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LAND QUALITY LIMITATION IN TIMIS COUNTY, DURING THE LAST 15 YEARS

N.S.Nemeș[1] I.A.Costescu[2] G.N. Pelea[3]

Abstract: The soil's function of amelioration and conservation for a long time and their deterioration decrease are the primordial objectives included in the strategy of Romanian soils protection, amelioration and sustainable usage. For that must be followed a lot of measures that will assure the biodiversity balance, the sources of food and the soils no pollution. Their negative influences are reflected in soil's characteristics and functions decline, respectively in their bioproductiv capacity. To that, in Timis County, the Agrochemical and Pedological Study Office Timisoara annually make an assessment of the lands with different agricultural uses. From these data we found that the soils from Timis County are affected, in a small or a large measure, by one or more restrictive factors.

Keywords: biodiversity, land usage, quality limitation, pedoclimatic conditions, bioproductive capacity.

1. INTRODUCTION

Timis County is predominantly a plain relief (85%), which makes it suitable for various crops. The high degree of agricultural use caused restriction of natural vegetation to small areas, usually used as meadows. Following the concentration of agricultural land and expanding their vast plain area of the county, led not only to reduce spontaneous vegetation, but also change biodiversity and balances between ecosystems (increasing the number of rodents, insects, soil depopulation of frames).

From the data analysis identified by the Agrochemical and Pedological Study Office (OSPA) Timisoara, although the county has an apparently good natural ecological potential, the general situation of soil quality is not satisfactory. This is because most soils are affected by the existence of one or more limiting factors.

The soil's degradation is a consequence of different types of processes, such as: erosion, organic matter decline, salinization, sodization, compaction, landslides, floods or soil sealing.

The data presented in this paper are the result of processing a large volume of inventory studies of degraded lands, based on existing data archive OSPA Timisoara, inventory situation under National Agency for Land Reclamation (ANIF) regarding the situation of land reclamation works and from Department of Agriculture and Rural Development (DADR) Timis.

2. THE QUALITY LIMITATION

To discuss the quality of land in the county of Timis, we presented for the last 15 years, which is the evolution of the distribution of agricultural land by categories of use.

Table 1. The distribution of agricultural land by categories of use, 2000-2006 years

No.	Uses	Surface (ha)						
		2000	2001	2002	2003	2004	2005	2006
1	Arable	529581	532954	532860	533124	532860	532869	532506
2	Grass lands	129609	126150	126152	125875	126152	125720	125656
3	Meadows and natural grass land	29530	29503	29503	29503	29503	29499	29498
4	Grape vine	4314	4314	4314	4313	4314	4310	4354
5	Orchards	9346	9341	9341	9251	9258	9242	9241
Agricultural		702380	702262	702170	702066	702087	701640	701255

[1,2,3] "Politehnica" University of Timişoara, Department of Hydrotechnical Engineering, George Enescu Street, no.1A, Zip code 300022, Timişoara, Romania, e-mail: nicoleta.nemes@upt.ro

Table 2. The distribution of agricultural land by categories of use, 2007-2013 years

No.	Uses	Surface (ha)						
		2007	2008	2009	2010	2011	2012	2013
1	Arable	531373	530481	530375	531593	529240	529242	529242
2	Grass lands	125684	125504	125107	125684	124461	124552	124552
3	Meadows and natural grass land	29497	29482	29481	29497	29535	29535	29535
4	Grape vine	4457	2789	4457	4457	4755	4695	4695
5	Orchards	9466	2975	9202	9246	9058	9119	9119
Agricultural			691231	698622	700477	697049	697143	697143

It is clearly observed that the largest surface have the arable land (an average of 75.93% of the agricultural area of the county), which is determined by dominant plain relief.

In the last 15 years it was observed that the productivity has reduced and quality of grass lands too, because of inadequate management technologies (the surfaces occupied by pastures is 17.98%). Large areas of grassland are invaded with low quality grass plants, toxic, by shrubs and trees. Maintenance, fertilization, etc. are endangered. The decrease in livestock on the grass lands favored the development of herbaceous vegetation, that undeveloped by grazing are lightening it, deliberate or accidental [1].

Surfaces with meadows occupy an area of 29,507 ha and it represents 4.21% of the agricultural area of the county. The areas occupied by meadows are disseminated in the territory with groundwater and rainwater excess, in the plains or valleys of erosion, but also on the slopes of hills [2]. As for the decrease of livestock grazing, important areas of the meadows are annually not harvested.

Surfaces with grape vine occupy 4324 ha and it represents 0.62% of the agricultural area of the county. These areas are grouped in hilly areas (Recas Herneacova, Buzias, Giarmata etc.). Surfaces with vines are located on slopes and for their establishment were made anti-erosion works very expensive (continuous terraces and individual terraces).

Surfaces with orchards occupy an inside surface averaged 8,800 ha and represents 1.26% of the agricultural area of the county. The important fruit growing pools are in the area of Sannicolau Mare, Periam, Buzias.

So while predominantly plain relief would be favorable for varied use of agricultural land, the situation is not very good. Even lands suitable for sustainable agriculture, are actually affected by various degradation processes, which thus limiting the bioproductive capacity, both in terms of quantity and quality.

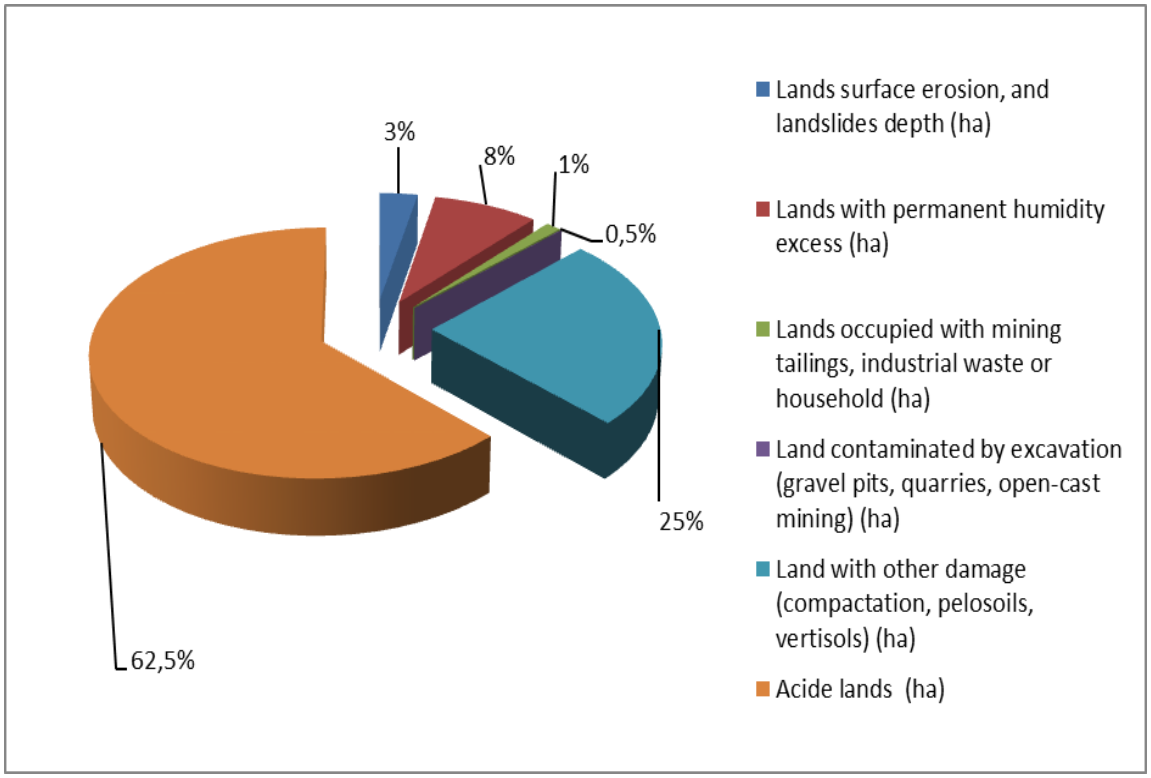

Figure 1. The situation of the land affected by various natural or anthropogenic processes, in 2005 (the total

area identified by OSPA Timisoara)

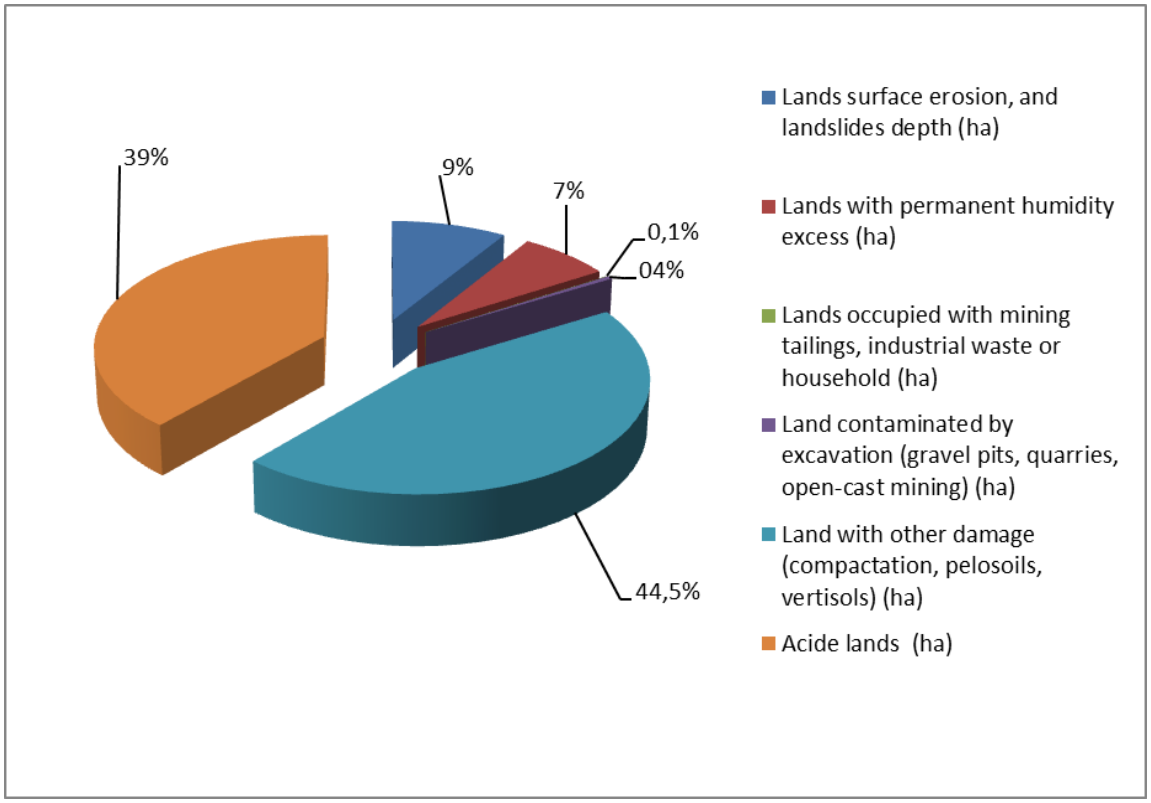

Figure 2. The situation of the land affected by various natural or anthropogenic processes, in 2010 (the total area identified by OSPA Timisoara)

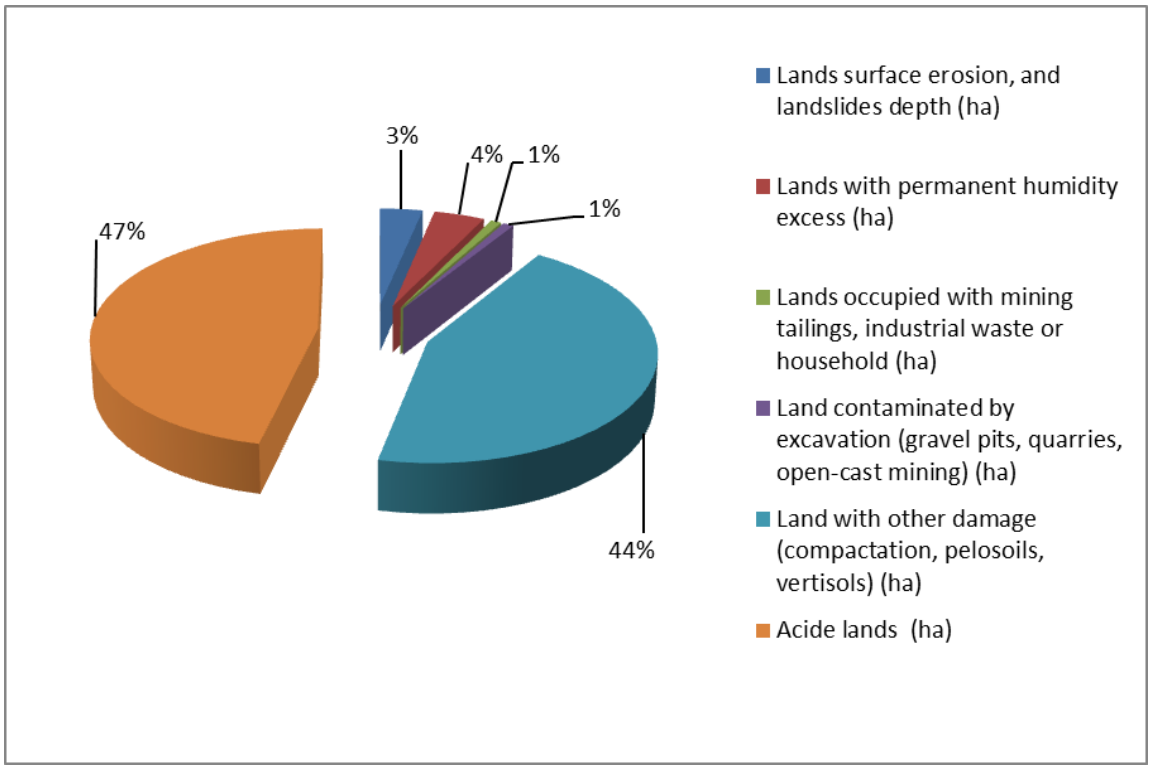

Figure 3. The situation of the land affected by various natural or anthropogenic processes, in 2013 (the total area identified by OSPA Timisoara)

To highlight the main types of land degradation, we performed an analysis of the most common degradation processes for three years during the 15 years analyzed in the paper, respectively 2005 (Fig. 1), 2010 (Fig.2), and 2013 (Fig.3). The results were extrapolated to the entire period taken in the study, as

the data results were similar.

In terms of demand recovery of critical areas of pollution, mention areas affected by chemical pollution (especially acidic land) and high surfaces such as those who suffer from excess water, erosion and landslides which tend to expand under climate change [1].

In this sense, in the year 2008 in Timis County was making a number of projects aimed at ecological reconstruction of the lands:

- Improvement perimeter of agricultural land Ivanda, Giulvaz - with a surface of 90 ha, within which were carried out restoration work of agricultural roads, storm water drains, scarification, insemination of pastures with mixed herbs;
- Improvement perimeter of agricultural land Crai nou, Giulvaz - with a surface of 80 ha, in which the works have been carried out similar to those of the perimeter Ivanda, Giulvaz;
- Improvement perimeter of agricultural land Otelec, Uivar – with a surface of 166 ha, which included works by foreign bodies land clearance and vegetation useless, pastures modeling, scarifying, overseeding;
- Improvement perimeter of agricultural land Herneacova, Lug Stanciova - with a surface of 100 ha, works that including vegetation clearing land worthless, uniformity of the land, modeling, scarification, sowing with mixed herbs, and execution of a drainage channel.

3. CONCLUSIONS

Soil quality is an important indicator to assess the natural potential of land for their rational uses.

In terms of quality, at national level, the soils are affected by various limiting factors, which lower their bioproductive capacity, and subsequently serious consequences on food quality, with influences on the health of the population.

To Timis county level have been identified over the years a number of limitations in terms of soil quality, whether due to natural factors (landform, edaphic characteristics) or human action at agricultural or industrial level (waste storage livestock in inappropriate places, irrational use of fertilizers, etc.).

Significant limitations are:

- limitations due to chemical characteristics of soils: soil acidity - the most common form of degradation in the county;
- limitations due to physical characteristics of the soil: fine texture soils - compactness, rough textured soil - erosion;
- limitations due to erosion or landslides: surface erosion, depth erosion, landslides, downfalls;
- limitations due to excess moisture, be it of excess moisture groundwater (depth) or excess moisture stagnant (surface), flooding the river floods;
- limitations caused by human activity: excavation, pollution.

Reported to the inventoried soil surface or on which were made measurements of the state of quality, the largest area is occupied by acidic soils, followed by compacted soils.

Wet atmospheric deposition of SO_2 and nitrogen oxide (NOx) emissions coming from industrial and vehicular traffic, is the largest source contributing to soil acidification, plus the inappropriate application of fertilizer, topsoil removal, planting vegetation that produce soil acidification.

Another factor that has a huge impact on soil degradation in Timis County is erosion [3]. Natural and anthropogenic erosion are present in the high plains and hills, influenced by slope, hydrological regime, the structure of crops, tillage technology or other human activities such as overgrazing and deforestation.

An important source of soil pollution in Timis County is due to past activities of pig farming in the industrial system by liquid manure storage pits and dehydrated manure deposits in the vicinity of farms. Intensive livestock complexes generated environmental problems because of production, in a small space of high concentrations, of digestive and metabolic waste.

Heavily and excessive affected areas by the pits and quarries, deep water beds causing lowering of the groundwater and hence reductions in water from surrounding areas, but also soil disturbance by deposition of material extracted.

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National Agency for Land Reclamation (ANIF) Timisoara

Department of Agriculture and Rural Development (DADR) Timis

Agrochemical and Pedological Study Office Timisoara