

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

Dana SÂMBOTIN, Ana Mariana DINCU, Adrian COROIAN, Mihaela PĂTRĂȘCOIU

Research group: Banat University of Agricultural Sciences and Veterinary Medicine

Timișoara

Romania

e-mail: dana82tm@yahoo.com

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, it's 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. Water, a basic element of life on our planet, has a dynamic circuit that leads to renewal and refreshing the natural water reserves. Through this paper I study the environmental quality by monitoring the shallow waters from the Semenic – Gărâna 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 area that we researched. We all know that if the waters are 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 of surface water in order to make laboratory tests was conducted in three locations namely Garana, Valiug and Semenic.

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 pollutants 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

Most of the EU population has access to clean water in abundant quantities, but they don't realize that many of their activities pollute water, damaging the environment and even their health. All polluted water, either in households, industry or agriculture return, one way or another, into nature, polluting the environment. Even in the mountain areas the pollutant potential increased. Semenic plateau has an inherent characteristic, less common in other mountainous ranges. Semenic 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 Semenic 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 Semenic plateau there is Văliug Lake. On the northwestern slope of the Semenic 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 is 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.

It is well known that environmental protection, therefore water, is expensive and water remediation costs are much higher than if we prevented it in the first place the contamination. Groundwater quality is very good, as it filters through the soil, but it is generally found in small quantities, and can only serve for small communities; in addition it has a very low self-purification capacity.

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 not 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 areas researched.

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

Semenic	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 Gărâna area

Gărâna	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

Văliug	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 shallow 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.
5. We must take good care of the environment and of the waters, it is cheaper to prevent than to treat and this is a thing that the next generation is going to inherit from us.

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