

## PRESSURE HUMAN ACTIVITIES ON ENVIRONMENTAL QUALITY IN DÂMBOVIȚA COUNTY

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### Abstract

*The environment has emerged as a problem of humanity when that increasingly emphasized the contradiction between man and nature, becoming a major problem today, of all mankind. Human activities oriented intensive exploitation of natural resources, affecting ever more state environmental factors. Decades ago, human intervention was less extensive and pronounced streak, because regenerative power of nature. Currently, due to explosive development of industry, agriculture and other activities, aggression on the environmental factors limit exceeded the regeneration of nature, established itself as the context of sustainable development, participation in an increasingly active in protecting environment.*

*The atmosphere is, in fact, most large and unpredictable element in the spread of pollutants, whose effects are felt directly and indirectly to man and the other components of the environment. Therefore, it is necessary to prevent air pollution to be a priority of public interest at local, regional and national. Air pollution, today, is one of the most serious problems of humanity, is manifested both time and space, so no environmental impact to the county covered are not exceptions.*

Keywords: pressure, human activities, pollutants, environment, Dâmbovița.

### 1. INTRODUCTION

Dâmbovița County is located in the Southern Carpathians south to the intersection of parallel of 45<sup>0</sup> north latitude and the meridian of longitude 25<sup>0</sup> east, overlapping Ialomița river basin and the River. With an area of 4054 km<sup>2</sup>, the district is made up of mountains, units transition from the mountains to the hill (Subcarpathians), hills and plains. The county economy characterized by an industrial-agrarian structure, the branch of basic industries with a high degree of diversification. The most representative areas of activity are steel, extractive industries (oil and gas), machine building, chemical, textile and energy. How the location of industrial, in almost all the branches, are located mainly in urban areas, we can say that the main components of the environment (*air, water, soil, vegetation*) are most harmed by the emission of pollutants, or as solid or liquid or gaseous [1;3].

### 2. PRESSURE OF HUMAN ACTIVITY ON AIR QUALITY

Industry is the basic economic branch of the county, having a high degree of diversification.

Manufacturing has the dominant share (80%), and the most representative areas of activity are: metallurgy, mining industry with a long tradition, there scaffold production in Târgoviște, Găești and Moreni, machine building, also represented by enterprises with tradition, textile, chemical industry etc.

Environmental pollution, we can speak of pollution impact in the area analyzed. To this end, air quality data resulting from measurements made Dâmbovița County (obtained from the County Environmental Protection Agency and other official sources), shows particulate matter pollution, especially in Târgoviște area at Doicești and around village, plus pollution particulate sediment in the Fieni. Other atmospheric pollutants releases hydrogen sulfide, the gaseous - sulfur oxides, nitrogen dioxide, volatile organic compounds, heavy metals and noxious exhaust [4;5;8].

*Sources with potential impact at county level are:*

*- The city of Târgoviște and the surrounding area are many and varied including: SC Mechel SA (metallurgy, production of special steels), SC NEMO SA (construction machinery), SC Vicas SA (paints and varnishes), SC Oțelinox SA (processes rolled*

steel), SC Cromsteel SA (chrome processes), SC Erdemir SA, SC ROMLUX SA (lighting), which is added to the sources of domestic heating in cold season of the year, road traffic etc.;

- *In the area Doicești*, emissions of pollutants are produced by work in companies: SC Termoelectrica SA - EU Doicești (major fuel used is coal), SC NUBIOLA SA (cause bleaching agents, chromium oxide green, the main source dioxide sulfur and hydrogen sulfide, compounds resulting from the combustion process of sulfur used as feedstock to produce ultramarine), SC. SOCERAM SA. (producer of bricks and other ceramics; evolve gases, dust, etc.)

- *The city Fieni*, is highlighted as sources of pollutant SC. Carpatcement Holding SA. (producer of cement and construction materials), SC. Carmeuse Holding SA. (producer of lime), SC. Steaua Electrică SA and road traffic.

Beyond industrial production activities, stands and other sources of pollution by harmful impact on air quality, including [1;7]: transport, road transport in this case, their excessive use, especially lately, are a major source of pollutant emissions (exhaust, noise, dust, etc.), all of which contribute to deepening the problem, agriculture has become now, due to the use of inappropriate technologies, a potential source of contamination of the environment, farmers are the main pollutants chemical fertilizers and pesticides, waste, mainly its poor management, among others, are another source of pollution and default adversely affected the health and comfort of the population, especially in urban areas.

Important impact of human activities on the atmosphere is the release of large amounts of gases, including carbon dioxide, methane, water vapor, nitrous oxide, ozone, causing the kind of so-called greenhouse gases [1]. Of these gases, the most important role in air pollution is emissions of carbon dioxide, oxides of nitrogen and methane, resulting from the use of fossil fuels being the main source of growth with 50% of the concentrations of greenhouse gases in the atmosphere. Since

2000, Dâmbovița county level are performed emission inventories of these pollutants by the Environmental Protection Agency (EPA) Dâmbovița [8].

For 2008, at the county level were recorded 2,534,162.526 tonnes CO<sub>2</sub>, N<sub>2</sub>O and 15,670.434 tonnes 137.52 tons CH<sub>4</sub>. The evolution of total annual emissions in tons of CO<sub>2</sub> eq, as a result of emissions of pollutants remember the total inventoried during the years 2000-2008 is shown in fig. 1. From this follows that the largest amount of them was registered in 2000, followed by a sharp decrease, from 47.5% in 2001, the share with small fluctuations from year to year by up to 2006, when it came to 1544.71 thousand tonnes. The interval 2007-2008 is characterized by an upward slope such emissions are increasing by about 50%, coming so at the end of the range, a quantity of 2905.87 thousand tonnes.

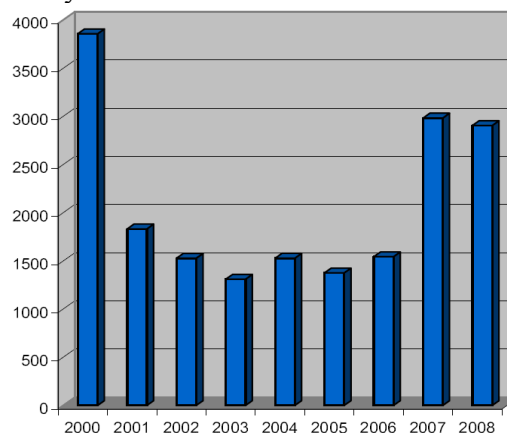


Fig. 1. Total annual emissions of greenhouse gases - CO<sub>2</sub>, eq, in the period 2000-2008

*The energy sector* in the area studied corresponds to the functional group combustion activities in energy and transformation industry. As a major component of economic infrastructure, it is the development of the whole area. From this perspective, sustainable development involves currently meet demand for energy, not by increasing its supply (excluding renewals), but reduce consumption by improving technology, restructuring the economy and changing the mentality on energy efficiency.

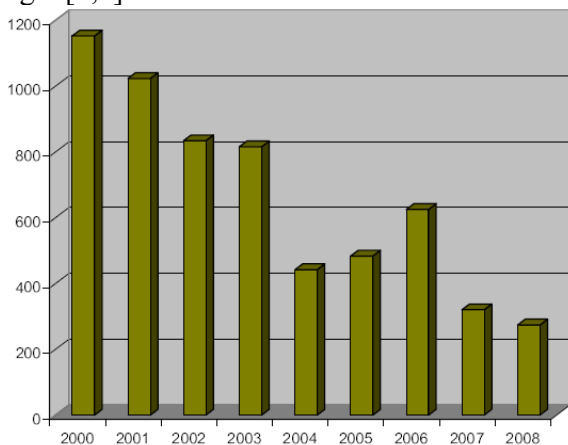
The Dâmbovița County, is the activity energy

companies electricity, energy co-generation, complex micro Hydropower from its rivers and oil extraction industry. Quantities of pollutants emitted into the atmosphere of central Electrothermal Doicești (one of the area) and their share in total emissions are inventoried in the county following table:

**Table 1. Atmospheric emissions from EU Doicești (2008) - comparative study county**

Pollutant	Tons/year		
	Issued by	Issued all county	Given by UE Doicești (%)
Sulphur dioxide	1,778.17	2,341.25	75.95
Nitrogen oxides	191.99	2,400.74	7.99
Carbon dioxide	95,463	253,416.2	3.76
Powders	360.40	6647.37	5.42

The evolution of values over this period, the addition of CO<sub>2</sub>, N<sub>2</sub>O and CH<sub>4</sub>, is shown in fig.2.[5;8].



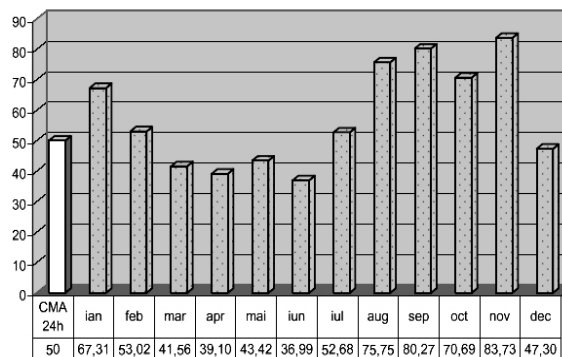
**Fig. 2. Emissions of greenhouse gas emissions as a result of the energy sector in the period 2000-2008**

*Total suspended particulates.* On the pollutant, the average concentrations for 24 hours have exceeded the maximum permissible concentration (MAC) - 50.0 μg/m<sup>3</sup>, values are given in Table 2:

**Table 2**

Sampling point	Nr. overruns / No. measurements	Frequency exceeded CMA/24 h (%)	Maximum average conc./ 24 h (μg/m <sup>3</sup> )	Minimum average conc./ 24 h (μg/m <sup>3</sup> )
Târgoviște	110/197	55,84	144,60	15,70
Doicești	3/200	1,5	0,166	0,011

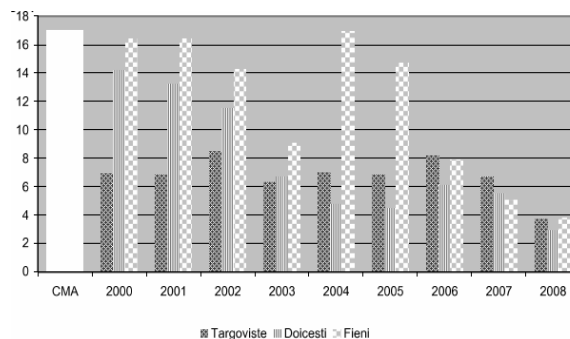
For data analysis shows exceedances of this pollutant (frequency being 6.06% and the maximum recorded 83.73 μg/m<sup>3</sup> (November 2008), in Târgoviște, higher concentration of dust in the atmosphere is influenced by input Retrieved from sources close (construction materials, transport them), changes in monthly average concentrations of particulate matter (PM10) in 2008, is reproduced in Figure 3.



**Fig. 3. Monthly average concentrations of particulate matter in the city of Târgoviște (2008)**

*Fine sediments*

For this indicator, the overall level of pollution of the atmosphere remained constant Doicești area in the city of Târgoviște were no exceedances of the APC (17 g/m<sup>2</sup>/month), while the area Fieni values were high (Fig. 4). Intense pollution in the city of depositing powder Fieni and the surrounding area is due mainly lime kilns and transport processes and processing of limestone from the SC. Carpatcement Holding SA. Dust deletion affects on the one hand, public health, while influencing the normal development of vegetation and crops, but affects the infrastructure of the area said.[5;8;9].



**Fig. 4. The evolution of sedimentary particulate concentrations during 2000-2008 (g/mp/month)**

The gaseous pollutants, ammonia ( $\text{NH}_3$ ) saw an upward trend in recent years, which is due to the increased number of animals, which thus led to increased quantities of the pollutant, from animal droppings, especially in the poultry sector (Fig. 5). On the sources analyzed in Dâmbovița county, it is estimated that over 91% of global ammonia emissions come from agriculture.

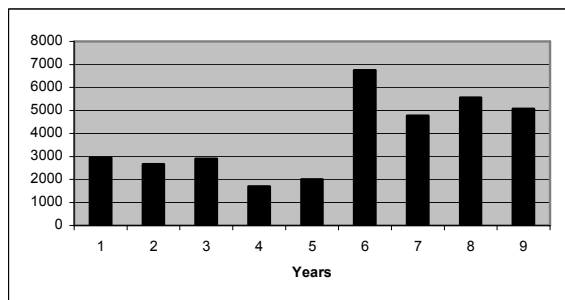


Fig. 5. Evolution of total ammonia emissions in Dâmbovița county (2000-2008)

Given the sources of pollution and their environmental impact at the county level the following critical areas were represented in terms of industrial pollution:

- *Târgoviște area*, characterized predominantly by particulate matter pollution, especially in areas close to SC. Mechel SA, where concentrations remain elevated above acceptable limits for human health protection;
- *Fieni area*, especially the central part of town, where he felt the impact of particulate emissions from depositing SC. Carpatcment Holding SA;
- *Locality Doicești* falling under the EU emissions of particulates, and hydrogen sulfide, from SC. NUBIOLA SA.

### 3. PRESSURE OF HUMAN ACTIVITIES ON WATER QUALITY

In this regard, the district is included in two river basins, namely Buzău - Ialomița and Argeș - Vedea - saw. In general, at the county level may be referred to two categories of impact on the quality of water courses: the product of municipal wastewater (industrial-waste), which mainly affects the Ialomița river - the main recipient of wastewater from

settlements Fieni, Pucioasa, Târgoviște - the River Neajlov - receiver sewage treatment plant in the city Găești, impacts on water courses which cross the area of activity of scaffolding oil are: Răzvad - Moreni - Gura Ocniței (Cricov Pâscov and Cezeanu), Găești (Cobia, Potopu, Strâmbu, Saru), Târgoviște (Slănic and Ilfov). [6;8;9].

For these streams recorded high values over the allowable limits (Table 5), the quality class I (MAC = 50 mg / l) the parameters chlorides and oil products, the main cause is the impact of technological water leakage and the deposit of the scaffolding Petroleum said.

Table 3. Mean values of exceeding the MAC (50 mg / l) in the indicator *chlorides*

River	Semester I/year	Chlorides
Cezeanu	2008	2355.58
	2009	433.52
Cobia	2008	161.02
	2009	2012.126
Cricov	2008	447.82
	2009	151.39
Ilfov	2008	90.83
	2009	161.44
Pâscov	2008	1693.89
	2009	371.59
Saru	2008	4128.85
	2009	1037.71
Slănic	2008	1521.58
	2009	818.74
Strâmbu	2008	894.58
	2009	1307.46

Problems of pollution of watercourses from point and diffuse sources, with organic and decomposition products, due to discharges of wastewater from municipal sewage plants, is found, the tests performed, and the following arteries basin: *Ialomița river*, where there were exceedances of the Ammonium CMA (0.4 mg / l for class quality), average values of the first semester of 2009 was 0.93 mg / l to 0.89 mg / l in the same period in 2008; *Cricov river*, where it felt the impact of wastewater discharges from sewage plants in the locations and IL Caragiale Moreni and pollution with organic and domestic waste, as indicators exceedances COO-Mn, chlorides, phosphorus and iron.

Also, the area is evident and one other of the components of environmental pollution (water), the phenomenon of salted, persistent. Moreover, the existing groundwater. A special case is the common Bucşani, where in 2008 and 2009 there were large excesses of CMA (250 mg / l) ranging from 634 mg / l and that 649 mg / l, the chloride (Fig. 6).

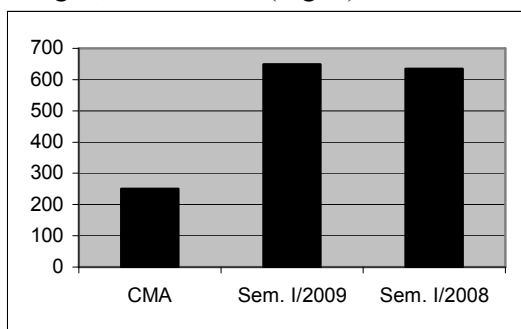


Fig. 6. Media concentration of chlorides in the years 2008/2009 - Bucşani area groundwater

#### 4. PRESSURE OF THE HUMAN ACTIVITIES ON SOIL QUALITY

Soil quality is affected in varying degrees, by various factors, exerting their influence in the deterioration of the characteristics and functions, namely the ability of bio-productive and, especially, in affecting agricultural and food security, with sometimes serious consequences on the quality General human life.[1;8].

The main causes of soil pollution in the county are determined by the activities of the oil industry and the poor storage of solid waste in or near the industrial premises.

In this respect, are important deposits of ash, slag, sterile, the slam oil, but also careers serving the following companies: Mechel Târgovişte SA (the slag dumps from Udreşti and Lucieni) Carbonifera SA Ploieşti (working point to Şotânga, waste dumps in his career and Cărbunaru Dealu Mărgineanca) Carpatciment Holding SA Fieni (careers from Pucioasa, Malu Roşu and flagstones), Termoelectrica SA - Doiceşti (two deposits of slag and ash in Poiana Mare and Teiş), Erdemir SA (with a settling pond and landfill), OMV - Petrom SA

(Slam oil deposits) and ELSID SA Titu (landfill coke).

Also included in the categories of soil degradation are other sources, including: *assets of land subsidence, erosion of surface and deep, sandy soils are exposed due to wind or water erosion and land areas with excess moisture.*

In the year 2008, Dâmboviţa County were inventoried 277 acres of land through degradation, have lost all or part of agricultural production capacity. They have set up perimeters for improvement, as required by law (Table 6).

Table 6. Perimeters of degraded land improvement

The perimeter of improvement	Surface (ha)	Land use category	Nature degradation	Necessary improvement works
Râul Alb	50	Pasture	Excessive erosion of surface and deep excess moisture	Leveling, shaping, anti-erosion works, drainage, etc.
Malu cu Flori	45			
Glodeni	50			
Brăneşti	35			
Bezdead	40			
Bărbuleţu	57			

Accidental pollution is found that the most intense soil occurs in areas with industrial activities, mainly oil and mining. Most cases occurred in villages Moreni, mouth Ocniţei, Bucşani, Răzvad, Cobia, Şotânga, etc. Predominant character of the district cereal trigger the extensive use of fertilizers and pesticides, they are another source of pollution of land. The most likely land in the villages are located in the Carpathian foothills, where groves of fruit trees predominate (Voineşti, Gemenea, Măneşti, Căndeşti, etc.), or those of the plain (Băleni, Lunguleţu, Comişani, Văcăreşti etc.), where predominantly grown cereals and vegetables of.

#### 5. DIRECTIONS FOR ENVIRONMENTAL MANAGEMENT IN DÂMBOVIŢA COUNTY

Environmental policy-targeted profile such as its protection and enhancement of quality, public health protection, rational use of natural resources is also promoting measures at

European level on environmental problems through international involvement.[2;8].

In this regard, Dâmbovița County have been completed or are ongoing projects that have targeted the improvement and modernization of sewage networks and water supply, sewage stations, control and reduce air pollution, water and soil by introduction and use of improved technologies.

Total expenditure for environmental investments and in sem. I/2009, was 4,468,146 RON, a sum far greater than in 2008 (61.390 RON). The largest investment projects were conducted by SC. Petrom SA, regarding the control of environmental pollution.[8].

## 6. CONCLUSIONS

Regarding the pressure of human activities on environmental quality in River County, with special reference to its main components, we can summarize the following:

- Overall, Dâmbovița County is found to maintain or decrease the frequency and the threshold is exceeded the limit value permissible concentration values for all indicators monitored monthly average, compared with previously collected data. The arrival of automatic monitoring stations in Târgoviște and Fieni improved oversight of air quality in these localities.

- Regarding water quality, some of the rivers that cross the county have problems with pollution and decomposition of organic matter due to the discharge of wastewater, insufficiently treated, the urban stations that are intended for this activity. River water is affected mainly by oil scaffolding work, which frequently recorded exceedances of the CMA on class quality.

- An important role in deterioration of soil quality status we have oil exploitation, the coal or other mineral substances useful as the occupation of land by mining dumps, industrial waste or household waste, and fertilizers and pesticides.

## 7. REFERENCES

- [1] Bălțeanu Dan, Modificările globale ale mediului. O evaluare interdisciplinară a incertitudinilor, Editura Coresi, București, 2005.
- [2] Gâștescu P., Managementul mediului, Editura Sfinx 2000, Târgoviște, 2001.
- [3] Pehoiu Gica, Cristina Muică, Mihaela Sencovici, Geografia mediului cu elemente de ecologie, Ed. Transversal, Târgoviște, 2006.
- [4] Pehoiu Gica, The impact of human activities on environmental quality in Dâmbovița county, în vol. 2, „Present Environment and Sustainable Development”, Ed. Universității „Alexandru Ioan Cuza”, Iași, 2008.
- [5] Pehoiu Gica, Actual aspects related to the quality of the air in the county Dâmbovița, in report with the status of health of the population, vol. lucrărilor Simpozionului Internațional Multidisciplinar „Universitaira Sempro 2006” - „Ingineria mediului”, Ed. Universitas, Petroșani.
- [6] Pehoiu Gica, Câmpia Înaltă a Târgoviștei. Studiu de geografie umană și economică, Editura Cetatea de Scaun, Târgoviște, 2003.
- [7] Ungureanu Irina, Geografia mediului, Ed. Universității „Al. I. Cuza”, Iași, 2005.
- [8]\*\* Raport privind starea mediului în județul Dâmbovița (2000-2008), Agenția pentru Protecția Mediului - Dâmbovița.
- [9]\*\*\*, Anuarul statistic al județului Dâmbovița (2000-2008).