Research Article

Concentration of Heavy Metals in Plant Nutrient and Economic Value of Environmental Damage

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ABSTRACT

On presentation of "Homo Sapiens" environmental pollution have small dogs, the rate of global industry development, has also affected the Republic of Kosovo. It has begun to feel the environmental pollution. Environmental impacts from industrial began, poor management of waste and 450,000 vehicles in circulation on the streets of Kosovo. Over 80% of vehicles do not have a catalyst, were produced before the year 80, the remaining 20% produced after 80 years most polluted municipalities in Kosovo and Obiliq Municipality of Mitrovica, as a result of industrial activities such as mining "Trepça "Kosovo and power plants with heavy elements such as: (Pb, Zn, Ni, Cu, Cd). The environment in which we live are changing, natural resources (clean air), are being polluted climates are displaced, and entire ecosystems are being affected by the contaminants. These environmental changes are driven by many factors, including population growth, economic growth, industrial development, urbanization, and non-rational use of natural resources. Environmental degradation is a result of socio-economic activities, technological and institutional. Degradation occurs when natural resources (land, air, water), are getting poorer in quality.

Keywords: Metals, plants, environment.

INTRODUCTION

Kosovo is rich with natural resources has forced tens in creating policies and environmental regulations, by creating special agencies to monitor environmental health and increased funding for environmental protection[1]. Because of the large pollution in the past 15 years Kosovo is obliged to make such advances in many areas, to improve the quality of air, water and soil[2]. However, some areas of public policy are questionable as issues surrounding the environment or natural resources, due to the significant environmental impacts[3].

In the past 15 years it has achieved awareness of the growing social awareness of environmental management in Kosovo[7]. To encourage policy change rules that began to give out, "fruits" of money to solve environmental problems[4]. Our attention is focused on new generations to solving environmental problems is the result of advances in knowledge (research) science[5].

Ecosystem Management (EM), is an outstanding option of a policy recently proposed new generation environmental management of ecosystems[6].

MATERIALS AND METHODS

Surveys are conducted in R. Kosovo, in the fruit of the plant (Juglans Regia), plant that grows throughout R. Kosovo, cultivation extremely large due to the economic profit a large family is growing edge motorways. A plant (Juglans Regia), gives an annual yield of up to 50 kg a kilogram costs 10 euro.

Plant (Juglans Regia), vascular plants that is essential and non-essential minerals takes from the earth.

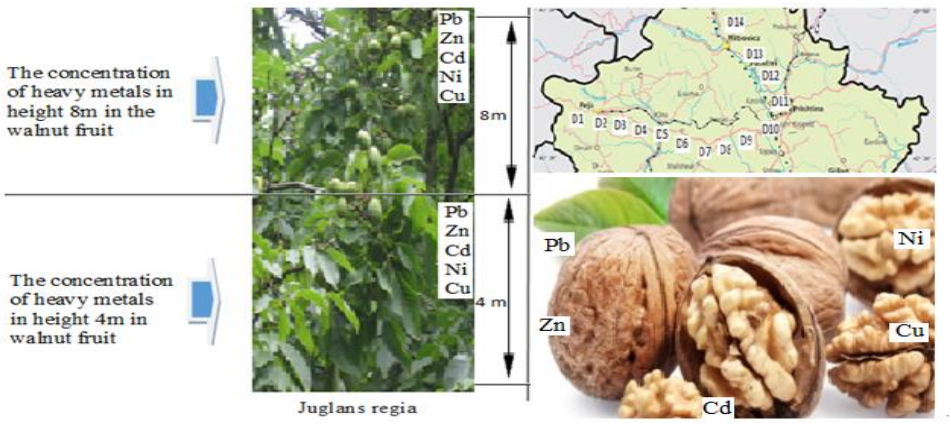

Figure 1: Schematic representation of the flow of heavy metals, the fruit of the plant (Juglans Regia), sampling points that showed up to 4m and 8m.

Table 1: Parameters with minimum and maximum values by EU legal norms (µgm-^{3}).

Elements µgm^{-3}	Concentration lower	The average concentration	High concentration	The high beyond measure	The normal value
Pb	21-40	41-100	201-1000	>1000	<21
Zn	101-150	151-300	701-1500	>1500	<101
Cd	1.1-2.0	2.1-3.0	7.1-20.0	>20.0	<1.1
Ni	21-30	31-50	101-200	>200	<21
Cu	1.0-20	21-100	201-1000	>1000	<20

Table 2: The total content (mg/kg-^{1}), heavy metals in the ground space of 30 cm.

No	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14
Pb	10.99	11.41	8.00	11.8	12.7	14.1	15.2	16.7	16.8	17.1	18.0	18.9	22.0	22.0
Zn	100.2	101.2	110	112	114	100	99	121	122	134	96	123	140	139
Cd	0.12	0.11	0.18	0.19	0.29	0.13	0.24	0.20	0.28	0.30	0.34	0.26	0.35	0.40
Ni	179.1	180	181	160	188	190	191	196	201	203	230	231	235	240
Cu	51.3	51.4	55.6	39.0	40.5	39.6	42.6	50.8	55.9	59.0	60.1	50.1	77.9	89.0
No			Pb	Zn	Cd	Ni	Cu							
Directive 86/278/EEC^{3}			300	300	3.0	75	140							

Table 3: Concentration of heavy metals in the plant fruits (Juglans Regia), up to 4m. (ppm).

Elements		Sampling points												
No	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14
Pb	4.1	3.1	4.6	5.37	5.99	4.12	4.4	9.55	9.34	9.85	11.5	15.2	18.5	19.7
Zn	141.4	152.7	138	141.1	224.4	214.6	211.8	221.0	224.4	226.1	246	226	245	235
Cd	1.1	1.1	1.2	2.1	1.2	2.3	1.3	1.4	1.1	1.8	1.7	1.2	1.9	2.4
Ni	18.1	18.1	19.7	11.4	17.9	11.1	11.6	11.2	11.9	21.6	21.1	26.1	27.2	29.1
Cu	22.1	23.6	29.0	24.9	26.0	23	29.9	21.0	24.9	24.9	22.2	23.7	28.1	29.2

Table 4: Concentration of heavy metals in fruit plant (Juglans Regia), up to 8m. (ppm).

Elements		Sampling points												
No	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14
Pb	3.8	2.5	4.1	5.1	5.2	4.1	4.0	8.55	8.3	9.0	10.6	10.1	10.1	10.1
Zn	134.1	80.7	99.8	98.0	200.4	200.6	201.8	202.0	205.4	206.1	201.0	211.1	212.0	219
Cd	0.83	0.99	0.7	0.97	0.98	0.92	0.92	0.95	0.85	0.88	0.92	0.94	0.98	0.99
Ni	15.1	11.2	14.1	14.2	14.9	14.3	14.6	14.2	14.9	14.6	14.1	14.1	15.1	16.2
Cu	20.1	20.6	20.9	22.9	21.0	21.1	19.1	19.0	19.9	19.9	19.1	19.7	19.4	20.2

Samples were taken at various stations starting in the area of Peja and Prishtina-Mitrovica, near the roadway. Monitoring stations are distributed uniformly. Sampling is done on all the main streets and at key points.

Identification of heavy elements method is used ICP-OES (induction coupled plasma-mass spectroscopy), it is a contemporary approach and very high precision. A total of 84 samples were taken, 6 of each sampling points that separate from the plant height of 3 to 4 m, and 3 up to 8 m. Samples are dried sent to the laboratory for determination of heavy metals. They are conducted soil analysis in space 30 cm near the trunk of the plant, site-sampling 42 samples in each of the three soil samples.

The results of the concentration of heavy metals in soil presented in table 2.

Negative effects of heavy metals

Lead: Released from burning gasoline vehicles and braking, it has a negative effect singles mental retardation children, developmental delay, chronic nerve damage, liver and kidney damage[10].

Cadmium: causes lung disease, lung cancer, bone deformation, high blood pressure, kidney damage[8].

Zinc: Causes damage to the nerve membranes, skin corrosive effect[10].

Copper: causes anemia, kidney and liver damage, etc,.[9].

CONCLUSION

An analysis of the results show that the concentration of heavy metals in fruit plant (Juglans Regia), ranges: Pb in sampling D1 is focus on small, whereas the sampling points that as D10, D11, D12, D13, D14, the concentration of Pb increase on rates (Directive 86/278 / EEC3), as a result of the increase in vehicles on the road and mining and industrial activities "Trepça" in Mitrovica. Also for all other elements of the plant fruits (Juglans Regia), such as Zn, Cd, Ni and Cu have increased from D1 to D14 (Pb> Zn> Cd> Ni> Cu).

In table4. It noted that over 8 meters height fruit plant samples (Juglans Regia), resulting in lower concentrations of heavy metals because metals transportation vascular plants hanging down. Although we focus higher concentrations of metals and 4 sampling points that the rates allowed worrying trend that the metals are increasing their concentration. Very soon these fruits will be usable due to increased concentrations of heavy metals.

Where economic damages are enormous.

Recommendations

To prevent contamination of natural resources, to achieve standard normal borders, we recommend that attention should focus as follows:

- Prevention of pollution of water, air and land vehicles, and setting catalyst, removal of old vehicles from the streets of Kosovo. (The application of environmental laws);
- Provision of ensuring quality and aquatic ecosystems, air and soil, through adequate environmental monitoring;
- Treatment of wastewater in urban and rural areas, recycling of waste;
- Improvement of waste collection and sanitation;
- Rehabilitation and increase the greenery in degraded areas;
- Construction of measuring stations to air, water and soil, chemical and microbiological monitoring, for instance the level of pollution of surface waters;
- Awareness of the population entirely on the value of water, air and soil as a national wealth through various forms of mass communication (conversation).

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