

GENERAL CONSIDERATIONS RELATED TO THE QUALITY OF THE SURFACE WATERS FROM THE BIHOR-HAJDU-BIHAR EUROREGION

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Abstract

Water is a very important factor in the ecological balance and its pollution is a current problem with more or less serious consequences upon the population. By water pollution we understand an alteration of the physical, chemical and biological features of the water, alteration produced directly or indirectly by human actions and which makes water be unable to be used properly for what it had used to serve before alteration had occurred. The effects of the water resource pollution are diverse and complex according to the nature and the concentration of the altering substances.

Key words: water pollution, pollution sources, the quality category of the waters.

INTRODUCTION

A water is considered polluted when its physical estate, its composition or even its aspect are modified directly or indirectly by the actions of people in such a way that it can not be used in its natural estate anymore. Pollution is the action by which water is charged with strange substances that damage life. Water modifies its composition when it contains foreign elements that harm plant and animals (Kerenyi, A. 1995).

Among the sources of pollution, the industrial one is the most aggressive. The most polluting ones are the chemical and the food industry. Slaughterhouses use an average of 500 liters of water for each sacrificed animal, water which is later discharged in the environment. In developed countries the food industry produces 20-25 % of the whole pollution and the chemical industry produces 30 % of it, discharging the most varied toxic chemical substances and sometimes producing extremely serious pollution if the waters are not purified before being discharged.

Refineries and usually the oil and chemical industry spread carbonhydrates and the oil layer stops the oxygen filling and unbalances the self purification of the waters. These industries also discharge hot and warm waters thus producing a thermic pollution. Agricultural pollution is produced by pesticides, chemical fertilizers and animal droppings. Pesticides are used to destroy the activity of the harmful insects, of rodents, of fungi, etc. Some of these substances deteriorate slowly, accumulating themselves in some plants or in the animals that humans eat. Some chemical fertilizers can be very harmful: for example, nitrates in excess can combine themselves with the fermentating organic substances producing nitrates that destroy the aquatic fauna (Zamfir, Gh., 1975).

Urban pollution manifests itself by discharging the running waters through sewers in rivers or in oceans or by being infiltrated in the phreatic net. The canals collect the content of the sanitary installations, of the kitchens filled with organic residues, with pathogen bacteria, with detergents.

The density of the hydrographic net in the west part of the Euroregion, meaning in the Hajdú-Bihar county is lower in comparison with the east part. The most important waters flows in the Euroregion are: Tisa, Barcău, Hortobágy, Kösely, Kondoros, Ierul, Crișul Repede, Peța, Crișul Negru, etc. (Ambrus, L., A., 2009)

MATERIAL AND METHODS

The main notions and data analyzed in this work result after a very rich bibliographical source related to the Bihar-Hajdu-Bihar Euroregion as well as by processing and interpreting the information from the Debrecen Environment Protection Agency (TIKOFÉ) and from the Oradea Environment Protection Agency. The information is presented in Table 1 and in Table 2 as follows:

Table 1.

Sources of pollution of the surface waters in the Hajdú-Bihar county

Criterial no.	Name of the company	Profile
1.	Petisfood Kft Debrecen,	Pig farm
2.	Atev Debrecen-Bánk,	Animal waste warehouse
3.	R-KO-N Balmazújváros, Húsipari Kft,	Slaughterhouse and meat processing
4.	Hajdú-Berstahl Fémipari Kft,	Metal industry
5.	Márvavéd Kft Püspökladány,	Rail hub, workshop
6.	Sellaton Bútorgyár Rt. Debrecen,	Furniture plant
7.	Deko-Food Rt.,	Food products
8.	ICN Rt. Tiszavasvári,	Drug/medicine plant
9.	Agroferm Rt. Kaba,	Metal industry
10.	MOL Ebes Bázistelep,	Oil products
11.	Dispomedicor Rt., Debrecen,	Medical equipment
12.	Kabai Cukorgyár Rt.,	Sugar factory
13.	Hajdútej Rt. Hajdúböszörményi Sajtüzem,	Dairy products
14.	Hajdútej Tejipari Rt Debreceni Tejüzem,	Dairy products
15.	Debreceni Gyógyfürdő Kft,	Swimming pool
16.	Daewoo MGM Rt. Debrecen,	Car factory
17.	Mol RT. Hajdúszoboszló, Telephely,	Oil products
18.	Jet üzemanyagkút,	Oil products
19.	Hajdúszoboszlói Közütemi Kft,	Purification plant
20.	Nagév Tiszacsege Tüzi- horganyzó Üzem,	Metal industry
21.	Váncsod Konzervüzem,	Cannery
22.	Magyar Járőtechnika Rt.,	Car part plant
23.	Mol Földgázszállító Rt. Hszoboszló,	Oil products
24.	Kenézy Gyula Kórház Debrecen,	Hospitals
25.	Hage Nádudvar sertéstelep,	Pig farm
26.	Hage Kaba sertéstelep,	Pig farm
27.	Elektro-galván Bt. Pladány,	Chemical industry
28.	Rewox Kft Hnánás OMW üz. kút.,	Oil products
29.	Területi Kórház Bujfalu,	Hospitals
30.	Földes szennyvíztelep,	Purification plant
31.	Term-Co Földes konzervüzem,	Food industry
32.	Hajdúszoboszló gyógyfürdő,	Swimming pool
33.	Székát VH. lerakó telep,	Landfill

Table 2

Sources of water surface pollution in Bihor county

Criteria no.	Name of the company	Profile
1.	CET I ₂ (II) – ash dump	Heat and electricity
2.	ALUMINA-ALOR	Alumina production (currently disposed)
3.	Mining association MINWEST- Dobrești	Underground bauxite mining exploitation
4.	CNU. București-Suc. Stei, IFIN – București – Băița	The national radioactive waste warehouse (till 2010)
5.	SC PETROLSUB SA. -Suplacu de Barcău	Oil refinery
6.	SC. PETROL–Derna	Raw oil refinery
7.	SC. SINTOMEC SA.	Chemical profile activities
8.	SC. Pigmenti SA.- ORADEA	Chemical profile activities
9.	SC.PETROM SA.- Suplacu de Barcău	Oil profile activities
10.	SC. CHIMPROD SA.-Oradea	Chemical profile activities
11.	SC.SIMCOR S.A.- Oradea	Building materials
12.	LUSO- Oradea(it had been closed meanwhile)- milk factory	Dairy products
13.	ALFA- Oradea – furniture factory	Chemical profile activities
14.	SC. ZAHARUL Oradea – Sugar factory	Food industry
15.	FABRICA DE ULEI(closed in 2007)- Oradea-Oil factory	Food industry
16.	TĂBĂCĂRIA- Oradea-Tannery	Chemical profile activities
17.	COMINCA- Oradea	Chemical profile activities
18.	PECO Oradea-gas station	Oil products
19.	Swimming pools - Oradea, FELIX, 1 MAI, Marghita, Tinca etc.	Touristic spa
20.	Purification plant-Oradea	Purification, filtration, selection and storage
21.	Landfill- Oradea	Waste warehouse

After consulting the data for the period 2005-2010, the main sources of pollution of the waters from the Bihor- Hajdu-Bihar Euroregion rise up to a number of 33 in hajdu-Bihar and to a number of 21 in Bihor county so, to a total of 54 sources within the Euroregion.

On the following map we have marked the localities that contribute with a high percentage to the water pollution, localities with a lot of industrial functions (fig. 1.)

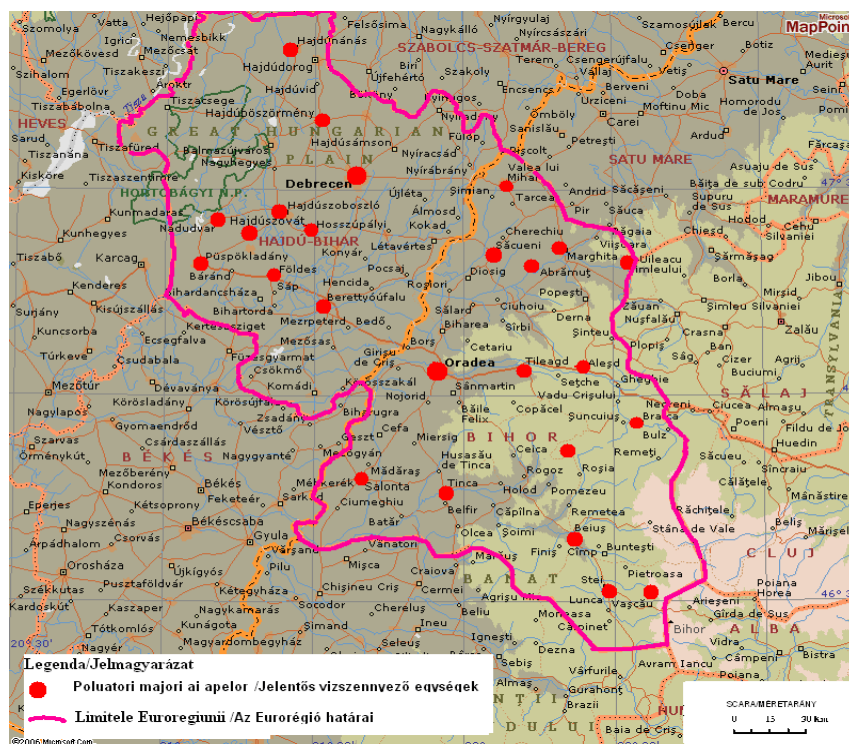


Fig. 1 Major sources of pollution in the Bihor-Hajdú-Bihar Euroregion

One can notice a rise of the polluting units from the east to the west, these sources being more in number in the field areas and fewer and fewer in the hill and mountain areas, except the highly industrialized or mining areas.

RESULTS AND DISCUSSION

In the present work, the monitored and analyzed polluting factors for the Euroregion were: NH_4 (ammonium), NO_2 (nitrites), NO_3 (nitrates), as well as some indicators like the value of the PH, the quantity of the solved oxygen, etc. And except these, for some of the rivers in Bihor county other indicators or chemical polluting factors had been analyzed. As a consequence it had been difficult to create a parallel of all the toxic factors from the waters in the two counties due to a different monitoring and to the lack of some of the observation data (Ambrus, L., A., 2010).

On the basis of the analyzed data we have realized a map that shows as accurately as possible the quality categories of the rivers in the Euroregion, with the help of fig. 2.

The quality category of the surface waters from the Euroregion is presented in fig. number 2, where we can notice that a great part of the surface waters from the Euroregion belong to the second category of quality, like the following rivers: Tisa, The Hortobágy Sewer, Tóció, The Sárret Sewer, Ier, Barcau, The Quick River (Crisul Repede) downstream Oradea, Crișul Negru- The Black River, downstream Beiuș.

CONCLUSIONS

As a conclusion, the estate of the environment in the Bihor-Hajdu-Bihar Euroregion is a resembling one in the sense that it registers the local type of pollution coming from the existent industry. The most polluting sectors are those due to the mining and oil exploitations, to the chemical industry, to the wood and paper processing, to the metal industry, to the electrotechincal industry, to the concrete industry, to the transport, to the agriculture, to the municipal management, to the power system industry, etc.

The quality of the waters has improved due to the decrease of the social economical activities and to the application of the different norms and laws. The surface waters existent in the studied Euroregion are almost all of the first and second quality category (waters that can be drunk and consumed by animals and by the population).

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