

ENVIRONMENTAL PROTECTION MANAGEMENT BY MONITORING THE SURFACE WATER QUALITY IN SEMENIC AREA

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Key words: water, quality, Semenic, environment.

ABSTRACT:

Environment seems to have been the war against all. In fact recently most people polluted the environment and those few are cared for his cleaning. Today, the relationship evolved as societies have changed in favour of ensuring environmental protection. With modern technology, performance, monitoring the environment becomes part of human activity ever more necessary, more possible and more efficient. The quality of the environment, its components: air, water, soil, plants, vegetable and animal products, is a condition "sine qua non" for the life of the modern man. The consequences of environmental pollution are so dangerous that modern man cannot afford considering them. Through this paper I will study the environmental quality by monitoring the surfaces waters from the Semenic-Gârâna area.

Introduction

Semenic resort is in Caras-Severin County, and belongs to the Semenic Mountains which are part of the southern group of Western Carpathians, culminating with Piatra Goznei Peak (1447 m) and Semenic Peak (1445 m). This is an important hydrographical node – “the water castle of Banat ”- from which Timis, Nera, Barzava spring. This whole mountain aggregate forms a major tourist area, where one can practice a complex tourism.

Agricultural production is characterized by a high pollutant potential, resulted in the nature of the production processes used to enhance production and growth of the volume of agricultural products for consumption. In this paper we followed the amount of the ammonium, nitrites and nitrates from the waters in the researched area. We all know that if the water is polluted we cannot drink it, and we also know that it is cheaper to prevent than to treat.

Materials and methods

Territorial and geographical location for this study of the drawing points

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of surface water in order to make laboratory tests was conducted in three locations namely Garana, Văliug and Semenici.

As the hydrostatic parameter is variable depending on time parameter it is necessary to collect water samples at different times of the year, and thus it can be captured the dynamics of concentration variation in the various salts which give groundwater salinity content. The establishment schedule to collect water sampling was done according to the calendar period, rainfall and temperature factor regime. So water samples were collected four times in 2010 respectively January, April, September and December.

Transport of samples, under conditions of adequate insulation, to the chemical analysis laboratory of the *Faculty of Horticulture and Forestry USAMVB Timisoara* and the analysis regarding the polluting factors NH_4^+ , NO_3^- and NO_2^- and pesticides.

Collection and storage of water samples were collected in accordance with ISO 5667-10, ISO 2852, from the surface and deep waters from village wells. Water samples were collected in plastic containers or glass of about one liter. Before use the containers were washed with nitric acid diluted with distilled water and then rinsed with water for analysis. The method used is the spectrophotometric method for determining ammonium *Spectroquant Ammonium Merck 14,752*. The content of nitrate, nitrite and ammonium was determined colorimetrically using rapid tests *Aqua Merck*, the SQ 118 spectrophotometer at wavelengths: 515, 525 and 690 nm for nitrate, nitrite and respectively ammonium.

Results and discussions. But even in the mountain areas the pollutant potential increased. Semenici plateau has an inherent characteristic, less common in other mountainous ranges. Semenici plateau is barren, with a low level of forestation in the highlands. The place of the forest was taken by meadows and alpine meadows, which give the plateau a special characteristic.

Under these conditions, there are mountain villages located at high altitudes such as Garana, which is located at about 1100 m. The extension of inhabited hearths at such altitudes entailed the development of livestock production, especially cattle and sheep industry. In this context, it was mandatory to improve the quality and quantity of plant mass obtained from natural grasslands. This objective can be achieved through increased production in these utilities, especially by increasing the amounts of fertilizer factors. We refer here to the chemicals, especially chemical fertilizers, which are characterized by a high pollutant potential. Water is certainly the most important of these components because of the great dispersal capabilities in the territory of the results of polluting factors.

In the alpine area of Semenici plateau there is the lake "Trei ape" which is fueled by a series of streams that collect their water from the surrounding slopes, and in the subalpine area of the Semenici plateau there is Văliug Lake. On the northwestern slope of the Semenici plateau is the retention basin of the river Bârzava, which together with the Văliug Lake ensure Resita's water consumption. In these conditions it is understood why it's necessary the development and use of codes of good agricultural practices, which must be at hand of any agricultural producer, and that should clearly show, using friendly methods and practices to

the environment, the ways of reducing pollution and degradation of water and soil quality, of achieving a livestock production under conditions of maximum environmental protection.

One of the most important goals of the code of good agricultural practices is to ensure protection of water, an essential element of any life forms, whose properties ensure the quality of agricultural products, but at the same time, it is vulnerable to agricultural activities in all branches and agricultural production areas.

In general, deep water contains ammonia. Instead, surface waters are under direct and immediate effect of ammonia from the decomposition of organic matter or manure. Of particular importance is rainfall, which may have a dual role. Surface rainfall creates leaks that could lead to soluble products of ammonia or even organic sources from which it can be derived to natural water courses which are taken by the collector river and brought to final discharge into the sea.

For this set of tests, water samples were collected from surface water sources. In Tables 1, 2 and 3 will be presented the results of tests carried out during 2010. As we can see in the following tables, neither ammonium, nitrites nor nitrates did exceed the maximum accepted limit. Although for nitrates there were some big values, we can say that the water is not polluted, and it is safe for the people and not only. The highest results were registered in April, in all three researched areas.

Table 1. The results concerning the content of ammonium, nitrites and nitrates from Semenic area.

Content	January	April	September	December
Ammonium 0,50mg/l	0.09	0.14	0.10	0.10
Nitrites 0,50mg/l	0.06	0.10	0.10	0.04
Nitrates 50 mg/l	24.1	26.4	20.0	19.1

Table 2. The results concerning the content of ammonium, nitrites and nitrates from Gărăna area.

Content	January	April	September	December
Ammonium 0,50mg/l	0.10	0.19	0.18	0.20
Nitrites 0,50mg/l	0.09	0.10	0.08	0.08
Nitrates 50 mg/l	30.4	31.1	24.6	25.0

Table 3. The results concerning the content of ammonium, nitrites and nitrates from Văliug area.

Content	January	April	September	December
Ammonium 0,50mg/l	0.02	0.04	0.03	0.03
Nitrites 0,50mg/l	0.05	0.5	0.02	0.03
Nitrates 50 mg/l	15.4	16.0	12.9	12.0

Conclusions

After the researches were done in the field and in laboratory, after reading the specialty books, national or foreign, we can draw the following conclusions:

1. We can notice that the biggest values registered were in April, when the quantity of the precipitations is the highest.
2. No matter the location, the content of ammonium, nitrites and nitrates don't exceed the maximum admitted limit.
3. In the studied territory the surface waters can be used as potable water sources, with the condition to respect the other chemical compositions norms.
4. In the area the tourism can be practiced, because the water has no danger either for the people, animals or flora.

REFERENCES

- Alexa E., Finichiu M. (1984), *Poluarea biologică a surselor de apă*, Consfătuirea de specialitate Bacău, USSM filialele Bacău și Iași.
- Alexa E. (2003), *Pesticide și remanența lor*, Ed. Eurobit, Timișoara.
- Berca M. (1985), *Relațiile dintre erbicide și mediul înconjurător*, Ed. Ceres, București.
- Cuc L. (2006), *Ecologia apei*, Editura Eurobit, Timișoara.
- Sâmbotin L. (1999), *Managementul exploatațiilor agricole*, Ed. Mirton, Timișoara.
- *** (1983), *Geografia României*, Vol. I, Editura Academiei București.
- *** <http://europa.eu.int/comm/environment.html> - Pagina web a Directoratului General Pentru Mediu al Comisiei Europene.
- *** STAS 4706/1988 – *Ape de suprafață. Categori și condiții tehnice de calitate.*
- *** SR 1343-1/2006 – *Alimentări cu apă potabilă pentru localități urbane și rurale.*
- *** SR 3048-2/1996 – *Apă potabilă. Determinarea conținutului de nitriți. Metoda prin spectrometrie de absorbție moleculară. Standard de stat. Consiliul Național pentru Știință și Tehnologie*, Institutul Român de Standardizare.