


Monitoring of Water Quality in Lake Radoniqi			Environment and Ecology
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Xhelal Këpuska		Regional Water Company “Radoniq” in Gjakova, Kosovo.	
Luan Daija		Regional Water Company “Radoniq” in Gjakova, Kosovo.	
Ilir Kristo		Agricultural University of Tirana, Department of Environment and Ecology, Tirana, Albania.	
Abstract			
<p>The purpose of this research is to monitor water quality in Lake Radoniq through physical, chemical parameters which is very important for determining the environmental condition of the water in the lake and helps in determining the source of water pollution. During this research which was done in 2011 and 2012 in Lake Radoniq analyzed these chemical parameters: temperature, turbidity, pH value, electrical conductivity, nitrites, expense KMnO₄, phosphates, etc. From the results obtained during the analysis of water, recorded an increase of some chemical parameters such as turbidity, nitrites, expense KMnO₄, this is the result of large flows of water and soil erosion from rainfall and snow melt. Taken as a whole lake water quality is good, but since the water after treatment is used for human consumption, is required to monitor continuously water quality. In statements are given values of measurements nefelerometrike siltation which vary from 1.05 in august to 3.05 NTU in December the concentration of nitrites in the water of the lake varies from 0.003 mg / l in September to 0.0072 mg / l in June, this happens due to the discharge of rainfall and erosion where we are to carry on the lake waste significant amounts of organic matter, clay and other solid materials.</p>			

1. Introduction

Water is a natural resource with limited and uneven distribution in time and space. All forms of life and all human activities are dependent on water. Water resources are of great importance to human life and economy and are the main source of meeting the demand for drinking water, for irrigation of lands and industries. Lack of water is considered as a limiting factor of socio-economic development of a country.

Modern industrial development and urbanization have resulted in the formation of large urban areas, industrial zones and the development of intensive agriculture. This has increased the need for water, but also the growth of urban and industrial discharges into rivers without any prior treatment, thereby reducing the possibility of self-purification (auto purification) of water.

The need for clean water, today is considered as one of the biggest problems the global environment. Currently, more than 1.2 billion people worldwide have no access to drinking water while some 3 billion people (half the world's population) do not have adequate sanitation services. More than 200 diseases are originating from contaminated water and about 6,000 people a day lose their lives just by diarrheic diseases.

According to the World Health Organization, an estimated 5 million people die each year from the consumption of contaminated water. Considering the current trend of urbanization in the world by 2025, nearly 3 billion people will need water supply and more than 4 billion for access to sanitation. In Kosovo, as in many countries, human health and meeting their needs is increasingly threatened by the poor quality or lack of clean water.

2. Methods

With goal to define physical-chemical parameters in water of Lake "Radoniq", many analyzes has been done. Samples of water are tested in laboratory inorganic analytical in filtering station and also in analytical chemistry laboratory near Faculty of Education in Gjakova. For this goal are done methods like: Atomic Absorption Spectrometry AAS, Perkin Elmer, Merck Photometer NOVA 60, also methods titrimetric etc. Samples of water are taken in bottle of 1000 ml, bottle was from polyethylene well cleaned, transport and storage of samples are done with little refrigerator for saving temperature between 4-7°C.

Samples of water are brought immediately in laboratory to analyze. The physical parameters that has been analyzed are: Temperature, Turbidity, Value of pH, Electrical conductivity, expens KMnO_4 , nitrites, phosphates. Parameters has been rated in the place where samples has been taken through mobile device.

3. Results

Table 1. The values of the physical parameters of water quality in the Lake "Radoniq"

2011	Temperature °C	Turbidity Ntu	pH	Conductivity $\mu\text{S}/\text{cm}^2$
Stand		ISO7027:1999	ISO10523:2008	ISO 27888:1985
Jan	5.8	3.0	7.7	188
Feb	6.6	2.88	7.6	177
Mar	6.9	3.02	7.58	166
Apr	7.2	2.27	7.71	159
Maj	8.5	2.15	7.70	164
Jun	9.9	2.3	7.66	172
Jul	11.5	1.19	7.7	168
Avg	12.3	1.08	7.52	178
Sep	11.7	2.05	7.62	176
Oct	11.4	2.6	7.66	174
Nov	9.6	2.58	7.50	160
Dec	8.2	3.05	7.61	161

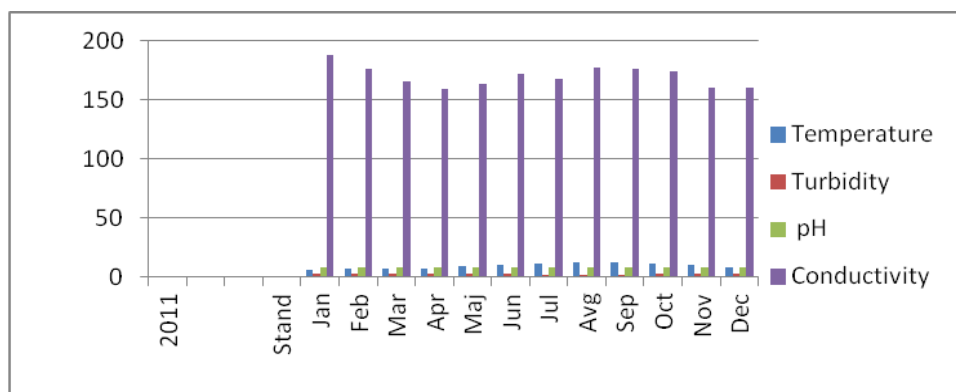


Figure 1. Physical parameters of water quality in the Lake "Radoniq"

Table 2 The values of the Chemical parameters of water quality in the Lake "Radoniq"

2011	Total Hardness ° dH	Chlorides Cl ⁻ mg/l ¹	Nitrites NO ₂ ⁻ mg/l	Expense KMnO4 mg/l	Phosphates PO ₄ mg/l
Stand	ISO6059:1984	ISO9297:1989	ISO 6777:1984	ISO 8467:1993	ISO6878:2004
Jan	7.28	5.25	0.006	5.42	0.052
Feb	7.14	4.02	0.0052	5.12	0.007
Mar	7.28	3.89	0.006	4.74	0.055
Apr	7.14	3.89	0.007	6.0	0.06
Maj	7.28	4.25	0.008	7.25	0.04
Jun	7.0	3.89	0.0072	6.27	<0.05
Jul	7.14	3.54	0.004	3.79	0.052
Avg	7.0	3.54	0.0025	4.25	0.06
Sep	7.28	3.89	0.003	3.79	<0.05
Oct	7.14	3.54	0.004	4.74	0.07
Nov	7.28	3.89	0.003	3.47	<0.05
Dec	7.0	3.89	0.003	4.74	<0.05

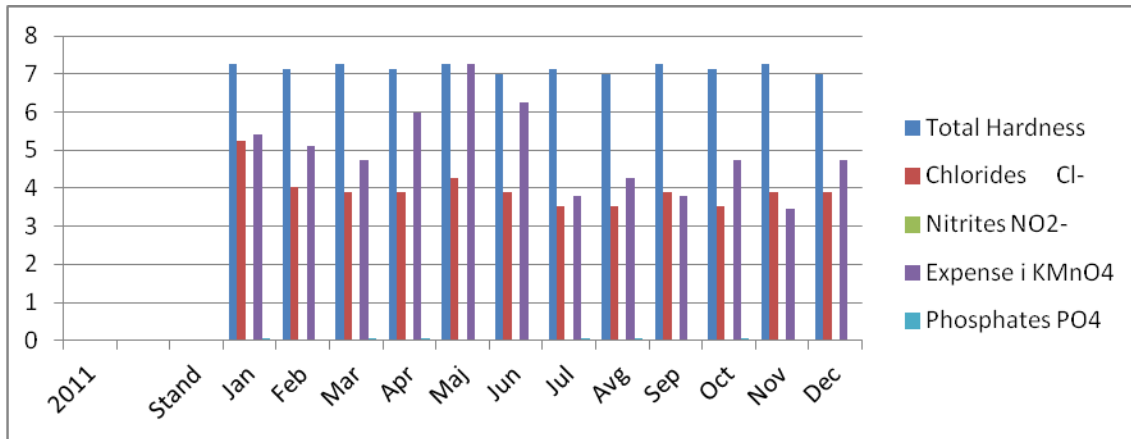
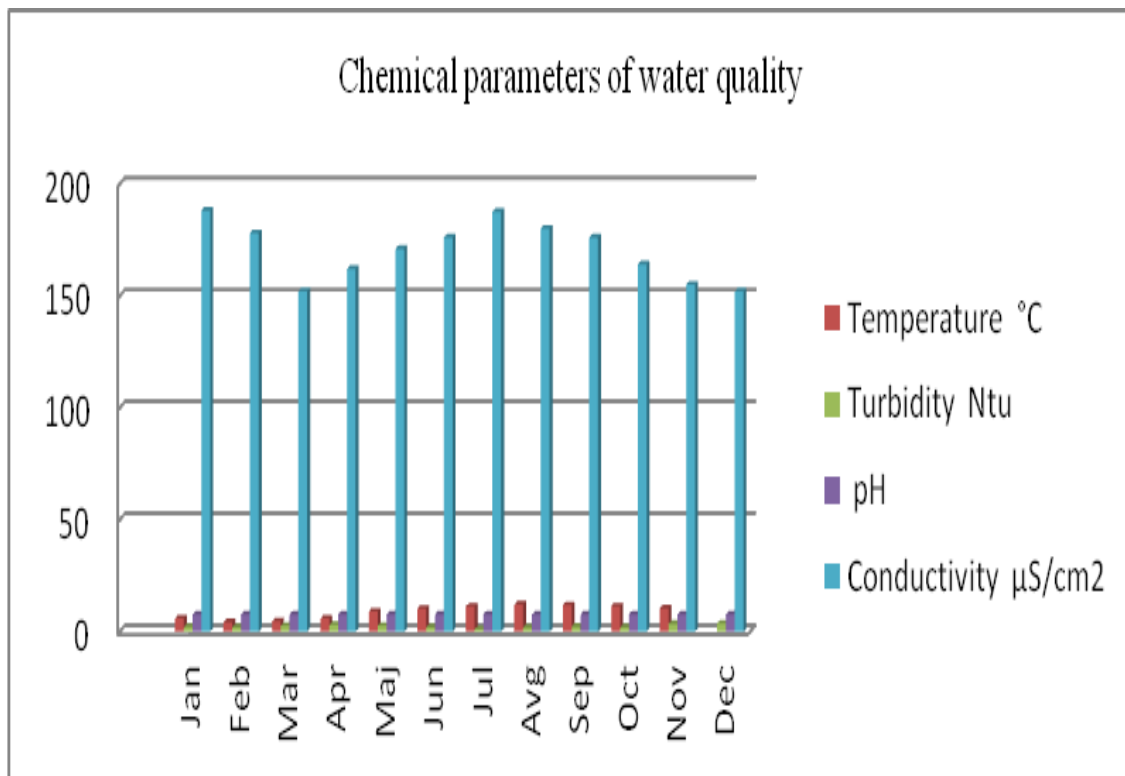


Figure 2. Chemical parameters of water quality in the Lake Radoniq.

Table 3 . The values of the physical parameters of water quality in the Lake "Radoniq"

2012	Temperature °C	Turbidity Ntu	pH	Conductivity $\mu\text{S}/\text{cm}^2$
Stand		ISO 7027:1999	ISO 10523:2008	ISO 7888:1985
Jan	5.9	2.06	7.62	188
Feb	4.2	1.88	7.65	178
Mar	4.6	2.55	7.74	152
Apr	5.9	3.02	7.64	162
Maj	8.9	2.55	7.68	171
Jun	10.2	1.88	7.67	176
Jul	11.2	1.05	7.66	187.5
Avg	12.1	1.7	7.62	180
Sep	11.8	2.2	7.62	176
Oct	11.3	1.9	7.61	164
Nov	10.4	3.45	7.63	155
Dec	9.5	3.65	7.65	152

Figure 3. Chemical parameters of water quality in the Lake Radoniqi.



2012	Total Hardness ° dH	Chlorides Cl ⁻ mg/l ¹	Nitrites NO ₂ ⁻ mg/l	Expense KMnO ₄ mg/l	Phosphates PO ₄ mg/l
Stand	ISO 6059:1984	ISO 9297:1989	OSO6777:1984	ISO8467:199 3	ISO 6878:2004
Jan	7.28	3.89	0.002	4.74	0.06
Feb	7.28	3.89	0.002	4.74	0.04
Mar	7.14	4.25	0.002	4.26	0.03
Apr	7.28	3.89	0.002	5.05	0.033
Maj	7.28	3.89	0.004	4.10	0.08
Jun	7.0	3.89	0.0025	5.21	0.05
Jul	7.0	4.25	0.003	5.37	<0.05
Avg	7.14	4.60	0.002	3.79	0.03
Sep	7.28	3.89	0.02	5.84	0.03
Oct	7.28	3.84	<0.001	4.42	<0.005
Nov	7.14	4.60	0.002	6.63	0.03
Dec	7.28	4.25	0.01	6.0	0.02

Table 4. The values of the Chemical parameters of water quality in the Lake "Radoniq"

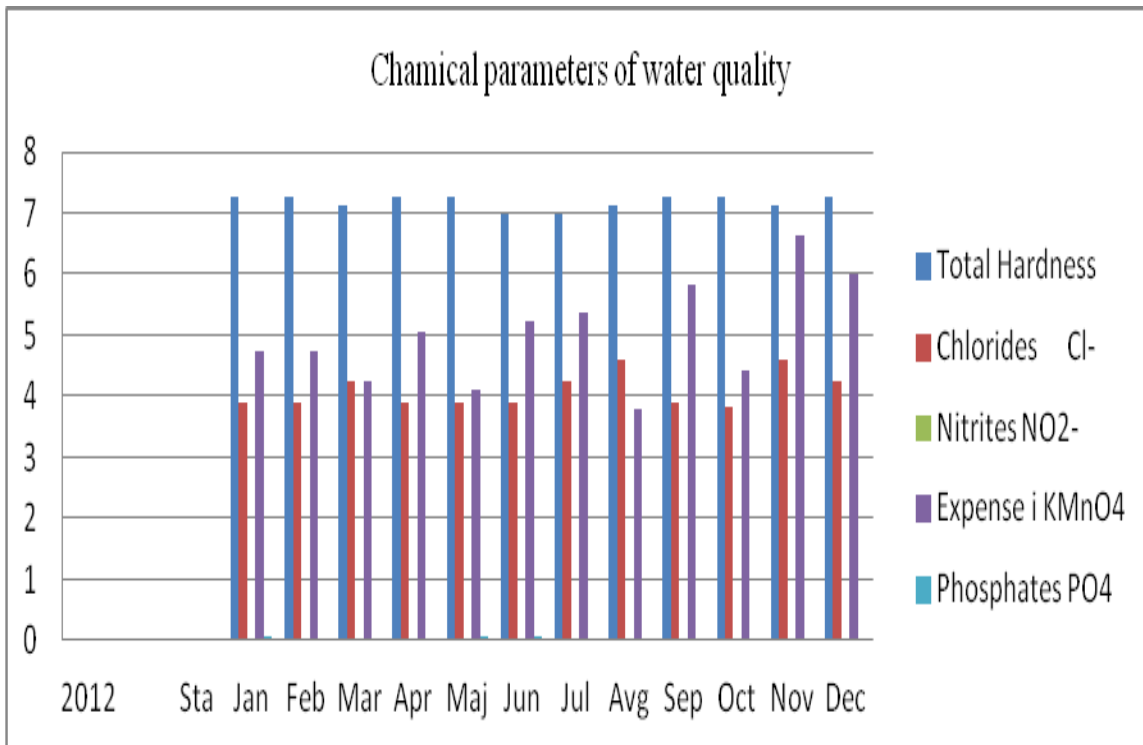


Figure 4. Chemical parameters of water quality in the Lake "Radoniq"

3. Discussion

The results of water analysis conducted during 2011 and 2012 in the waters of Lake "Radoniq" show fluctuations of physical and chemical parameters, starting with the temperature, which during the month of February 2011 we have a reduction in temperature of up to 4.2 °C, while during July and August there's an increase up to 12.1 °C, which is normal and it varies by seasons of the year.

Turbidity: the water in Lake shows growth during months of April, May, June, because of the water flow when the turbidity is around 1.05 NTU in August and in December it goes up to 3.65 NTU. This change is a result of high water flow to bring Lumbardhi of Decan.

PH value: It is the most important parameter because this parameter regulates the balance of CO₂ and water carbonates, and this parameter shows how the water will be treated. PH value parameter in our case is 7.50 to 7.74, and is within standard for drinking water.

Nitrites and phosphates show a gradual increase especially during the months of April, May and June as a result of uncontrolled discharges made by population along the canal for water supply to the lake.

The presence of organic matter such as potassium permanganate spending, it's within they are within the permissible limits for drinking water, which means that what we are dealing with a good quality water, but such waters need further treatment in the technological process and special attention be paid to process of Flocculation, coagulation, decantation, filtration and chlorination of water to eliminate the bacteria that are present in the lake water Radoniq. These processes are implemented promptly and with great success in water treatment Plant in RWC "Radoniq" in order to offer consumers the best quality water.

4. Conclusion

The monitoring of water quality in the lake Radoniq during this period we can draw a conclusion that the water quality in lake Radoniq is very good because it has a very clean environment without access to industrial and other uncontrolled discharges, however during the supply of water from lake Lumbardhi of Decan, especially during the snow melting where the water supplies are great to 8m³/sec, and carry soil quantities because of non-completion of the canal, and normally this lifts up the blur and other parameters, but water treatment plant is constructed so that the water must be treated and passed through these stages of technological process: prior chlorination, coagulation, flocculation, decantation, filtration, final disinfection by chlorination, which are performed regularly with much success in water treatment plant in RWC "Radoniq" in order to offer consumers the best quality water.

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