

# **Sources of Industry and their Environmental Impact to Surface Waters**

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## **Abstract**

The main goal of the study is analyzing some samples of water in pool as in Lepenci which lies in the region of Ferizaj and Llap river that lies in the Prishtina region and the industrial pouring along these rivers. It gives suggestions to diminish the environmental impact of effluent discharges and further improvements of actual situation. In many cases the impact on water, air and soil compartments has resulted irreversible. Effluents produced by these economical sectors are discharged, with no previous treatment processes, by dumping the pollutants to the surface waters. As a result of uncontrolled exploitation of natural resources because of the development has caused the pollution of the ecosystem with toxic elements as: Mercury, Arsen, Cuprum, Zinc, Nickel, Mercury, Mangan and Cadmium. The aim of this project is researching the degree of pollution with heavy metals in vegetables products such as "potatoes and onions" along the flow of water in the rivers. A Multi elementary analysis with ICP techniques is realized in Agrovet Laboratory in Fushe Kosova – KOSOVA.

**Key words:** water pollution, heavy metal, environment, potato, onion.

## **Introduction**

Because of contamination of the water of river Sitnica from anthropogenic influence caused in environment even this waters of rivers can be a great contaminant as a result of deviation that are made along its flow. It is scrutinized plant contamination with heavy metals along the rivers, because of the overflow of the river. Water is essential substance for life existence. Even though that water is very important for everyday needs it is also essential substance for the development of industry. Today, when the industry is in progress there are a lot of problems because of the lack of the pure water as result of bad industrial management. Decomposition of organic matter and the pollution caused from human activity are considered to be the main sources of rivers pollution. The growth of population and life standard has increased the need for water, even that water quantity in ground is approximately the same ore every day more contaminated. This problem makes us become more concerned about this and there should be on going care and water monitoring of water quality.

## **Material and methods**

The sampling is made on the sampling places are selected (sign 1 and table 1) by taking into view characteristics of locations in each were expecting pollution with heavy metals on the agricultural vegetables "Potatoes and onions "on that place where was seen that the water of a rivers, came out its bed near the river. In every sample locations were taking two kg potatoes and onions. In sample locations is determined geographical position with GPS, model EXTRAX, "GARMIN", 12channel, in beginning taking samples for analysis were minimize and were made homogeneous, and the aim was that the sample to be more representative and results to be exactly.

Late the treatment of the sample is made with Gravimetical method, where at the beginning the sample was dried in the temperature 105C to take off the wetting and is measured the weight of the dry sample. Then calcinations are made in samples in the temperature around 800C with purpose to avoid all organic mess. Samples are treated with kingdom water mixing (HCl and HNO<sub>3</sub>) where we have placed to stay in stove up to boiling point longer than 30.

Sample	Location	I.M.D	Type of relief	Water level	Possible contaminants
D1/a	Lismir (in front of a bridge)	535	Field hole	Medium	River water ,traffic, Air .
D1/b	Lismir (in front of a bridge)	535	Field hole	Medium	River water ,traffic, Air .
D2/a	Lismir (Behind the bridge)		Field hole	Medium	River water ,traffic, Air .
D2/b	Lismir (Behind the bridge)		Field hole	Medium	River water ,traffic, Air .
D3	Vushtrri		Field hole	Medium	River water ,traffic, Air .

Table 1. Sample locations with the detail description.

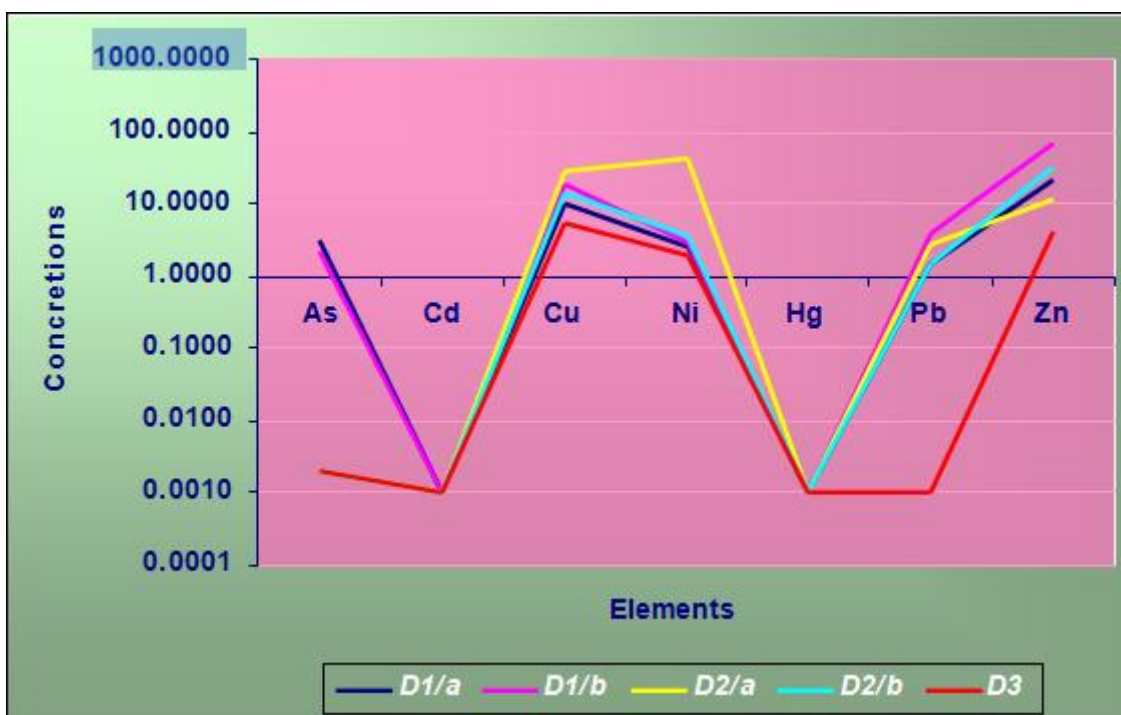
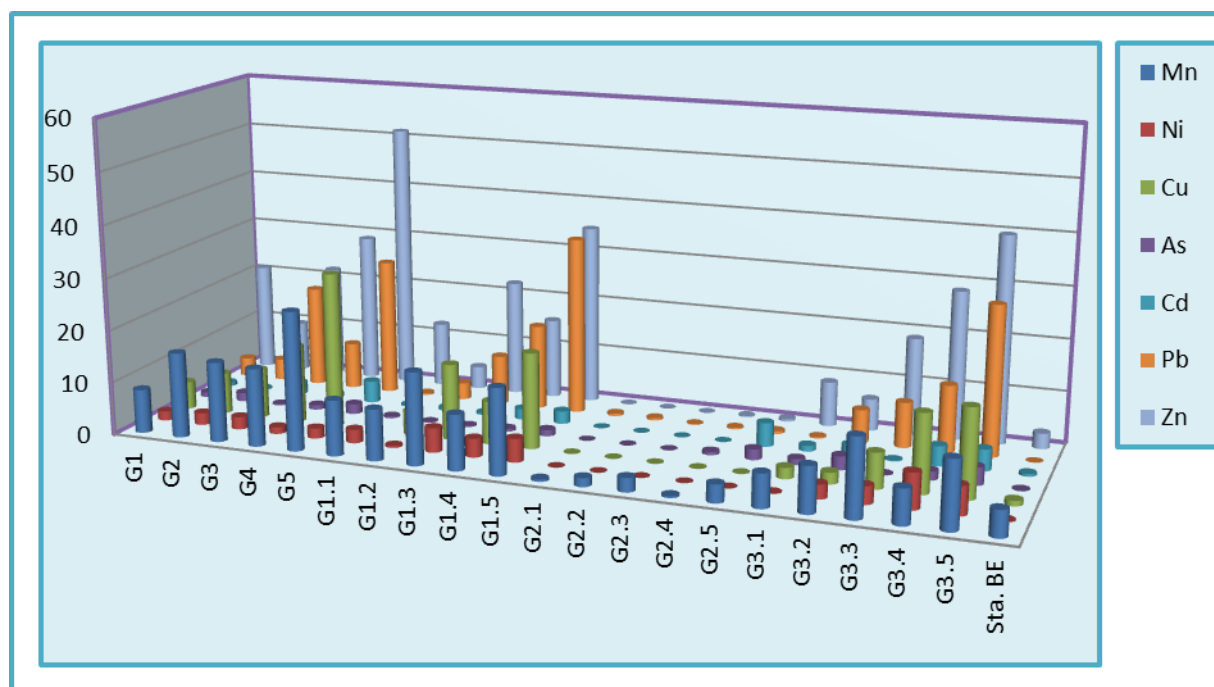


Figure 1. During analyses of the heavy metal in the vegetables product “potatoes and Onions which has a huge importance without contest, we have drawn expectable results.

Elementsppm	WHO (World health organization)
<b>As</b>	<b>1.0</b>
<b>Cd</b>	<b>0.05</b>
<b>Cu</b>	--
<b>Hg</b>	<b>0.02</b>
<b>Pb</b>	<b>0.3</b>
<b>Zn</b>	--
<b>Ni</b>	--

**Table 2. Allowed level of heavy metals in agriculture according WHO**

Cu and Zn even though are nutritive elements of human organism, don't enter in the group of risk, so they aren't in rule.



**Fig 2: Metal concentrations from Llapi watershed sampling sites (ppm)**

### Discussion of Results

In the places where we have overflow from the bed of the rivers and in the area where the water was used for irrigation was watched one considerable rising of the heavy metals in those areas. Values of concentration of the heavy metals changing as following: for arsen element (AS).

Value of concentration change from 0.002-3.11ppm for Cadmium (Cd), values have gotten out under the level of detection 0.001ppm, for copper (Cu) values of concentration from 5.39-28.47ppm for Nickel from 1.95-42.27ppm for lead element (Pb) from 1.461-3.92PPM while Zinc (Zn) change from 4.06-70.13ppm, while for mercury element (HG) have drawn concentration values 0.001ppm outside of the detection window. In the sample locations D<sub>1</sub> A/B AND D<sub>2</sub> A/B concentration of heavy metals have gotten out from allowed limit, according to the standards of Healthy World Organization.

Analysis of the quality of the water samples from this ecosystem, during the period of the study resulted that: Concentration of the heavy mineral and trace elements increase toward the river flow during increase of the effluent discharges, due to the anthropogenic activities to this river. Prevention and conservation of the surface water from Lepenci end Llapi watershed some recommendations are drawn: treatment of the urban wastewaters to prevent the pollution of this ecosystem. Collection and processing of solid waste waters, classified as raw materials. Creation of new relieves and forestations of this new relieves and degraded areas. Protection of the rivers' bed from their abusive exploitation.

The heavy metals are determined with technique ICP. But for discussions are taken those which are mostly characteristics and which have shown increasing values in comparison with other samples. By achieved results by this investigation, we can come at the end that in those sample locations of potatoes and onions where seen overflow of the river Sonica was and we have continual irrigation during all the time where was seen considerable increasing.

## References

1. Misra, S. G. and D. Mani: Soil Pollution. 1st Edit., Efficient Offset Printer, ABC., New Delhi, India, pp: 6-42, 1991.
2. Ministry of Environment and Spatial Planning. Kosovo State of the Environment Report. p. 21-24, 2003.
3. Lester B.: State of the World, 7, 18-21, 2001.
4. D. Rozhaja, M. Jablanovic: Ndotja dhe mbrojtja e ambientit jetësor, Universiteti i Kosovës në Prishtinë, Fakulteti i Shkencave Matematiko Natyrore, Enti i teksteve dhe i mjeteve mësimore, Prishtinë, 182-186. 1983.
5. Knoch, W.: Wasserversorgung, Abwasserreinigung und abfallentsorgung, VCH, Weinheim, New York, 557. (1994).
6. M. Bacaj: Adsorbimi i plumbit në SiO<sub>2</sub>, γ-Al<sub>2</sub>O<sub>3</sub> dhe MnO<sub>2</sub> në sistemet ujore natyrore. Disertacion, Universiteti i Kosovës në Prishtinë, 51-53. 1987.
7. B. Dalmacija: Kontrola kvaliteta voda, Univerzitet u Novom Sadu, Institut za Hemiju, Katedra za hemijsku tehnologiju i zastitu životne sredine, 15-17, 253. 2001.
8. B. Korça,: Analiza kimike e ujit, Donacioni i MASHTK & Östreich, Prishtinë, 71-121. 2003.
9. Thomas, R.: Beginner's guide to ICP-MS. Parts I-XI. URL: [www.spectroscopymag.com](http://www.spectroscopymag.com)