	56453	170	11595	270583	263279	108338	642200
%	***20,04***	***11,47***	***8,79***	***0,03***	***1,80***	***42,13***	***41,00***	***16,87***	***100***
Total ha	***832925***	***181058***	***117632***	***14731***	***23199***	***1169545***	***510125***	***191830***	***1871500***
%	***44,50***	***9,67***	***6,29***	***O,79***	***1,24***	***62,49***	***27,26***	***10,25***	***100***
%	*71,22*	*15,48*	*10,06*	*1,26*	*1,98*	*100*			

Historical Banat (fig 1.) is delimited of north of the river Mures, between Nadlac and Salciua, of east from the ridges of mountains Poiana Rusca, Tarcul, Cernei and Mehedinti, of south from river Dunarea, between Orsova and Bozias, and Serbian Banat until river Tisa.

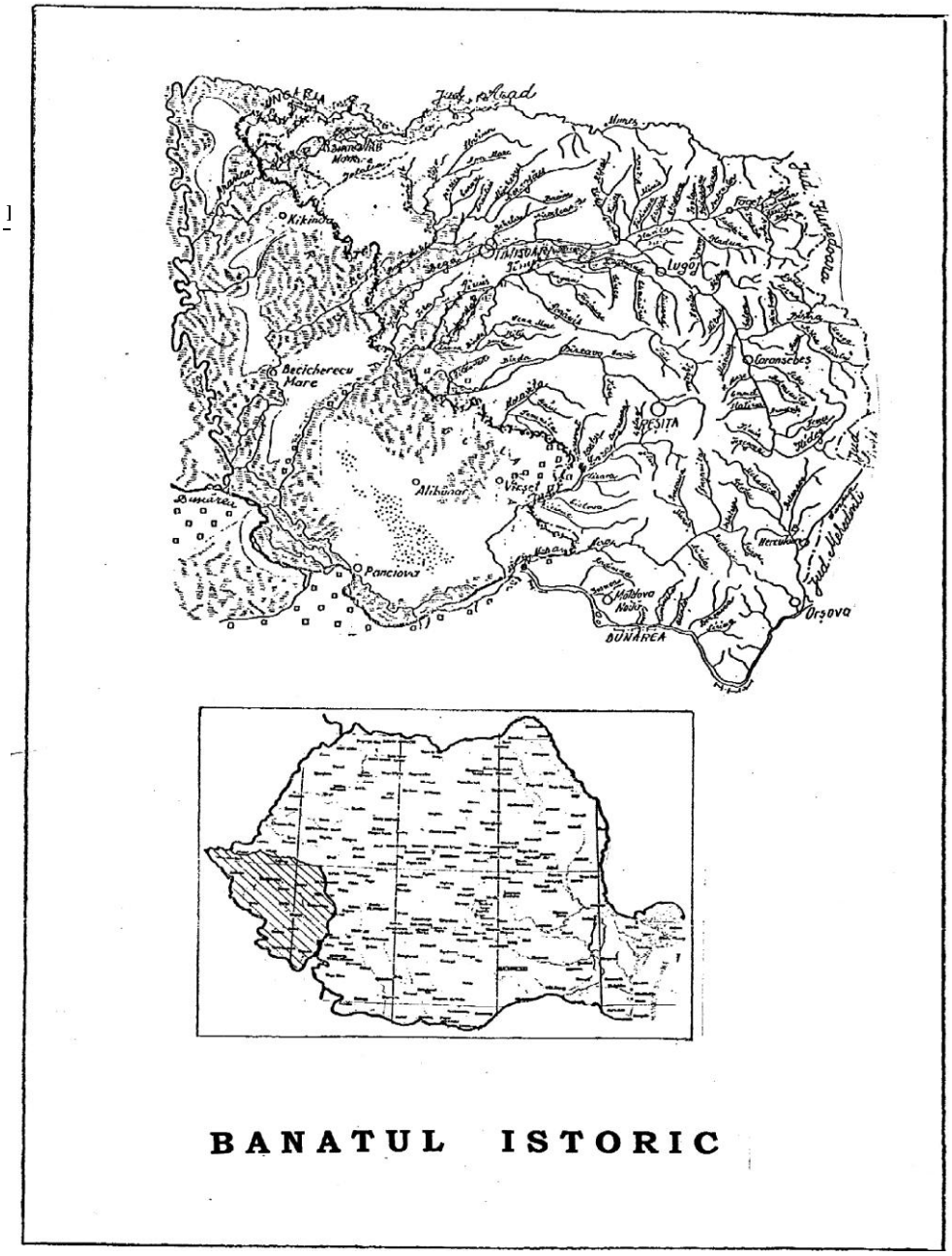

Figure 1. Historical Banat

The scientific research of the pedological andecological conditions has been made in accordance with " Metodologia Elaborarii Studiilor Pedologice, vol I, II, III" elaborated from I.C.P.A. Bucuresti, in the year 1987, and with SRTS-2012 (Romanian Soil Taxonomy System). It has been used pedological informations existed in the OSPA Timisoara and Arad registry. Soil analysis and survey has been effectuated in the laboratory for physical and chemical analysis " OSPA-USAMVBT " , Timisoara, accredited RENAR, in accordance with STAS SR. EN. ISO/CEI 17025, certificate, no. Li 1001/2013.

RESULTS AND DISCUSSIONS

Banat's relief is characterized about a great complexity of morphological shapes, from flood-plain, alluvial plain, subsidence plain(altitude 70-80 m) piedmont plain, old delta, table land and high hills, until to high mountains, with mountains of 2291 m.

In this segmentral altitude, white a difference in level of about 2200m, relief of Banat unfolded in the shape of monumental land harmonious amphitheatre, open to north-west.

The ample relief units are: Mountain of Banat, Hills of Banat, Depressions, Plains od Banat and Flood-plains.

The other characteristic is generated by the withdrawal of Pannonic lake, which have had been, unthil de 19th century a great area with bogging up and insalubrious (Fr. Grischini, 1779) and 877.600 ha of sloughs and swamply field (ROGOBETE, 1985)

The great structural and socio economics diversity is reflected in the agricultural lands distribution, the land use is near the maximum parameter- 62.53% (Timis-79.73 %, Caras-Severin 46.26%) from the total area.

In the interwar period, the agricultural land represented 62.49% from the land resources, respectively: Timis- Torontal 92.26%, Caras 45.38%, Severin 42.13%

The land use of agricultural land is dominated by land in crap (60.94%) like as at the village Foeni (80%), Belint (85%), Banloc (85%), Sag (87%), Beba Veche (98%), Biled (89%), Comlosu Mare (94%), Felnac (92%), Fantanele (92%). This situation is due to fact that in Banat region have been effected a lot of meliorative soil sience mesures, after drainage of marsh, regularized the main river, and soil erasion control in the area of hills.

The situation of land use in the piedmosit zone is distinct, the land in crap is only 30-60% from the land resources: Fardea (31%), Criciova (39%), Bara (39%), Birchis (46%), in the mountain zone, the land in crap is smaller: Tomesti (6.5%), Ieselnita (11%), Pietroasa (13%) Orsova (21%).

The areas with pasture and meadow totalized 435.058 ha , from which pastures are 324.970 ha (27.46%) and meadows are 110.088 ha (9.30%), nameby 36.76% from the total agricultural land.

Forest land represents 30.26% from the total area of the region Banat, nomly 572.467 ha, the great weight are in the Caras-Severin country, with an area of 411.276ha (71.84%)

Land improvement, especially the draining of lake, marshes usually have been reduce the area with hydrophil and hygrophilous ecosystem, from 10.926 km ^{2} to areas with only to tens km^2. At the present time is a trend to aridity because of descent the ground water table (Rogobete 1985)

The extension of the agricultural lands on the plain is Banat region has determined a great desrease od areas with forest from about 30.000 ha and simultaneously and intensification of the soil erasion.

In accordance with Romanian Soil Taxonomy System (S.R.T.S.-2012) the soil cover in the Banat region present a great diversity. It has been identified 23 soil types (table 2) and soil associations involved in eleven soil class (there are 12 classis in total):Protisol, Cernisol . Umbnsol, Cambsol, Luvisol, Spodisol, Vertisol, Hidrisol, Salsodsol, Histisol, Antrisol (Andrisol class is absent). It can be seen that there is a great similarity between SRTS and WRB (1998).

The agricultural land from Banat have been disytributed into the next land capability classes for tge land use “Land in crop “:

1. Land without limits are unrestrained (site evaluation with mark between 81-100 points)
   There are soil like Chernozems, Phaeozems, Eutric and Mollic Cambrecols (weakly gleyied, phrealic moist) medium texture, natural reaction, and occupy 18.29% respectively 217.617 ha.
2. Land with small limits or restrictions (marks between 61-80 points) sandy-loam, pH 6.3-7.8, periodically water- logging occupy 14.31% respectively 169.336 ha

Need works for prevention and control for periodically water-logging, fertilization with natural semi fermented organic manure, and green manure at short interval (1-2 years) liming.

Table 2

The major soil types from Banat

No	Type/subtype SRTS-2012	Type/subtype WRB-1998	Land in crop	Pasture	Meadow	Vineyard	Orohard	Agric land	Forest
			Ha/ %	Ha/ %	Ha/ %	Ha/ %	Ha/ %	Ha/ %	Ha/ %
			72	20668	11636	-	32	32408	1947
1	**Litosol**	**Leptosol**	0,01	6,36	10,57	-	0,15	2,74	0,34
			-	44358	6121	82	1974	52535	4465
2	**Regosol**	**Regosol**	-	13,65	5,56	1,44	9,17	4,44	0,78
			1154	195	11	9	6	1375	687
3	**Psamosol**	**Arenosol**	0,16	0,06	0,01	0,15	0,03	0,12	0,12
			68500	20766	11537	67	321	101191	11220
4	**Aluviosol**	**Fluvisol**	9,50	6,39	10,48	1,17	1,49	8,55	1,96
			155026	6629	1343	517	635	164150	744
5	**Cernoziom**	**Chernozem**	21,50	2,04	1,22	9,05	2,95	13,87	0,13
			38216	650	1365	199	745	41175	573
6	**Faeoziom**	**Phaeozem**	5,30	0,20	1,24	3,50	3,46	3,48	0,10
		Rendzic	-	1820	892		258	2970	7671
7	**Rendzină**	**Leptosol**	-	0,56	0,81	-	1,20	0,25	1,34
		Humic	-	2600				2600	973
8	**Nigrosol**	**Umbrisols**	-	0,80	-	-	-	0,22	0,17
		Cambic	-	2405				2405	1030
9	**Humosiosol**	**Umbrisols**	-	0,74	-	-	-	0,20	0,18
		Eutric	73979	39257	17460	211	1427	132334	197043
10	**Eutricambosol**	**Cambisol**	10,26	12,08	15,86	3,69	6,63	11,18	34,42
		Dystric	54800	67853	23240		413	146306	49461
11	**Districambosol**	**Cambisol**	7,60	20,88	21,11	-	1,92	12,36	8,64
			130654	12284	2477	1786	4566	151767	90908
12	**Preluvosol**	**Halpic Luvisols**	18,12	3,78	2,25	31,28	21,21	12,82	15,88
			110321	31847	9886	154	4766	156974	163668
13	**Luvosol**	**Albic Luvisols**	15,30	9,80	8,98	2,70	22,14	13,27	28,59
			3605	1202	231	20	187	5245	-
14	**Planosol**	**Planosols**	0,50	0,37	0,21	0,35	0,87	0,44	-
			793	1754	-	-	-	2547	859
15	**Prepodzol**	**Cambic Podzols**	0,11	0,54	-	-	-	0,22	0,15
		Halpic	2163	2210	-	-	-	4373	5667
16	**Podzol**	**Podzols**	0,30	0,68	-	-	-	0,37	0,99
			58117	32498	3765	23	480	94883	9675
17	**Vertisol**	**Vertisols**	8,06	10,00	3,42	0,40	2,23	8,02	1,69
			8076	16703	15985	-	-	40764	4294
18	**Gleiosol**	**Gleysols**	1,12	5,14	14,52	-	-	3,45	0,75
			3533	3249	2697			9479	10190
19	**Stagnosol**	**Stagnosols**	0,49	1,00	2,45	-	-	0,80	1,78
			7355	12772	936			21063	-
20	**Soloneț**	**Solonetz**	1,02	3,93	0,85	-	-	1,78	-
			-	390		-	-	390	-
21	**Histosol**	**Histosols**	-	0,12	-	-	-	0,03	-
			3677	1690	121	2625	5588	13701	-
22	**Antrosol**	**Anthrosols**	0,51	0,52	0,11	45,97	25,96	1,16	-
			1009	1170	385	17	127	2708	11392
23	**Tehnosol**	**Technosols**	0,14	0,36	0,35	0,30	0,59	0,23	1,99
			721050	324970	110088	5710	21525	1183343	*572467*
Total			100,00	100,00	100,00	100,00	100,00	100,00	

3. Land with average limits or restrictions (marks between 4-60 points), representing 2309%, respectively 273.234 ha. Soils with moderate- strong acidity, periodic stagnant moisture regime from precipitations, weaje-moderate erosion.

Demonds limiting with return after 5-7 years, natural fermented organic monure at 3-4 years interval, fertilization with PK improvement of the air and water regime, land improvement rills, gullies, slape channels, drainage.

4. Land with grate limits or restrictions (marks between 21-40 points) which represents 23.40 % respectively 276.902 ha, and include soils with unfavourable physical and chemical properties, as follows : Luvisols, Plansosols, Vertisols, Pellic-Vertisols.
   Demands land improvement, for aeration-scrifying, drainage, amendament with limestone gypsum, specific soil management, variety of appropriate plants.
5. Lands with several limits or restrictions (maries between 1-20 points) which content Gleysols, Stagnosols, Solonchks, Solonetz, Technosols, and strong eroded soil s, and landslides. Those lands representing 20.81% resprectiv 246.254 ha.

CONCLUSIONS

A wide knowledge of natural conditions and especially of ecological potential of lands for the main land use and crops, represents a particularly useful for site evaluation, motive for a periodically soil survey and agrochemical survey.

Those data are helpfully for a different soil technology, for land improvement foundation and improving foundation and improving the soil through cropping and increasing the soil fertility.

In view of these aspects in which the principal parameter for the assessment of the future production in the ecopedological value in the shape of marks from site evaluation, we appreciate that these marks a very important.

Because the soil is the most important capital goods for agriculture and forestry, with a certain use value, it is absolutely necessary to protect and to increase their quality.

Those data are also very necessary for civil service and local authority in order to unroll the conjunct program, like Natural Rural Development.

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