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Comparsion of some Chemical Parameters of Urban and Industrial Water Discharges Onto the River Lumbardh of Prizren

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Abstract: In this paper is described the concept of the monitoring system for water condition and physical - chemical parameters of the water quality. The biggest problem in environmental protection, is the quality of surface water. Complex approach includes physical and chemical analyzes of water of the river Lumbardhi, and those of discharge urban and industrial wastewater. Results from the analysis of the study will be used to manage eco - status in order to prevent negative trends and create a desirable balance of so important ecosystem like the system consisting of Lumbardhi river, yet with preserved biodiversity. The purpose of this paper is to compare the dynamics of river pollution Lumbardhi from urban and industrial discharge water during the same time intervals but different years. As a point of monitoring is selected the source of Lumbardhi L1 Prevall, then there is the point monitoring industrial area L2 and L3 point river outfall that has been marked with L3 Vlashnje. It was executed a monitoring of surface water through their physical - chemical analysis in two cycles: April-May 2012 and April-May 2015 of these parameters. Suspensive dissolved materials, biochemical oxygen consumption, chemical oxygen expenditure and total organic carbon in the source of Lumbardhi river, in the urban area and in the river outfall of Lumbardhi. Through this monitoring, in this paper is made comparison of these above parameters which shows that the results obtained from tests which have been made in Hydro Meteorological Institute in Pristina resulted that there is a considerable pollution of the river Lumbardhi from these pollutants and according to our opinion this comes as a result of not sustainable economic-ecologic development, social-ecologic, eco education and lack of surface treatment and urban sewage, industrial. On the other hand, based on the ecological situation and physic - chemical characteristics of Lumbardhi River during time intervals, it will serve as the starting point for integrated management plans and, if necessary, for programs, measures and environmental protection activities.

Keywords: total suspended solids(TSS), biological oxygen demand (BOD), chemical oxygen demand (COD),total organic carbon (TOC), environmental pollution.

1. INTRODUCTION

Lumbardhi river originates in the Sharr mountains and flows into the White Drin. It runs through the center of Prizren town. Urban and industrial wastewater discharges take place without any prior treatment.

Industrial water discharges are generated due to the use of water in technological processes and in energy production. Discharging industrial wastewater composition differs substantially from the composition of municipal wastewater discharge and depends on the technological processes applied to them. They are today's greatest polluters of water resources. Industrial discharge waters are originating from the manufacturing process and include: process waters, sanitary water and water from cleaning equipment specific to each industry. Unlike municipal sewage, whose composition is known, discharging water from different industries and laundries is difficult to recognize large variety of the pollutants and their specific ingredients. (S Abdullah, 1979) The amount of industrial wastewater varies in a wide range, for a day as well as for long periods of time. This is due to the unstable processes and unstandardized technologies. Based on laboratory tests is estimated condition of the river ecosystem Lumbardhi by pollutants for periods from April to May, 2012, corresponding to medium discharges (winter cycle) and from April to August of 2015.

The purpose of control of the water quality of the river Lumbardhi from urban, industrial discharging waters is to determine the quality of water in flow rates higher and medium or low, in particular the dynamics of change in the arrival of a wave of inflows (melting snow, strong rain, etc.). Based on this and the fact that water quality is an essential element for calculating the balance of physical- chemical parameters, water quality measurements in these specific conditions are a much needed commitment. This is especially important in areas where into Lumbardhi river are executed discharges, because the spread pollution has a major impact on water quality and the environment (Alci C, 2010)

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The study includes differences in the amount and degree of pollution, the assessment of physical - chemical sewage discharge in Lumbardhi therefore their dynamics during the same time intervals but different years in order of seeing how our institutional bodies have succeeded in the treatment and sustainable development of our city which is a historical one, with cultural monuments and this river makes it an even greater architectonic beautiful city. (Hydrometeorology, Institute of Kosovo , 2011)

2. MATERIAL AND METHODS

Physical - chemical parameters analyses are done in Hydro Meteorological Institute in Pristina, in order to assess realistically the natural state of the river Lumbardhi, taking into account the discharging of urban and industrial services. Surveys are done for three site-sampling: Lumbardhi source - Prevalla (L1); The second sample site industrial area L2 and third sample taken prior to distribution of Lumbardhi in the White Drin; Vlashnje that have been marked with L3. During the study we considered the discharging, which come along all the way of Lumbardhi, running through urban area and exit to the city. Lumbardhi river of Prizren from the source to it's meeting with the White Drin River has no water treatment sewage, those of industrial ones and other recipients. Water flow as particularly important element varies from season to season. This makes changing the pollutants components during the seasons of the year.

To point out this fact, it is researched the dynamics of pollution at the same time intervals but in different years. So, we made a comparison of chemical parameters for the period April-May of the year 2012 and April - May 2015 to see the possible changes if any pollution. In the analysis are defined these physical - chemical parameters: TSS, COD, BDO_5 and TOC. Lumbardhi has been monitored in different weather conditions (temperature, atmospheric flow, etc.).

In every site-sampling marked with L1, L2 and L3 were taken three samples from them and the average value was found, as during the period April-May 2012 as well as for the period from April to May 2015. For example, for the second sampling, Industrial Zone (L2) for April-May 2012 were received three samples with results obtained: 13.0 mg / l; 13.2 mg / l and 13.1 mg / l and found the average value of 13.1 mg / l. Also in the same way it is done during the period April-May 2015, with three values obtained 10.1 mg / l; 10.3 mg / l and 10.2 mg / l was found an average of 10.2 mg / l. Average values were compared. In the same way is done for two sampling points L1 and L3 that are conform to standardized methods, which are reflected in the following tables and diagrams of this paper. (Emaz SH, 2009)

Bifurcation: Plot of local maxima of x with damping a decreasing (Fig. 1).

3. SAMPLING

Sampling is done in time intervals from April to May 2012, at three sampling points and April -May 2015. Water Sampling for laboratory analysis was done according to recognized standards. In this paper we are dealing with sampling of river Lumbardhi of Prizren and water discharge, always respecting the standard methodologies and based on ISO 5667-5 of the year 2006 on standard sampling rules. In this way we are trying to avoid the possibility of contamination of water samples for study. Sampling points for monitoring the pollution dynamics of Lumbardhi river for these two intervals are shown in Figure 1.

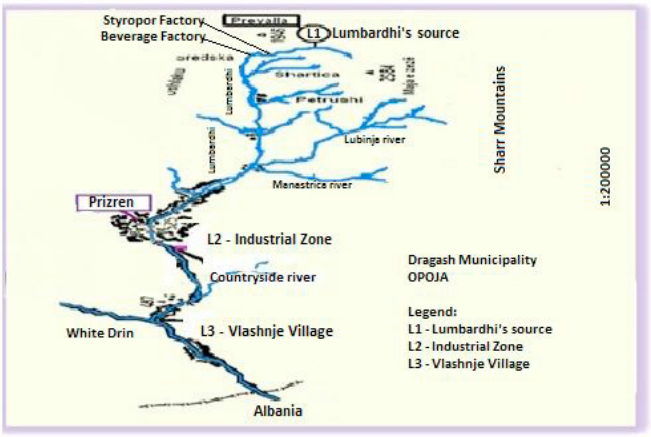

Fig. 1. Map of sampling sites

3.1 Results and discussions

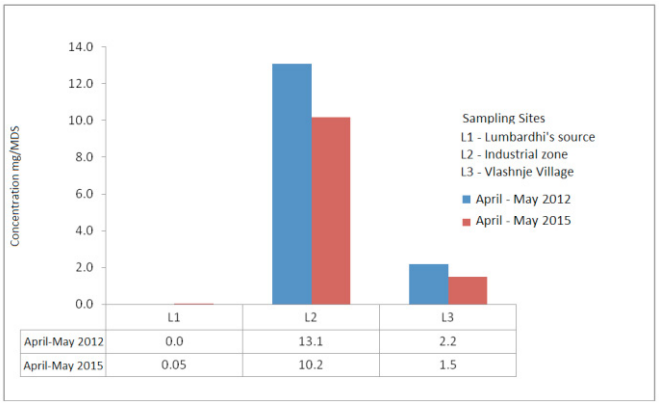

Fig. 2. Graphical presentation of the TSS concentrations in time intervals from April to May of 2012 and April-May 2015

Referring to the data in figure 2, it is noted that except the source L1 where the water quality is good, in other sampling points L2 and L3 the water quality is average and low level and by comparing to the same time intervals but in different years we see samples taken in 2012 both L2 and L3 of the concentration of measurements of diluted suspensive (MDS) is more polluted. (Nexhat D, 1998)