# SOIL RESOURCES IN THE PERIMETER OF THE COMMUNE OF BANLOC, ROMANIA, IN THE CONTEXT OF SUSTAINABLE USE

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***Abstract..****The soil resources of the Commune of Banloc, Romania, are presented, namely: identification and eco-pedological characterization of the Territorial Administrative Unit within the investigated space; studying natural conditions: relief, lithology, climate, hydrography and hydrology, vegetation and fauna, soils; studying the cosmic-atmospheric supply specific to the researched area; identifying, studying types and subtypes of soil and soil morphological, chemical, physical and hydro-physical properties; characterization of the soil cover, determining the quality class for the arable use category and the establishment of suitability for the main categories of plants cultivated. The main object of study is the land belonging to this territorial administrative unit, i.e., soils identified in the perimeter. As a general overview of the soil resources in the Bîrzava-Timis interfluve, it can be said that, except for the soils such as chernozems and those on dune-like forms, all other soils create a number of difficulties for agriculture in the area. During the vegetation period (in the summer months), a large part of the soils is successively affected by excess and moisture deficiency, both factors having the effect of diminishing production. The researched territory is characterized by a continental temperate climate, with shorter and milder winters. Annual average precipitation is 604.7 mm.*

***Keywords****: soil resources, sustainable use, eco-pedological conditions*

## INTRODUCTION

The Commune of Banloc borders north with the Commune of Ghilad, south with Serbia, southeast with the Commune of Denta and the limit of the administrative territory of Deta, and west with the Commune of Livezile.

This locality is made up of the villages making up the Commune of Banloc – Banloc (278.09 ha), Ofseniţa (86.22 ha), Partoș (79.15 ha), Soca (103.82 ha) – and has a total area of 12,587.28 ha, of which 547.28 ha in the town's intravillaneous and 12,040 ha in the extravillaneous. (SAIDA FEIER DAVID, NICOLETA MATEOC –SÎRB, TEODOR MATEOC, CRISTINA BACĂU, ANIȘOARA DUMA COPCEA, CASIANA MIHUȚ, 2020).

The investigated perimeter is specific to a divagation plain, a subsidence on which soils have been formed and evolved due to its settlement, natural conditions, respectively relief, lithology, hydrology, and vegetation. (L. NIȚĂ, ET. COLAB., 2012; NIȚĂ S., NIȚĂ L., PANAITESCU L., 2015; OKROS ADALBERT, 2015; OKROS ADALBERT, ET COLAB., 2019; MIHUȚ CASIANA, RADULOV ISIDORA, 2012; MIHUȚ CASIANA, OKRÖS A., IORDĂNESCU OLIMPIA, 2012; V.D.MIRCOV, C. MOISE, CODRUTA CHIS, 2015).

The research of eco-pedological conditions was made in accordance with the "methodology for the development of pedological studies" (Vol I, II, III) developed by ICPA Bucharest in 1987, complemented by specific elements in the Romanian soil taxonomy system (SRTS - 2003). (MIHUȚ CASIANA, RADULOV ISIDORA, 2012; MIHUȚ CASIANA, OKRÖS A., IORDĂNESCU OLIMPIA, 2012; V.D.MIRCOV, C. MOISE, CODRUTA CHIS, 2015).

## MATERIAL AND METHODS

Soil was sampled from paedogenetic horizons, both in natural and modified settlement.

Written and drawn materials were used from the OSPA TIMIŞ archives, namely: the pedological and agrochemical study for the achievement/updating of the "national and county land monitoring system for agriculture" at the Banloc Territorial Unit, Timiş County, Romania, at a scale of 1: 10,000.

## RESULTS AND DISCUSSIONS

Within this territory, soil resources have gone through a period of development and different intensification in terms of forming processes, resulting in various types, as well as groups of genetic soil types.

In the extravillaneous of the Commune of Banloc, 8 types of soils were found: chernozems, eutricambosoils, gleysols, solonetz, vertosols, alluviosols (according to SRTS, ICPA, Bucharest, 2012), covering the following areas: chernozems, 1,625.89 ha, i.e., 12.42%, eutricambosoils, 4,755.22 ha representing 36.5%, gleysols, 373.90 ha representing 2.87%, solonetz, 39.08 ha representing 0.37%, vertosols, 2,920.87 ha representing 22.42%, alluviosols, 95.10 ha representing 0.73% and various soil associations, 3,216.6 ha representing 24.69%.

The studied area is 155 ha, and on the ground, the following types of soils have been identified, which are presented in Table 1.

*Table 1.*

The main types of soil (soil map legend according to SRTS 2012)

| Soil Units | Soil Type | Soil Texture (20 cm) | Soil Texture (200 cm) | Relief Forms | Depth of Ground Water (m) | Area (ha) |
|---|---|---|---|---|---|---|
| 18.01 | Typical-phreatic, wet eutricambosoils with medium-sized deposits, medium sandy clay and coarse sandy clay | SM | SG | inter-micro-depression | 2.01-3.00 | 26.2 |
| 26.01 | Moderate-gleyic eutricambosoils, coarse river deposits, average clay | LL | LL | inter-micro-depression | 2.01-3.00 | 35.4 |
| 28.01 | Strong-gleyic eutricambosoils, coarse river deposits, coarse sandy clay or sandy clay argyle | SG | LN | micro-depression | 1.01-2.00 | 93.4 |

Based on creditworthiness indices and according to the methodology, the notes of bonuses were established in the main crops (OR, SO, LU, TR, GP, FS, CT, IV, IF, PB, CN, MF, SF), as well as categories of use (PS, Fn) (Table 2).

*Table 2.*

Soils creditworthiness grades for pasture and hay soils

| TEO | U.S | Area (ha) | PS | FN |
|---|---|---|---|---|
| Eutricambosoils typic | 18.02 | 24.5 | 82 | 73 |
| Eutricambosoils gleyic moderate | 26.02 | 19.25 | 82 | 71 |
| Eutricambosoils gleyic strong | 28.02 | 11 | 67 | 65 |

The first soil unit (18.02) has, as a type of soil, typical wet eutricambosoils and is formed on medium river deposits, medium sandy clay and coarse sand, presents in the first 20 cm an MS texture (medium sandy clay), and in the first 200 cm an SG texture (coarse sandy

clay). The form of relief is inter-micro-depression. The depth of the groundwater is 2.01-3 m. The area covered by this soil unit is 26.2 ha.

The second soil unit (26.02) is moderate eutricambosoils, formed on coarse river deposits, medium clay. In the first 20 cm it presents an LL texture (average clay), like in the first 200 cm. The form of relief is inter-micro-depression. The depth of the groundwater is 2.01-3 m. The area covered by this soil unit is 35.4 ha.

The third unit of soil (28.02), has as a strongly gleyic eutricambosoils, formed on coarse river deposits, coarse sandy clay or sandy clay argyle. The texture in the first 20 cm is SG (coarse sandy clay), and in the first 200 cm, LN (sandy-clay). The shape of relief is represented by micro-depression. The depth of the groundwater is 1.01-2 m, and the area covered by this soil unit is 93.4 ha.

*Table 3.*

Soil suitability for vineyards

| TEO | U.S | Area (ha) | GR | OR | PB | FS |
|---|---|---|---|---|---|---|
| Eutricambosoils typic | 18.02 | 24.5 | 75 | 73 | 90 | 83 |
| Eutricambosoil gleyic moderate | 26.02 | 19.25 | 81 | 72 | 80 | 74 |
| Eutricambosoils gleyic strong | 28.02 | 11 | 53 | 44 | 56 | 51 |

*Table 4.*

Soil suitability for cereals and hoeing crops

| TEO | U.S | Area (ha) | LU | TR | LG | AR |
|---|---|---|---|---|---|---|
| Eutricambosoils typic | 18.02 | 24.5 | 71 | 71 | 90 | 84 |
| Eutricambosoils gleyic moderate | 26.02 | 19.25 | 63 | 73 | 80 | 77 |
| Eutricambosoils gleyic strong | 28.02 | 11 | 34 | 51 | 57 | 56 |

*Table 5.*

|Soil suitability for alfalfa, clover, vegetables and arable

| TEO | U.S | Area (ha) | MR | PR | PN | CV | CS | PC | VV | VM |
|---|---|---|---|---|---|---|---|---|---|---|
| Eutricambosoil typic | 18.02 | 24.5 | 72 | 82 | 80 | 82 | 83 | 82 | 83 | 82 |
| Eutricambosoil gleyic moderate | 26.02 | 19.25 | 71 | 72 | 90 | 80 | 73 | 71 | 73 | 73 |
| Eutricambosoil gleyic strong | 28.02 | 11 | 33 | 44 | 42 | 34 | 34 | 33 | 37 | 33 |

The ARABLE use category has an average weighed area of 55 ha, 65 points, thus framing the area mentioned in the 2nd class (according to Law 16/1996 – Law of land lease, Methodological norms).

## CONCLUSIONS

The Banloc, is located in the southern part of Timiș County, Romania, 50.3 km from Timisoara and 7.5 km from Deta, and consists of the villages Banloc, Ofseniţa, Partoş and Soca. The total area of the commune is 12,587.28 ha, with 547.28 ha of intravillaneous and 12,040 ha extravillaneous.

The soil cover has a high complexity and diversity, where 7 types of soils have been identified: chernozems (1,625.89 ha, 12.42%), eutricambosoils (4,755.22 ha, 36.5%), gleysols (373.90 ha, 2.87%), solonetz (48.20 ha, 0.37%), vertisols (2,920.87 ha 22.42%), alluviosols (95.10 ha, 0.73%) and various soil associations, with 3,216.6 ha, i.e., 24.69% of the surface.

Agricultural land has the following uses: arable 13,028 ha, pastures 1,708 ha, meadows 171 ha and orchards 33 ha.

The main limiting factors are: salt marshing (18.62%), low humus content (0.22%), heavy texture (46.9%), degree of use (20.04%), excess ground moisture (60.95%) and stagnant (36.0%).

The studied area falls into the “arable” use category, obtaining 65 points, falling into the 2nd quality class.

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