THE BONITATION STUDIES AND THE TECHNOLOGICAL CHARACTERISATION OF THE LAND, NECESSARY FOR THE CADASTRIAL ORGANIZATION OF THE TIMIS COUNTY

STUDIILE DE BONITARE ŞI CARACTERIZAREA TEHNOLOGICĂ A TERENURILOR, NECESARE PENTRU ORGANIZAREA CADASTRALĂ A JUDEŢULUI TIMIŞ

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***Abstract**: The problem tackled in this paper refers to a surface of 869665 ha out of which 702398 ha represent arable land.*

The physico-geographical characteristics of the territory are presented in brief, but those concerning the structure of the edaphic cover and some restrictive characteristics of the quality and usage of the land are presented at large.

The diversity of the physico-geographical conditions determined the formation of various soils from the chernosems of the sylvosteppe to the podzols of the mountainous zone. Therefore local peculiarities for the territory organisation works are needed. How a piece of land is used depends on the climate, its relief, its hydrologic and edaphic peculiarities which can determine the kind of land usage.

Finally we present the general measures that must be taken to for a good management of the cadastral resources of the space taken into consideration.

***Rezumat:** Problematica abordată se referă la o suprafaţă de 869665 ha din care 702398 ha terenuri agricole.*

Sunt redate succint, dar cuprinzător caracteristicile fizico-geografice ale zonei, iar mai pe larg alcătuirea învelişului edafic, unele caracteristici restrictive ale calităţii şi pretabilităţii terenurilor pentru principalele categorii de folosinţă sau diferite utilităţi.

Diversitatea condiţiilor fizico-geografice a determinat formarea unor soluri variate de la cernoziomurile din zona silvostepei la podzolurile din zona montană fapt ce imprimă lucrărilor de organizare a teritoriului particularităţi locale.

În final sunt prezentate măsurile ce trebuie întreprinse pentru realizarea unei gospodăriri durabile a resurselor cadastrale ale spaţiului luat în considerare.

***Key words**: study, land,organisation, cadastre, territory*
***Cuvinte cheie**: studiu, teren, organizare, cadastral, teritoriu*

INTRODUCTION

The study of the rural space resources permits the establishing of priorities for its rehabilitation through readjustment and reconstruction.

Within this process the natural resources and those induced antropically, the land fund, the agroforestry and social funds, will determine the development direction of the rural space: agriculture, industry, services, agro tourism, etc.

The natural resources consist of the sum total of the resources existing in nature: soil, water, air, flora, fauna, solar energy, etc. They are extracted from their natural medium and transformed under certain technological, economical and social conditions into goods whose usage implies their direct consumption.

The manner of use of these resources must be complex and coordinated so that many goals can be obtained simultaneously and they harmonize with the exigencies of the environment protection. (HARTIA 1978, CANARACHE 1980, TEACI 1980, CÂRSTEA

1995, FLOREA ŞI COLAB. 1978, DUMITRU ŞI COLAB. 2000, VLAD 2003, ȚĂRĂU and COLAB. 2005).

The applying of inadequate technologies can cause certain irreversible changes of the natural resources, modifying thus their „regenerable" character.

Pollution transforms almost irreversibly the regenerable natural resources.

Based on their longstanding scientific researches and on the massive database to be found at the OSPA Timisoara archives, the authors of this paper presents some aspects referring to the soil quality condition as well as the evolution of the factors that are involved in it.

MATERIALS AND METHODS

The researches were performed on an area of 869665 ha, out of which 700477 ha are arable land.

Table 1

The structure of the surfaces for the main usage categories

Specification	Arable land	Pastures	Hayfields	Vine-yards	Orchards	Agricultural land	Forests	Body of Water	Roads and railways	Yards and constructions	Unproductiive land	TOTAL
Ha	531593	125684	29497	4457	9246	700477	109057	15775	18712	22309	3335	869665
%	61.13	14.45	3.39	0.51	1.06	80.55	12.54	1.81	2.15	2.57	0.38	100%
%	75.89	17.94	4.21	0.64	1.32	100	-	-	-	-	-	-

OJCPI Timis/ from the statistical report about the situation of the land fund (31thof dec. 2006).

The researches of the eco-pedological conditions, the filing and processing of the data were carried out according to the Methodology for the elaboration of the pedological studies (vol. 1, 2, 3) issued by I.C.P.A. Bucuresti in 1987 and by the Romanian Soil Taxonomy System (SRTS 2003).

RESULTS AND DISCUSSIONS

Due to its geographical position, the territory taken into consideration, estimated to lie between 20º 16' (Beba Veche) and 22º 23' (Poeni) east longitude, 45º 11' (Latunas) and 46^{0}11' (Cenad) north latitude respectively presents a large diversity of ecological conditions, determined by the variability of all factors take part in achieving an environment in which plants grow and give crops.

The surface structure is characterized by a large diversity of geomorphologic forms bound to the genesis and evolution of the whole Carpathian-Danubian territory. This territory is divided into three different parts (fig. 1).

- The eastern sector, the highest one, formed by the northern ramifications of the Poiana Ruscăi Mountains.
- The central sector, formed by hills (D. Lipovei, D. Lugojului, D. Buziaşului) and plains (C. Vingăi, C. Sacoşului, C. Gătaiei).
- The western sector, the lowest one, formed by low plains and meadows (C. Arancăi, C. Galațcăi, C. Timişului, C. Bârzavei).

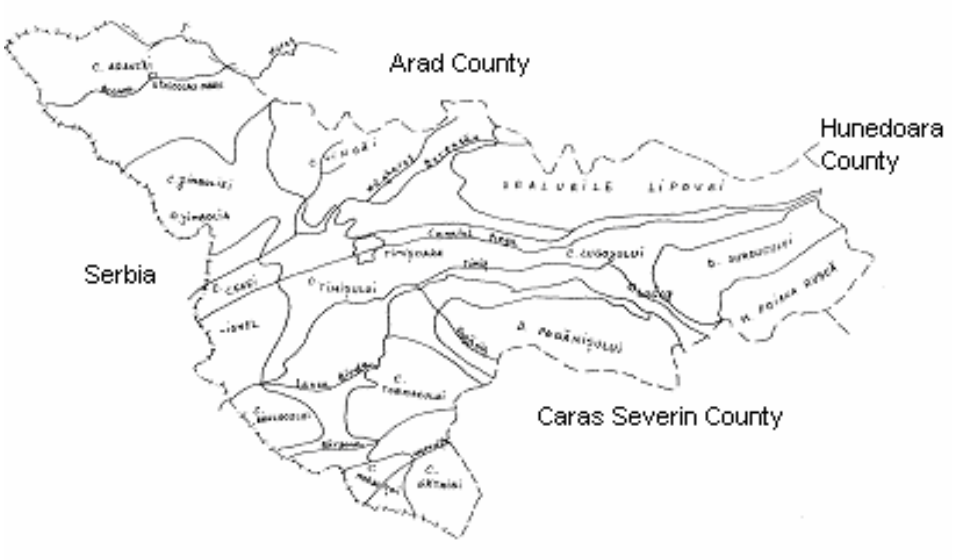

Figure 1. The main physico –geographical unities

The territory is crossed from east to southwest by the Bega, Timis and Beregsau rivers.

The macroclimatic characteristics of the Timis Country are determined by the geographical position within the European continent, to which is typical a certain atmospheric circulation. This is determined either by the dynamic action centres (azoric and subtropical anticyclone) or by the seasonal thermo action centres (Siberian and Asiatic anticyclone).

The Timis country lies at the interference of the western maritime air masses with the eastern continental ones, but it is also invaded by southern warm air masses that cross the Mediterranean Sea.

The relief characteristics and the pedoclimatic conditions allowed that the arable land form 75.85 % of whole the agricultural surface, 61.13% respectively from the whole 869665 ha (tab. 1) and is represented as follows: 55.30% low plains and meadows, 34.70% high plains and terraces, 8.70% hills and 1.3% mountains (Tab. 2).

Pastures occupy 17.84% and their spreading within the main forms of relief is:28.90% meadows and low plains, 18.50% high plains and terraces, 27.8% hills and terraces and 24.80% mountains. The surface covered with vineyards and orchards represent only 1.75% of the total surface of the county.

The forestry fund is weakly represented and is found on degraded surfaces covering only 109057 ha, 12.54% respectively, and its spreading within the main forms of relief represents: 16.80% meanders and low plains, 9.20% high plains, 58.80% hills and 15.20% mountains.

If we compare these data with the Central European countries such as Germany or Austria in which the forests cover 35-37%, it results that the studied territory is unbalanced from the point of view of the usage as he proportion of the arable land is much larger than the physical-geographic characteristics of the studied space.

This usage intensity is very close to the maximal usage parameters of the land fund. 80.55% of the whole surface (tab.1) is used for different specific agricultural activities and 61.13% is cultivated with cereals, technical plants, etc. This intensity is due to the first

reclaiming works and those of the river regulations started in 1728 by the Austrians and continued up to now by the different pedo-hydro- ameliorative activities.

Table 2

The usage categories within the main relief forms

Relief	Arable		Pastures and hay- lands		Vineyards and orchards		Agricultural		Forests		Others		TOTAL	
	ha	%	ha	%	ha	%	ha	%	ha	%	ha	%	ha	%
Low plains and meadows	293971	55.3	44847	28.9	247	1.8	338330	48.3	18322	16.8	4931	8.2	362650	41.7
High plains	184462	34.7	28708	18.5	1316	9.6	214346	30.6	10033	9.2	29945	49.8	258291	29.7
Hills	46248	8.7	43141	27.8	11278	82.3	100869	14.4	64126	58.8	16115	26.8	176542	20.3
Mountains and depressions	6912	1.3	38485	24.8	862	6.3	46932	6.7	16576	15.2	9141	15.2	72182	8.3
TOTAL ha, % %	531593 61.13 75.89	100.0	155181 17.84 22.15	100	13703 1.58 1.96	100	700477 80.55 100.0	100	109057 12.54 -	100	60131 6.91 -	100	869665 -	100.0 100.0

The soil evaluation studies and technological characterisation studies of the land carried out by OSPA offers information about the eco-pedological offer, about the valuation and evaluation of the land quality. All these are necessary for the elaboration of technologies capable to assure an ecological equilibrium and they are founded on the results from the long terms experiments with fertilizers , soil limings and assolaments, to be found in the specific pedoclimatic zones of the Timis county and led by the following institutions: USAMVB Timisoara, SCDA Lovrin, OSPA Timisoara, SCDCP Timisoara.

As a result of the diverse physical-geographic condition, of the soil characteristics and antropical intervention the productivity of the agricultural land is much different in time and space.

Based on the data to be found in the OSPA Timis archives and processed according to the Methodology for the elaboration of pedological studies (ICPA, Bucuresti, 1987) and to other normative acts reactualized by the MAAP resolution 223/2002, the agricultural land of the Timis county is categorised as it follows (fig. 2).

1. *Land with no limitations or restriction* (with bonitation scare between 81-100 points) is represented by chernozems (typical, cambic, moderate and stighly gleyied) with medium texture, neuter reaction that occupies 17.3% of the surface, 121183 ha respectively. On this hand is necessary only to apply and to stick to the agro techniques corresponding to the cultivated plants and the characteristics of the relief.

2. *Land with reduced limitations and restriction* (with a bonitation scare between 61-81 points) due to the sandy-loamy texture, slightly acid and alkaline reaction and periodical humidity excess. This type of land occupies 24.5% of the surface, 172087 ha respectively. It is necessary to prevent and control the periodic humidity excess(caused by rain or ground water). Organic half fermentated fertilizers or green ones must be applied at short periods of time , of 1 to 2 years. Liming must be carried out depending on the agrochemical indices value

3. *Land with moderate limitations and restrictions* (evaluation grades between 40-60 points) represents 25%, 176302 ha respectively, and is formed by soils with a moderate strongly acid reaction, with a periodical stagnating precipitation regime, or affected by slight medium erosion. On this land the soil can be rapidly acidificated because of many reasons such as: nitrogen and phosphorus deregulation of the nutrition in spring, the molybdenum nutrition deregulation , with applying a large or unilateral nitrogen dose, aluminium toxicity for the majority of plants and magnesium toxicity at sensitive plants.

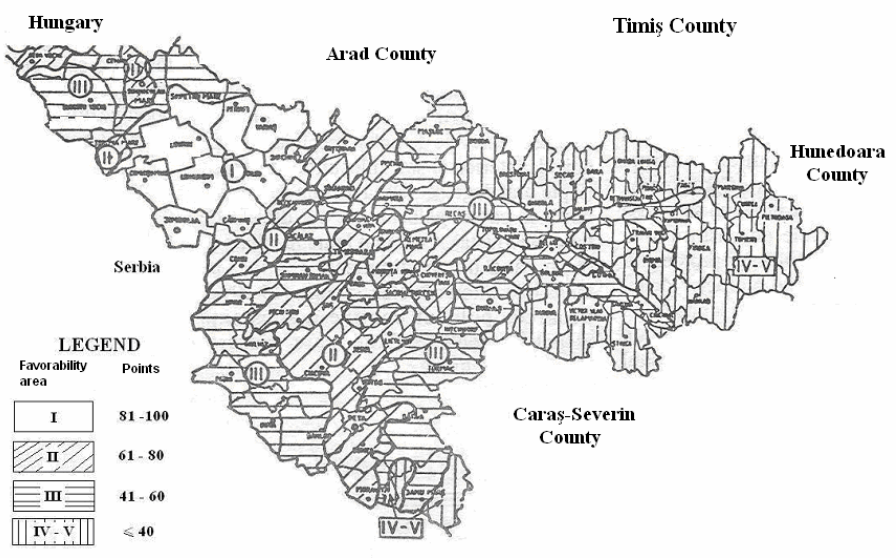

Figure 2: Land categories of Timis County

4. *Land with severe limitations and restrictions* (with a bonitation scale between 21 to 40 points) represent 23.5%, 165063 ha respectively, and includes hydromorphic and physico-chemical characteristics. For its usage as an arable land it is necessary to take a complex of ameliorative measures: drainage, gypsum melioration, specific agro technique adequate plants.

Because of the severe restrictions to which these surfaces are subdued, they remain pastures or they will be transformed into ponds, rice fields.

5.*Land with very severe limitations and restrictions* (with a bonitation scale from 1 to 20 points) formed by soils with deep and excessive erosion stagnic humidity excess, representing 6.3%, 44251 ha respectively, of the discussed territory.

This land is in danger of nutrient deregulation with macro and micro elements depending on the soil characteristics and parental material.

It needs radical fertilization measures, differing on the soil and needs of the cultivated plants. For a good valorification of these soils they must be terraced, buffer strips must be sown, shelter belts must be provided, slope channels must be dug and taluses consolidated.

6. *Land with very severe limitations and restrictions* (improper for agriculture) with excessively erodated soils, with deep erosion or with hard visible rocks, situated on slopes, representing 3.3%, 23,179 ha respectively.

The afforestration works are necessary to control the deep and surface erosion. These measures are also recommended for the bank-dam zone of the dammed up precincts.

CONCLUSIONS

The cadastre is very important for a country as it guaranties the right of property their over real-estate and it also determines the value. Therefore the mapping bonitation and evaluation of the land is necessary.

Mapping, bonitation and evaluation are important too, because besides its historical natural value, the land is the most important means of production in agriculture and forestry. It is also a means of property and has in the market a certain value.

The systematic pedological and agrochemical mapping carried out by the Pedological and Agrochemical institutes from our country offers valuable data concerning the evolution of the quality status of the soils, the differentiated establishing and application of culture technologies, the bonification of the land, the favoured cultures, the land works, the ameliorative technologies, the organisation and systematisation of the territory.

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