MINISTRY OF ENVIRONMENT AND SPATIAL PLANNING
KOSOVO ENVIRONMENTAL PROTECTION AGENCY

AMMK

Report
ENVIRONMENTAL HOTSPOTS IN KOSOVO

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ENVIRONMENTAL HOTSPOTS IN KOSOVO

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Kosovo Environmental Protection Agency

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TABLE OF ACRONYMS

EAR	European Agency for Reconstruction
KAP	Kosovo Privatisation Agency
KEPA	Kosovo Environmental Protection Agency
BAT	Best Available Technology
EU	European Union
GDP	Gross Domestic Production
DANIDA	Danish International Development Agency
DUTCH	Dutch Development Agency
EMKO	Residues from zinc processing process
SOK	Statistical Office of Kosovo
EAP 6	Sixth Environmental Action Program of the EU
FSK	Kosovo Security Force
IFCS	Intergovernmental Forum for Chemical Safety
REACH	Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals
IPPC	Integrated Pollution Prevention and Control
KEC	Kosovo Energy Corporation
KFOR	NATO Kosovo Force
MESP	Ministry of Environment and Spatial Planning
MDE	Ministry of Economic Development
WHO	World Health Organization
UN	United Nations
PIM	Industrial Park of Mitrovica
SIDA	Swedish International Development Agency
SharrCem	Cement factory in Hani i Elezit
TPP A	Thermal Power Plant Kosova A
TPP B	Thermal Power Plant B
TMK	Kosovo Security Corps
UNDP	United Nations Development Program
EIA	Environmental Impact Assessment
SEA	Strategic Environmental Assessment

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1. INTRODUCTION

1.1 Foreword

Among the issues affecting the environment in Kosovo are environmentally sensitive sites, which in scientific terminology are defined as "environmental hotspots". Based on this fact, the MESP in cooperation with ministries and other institutions have recognized this problem, and through specific plans and projects have treated it as a high priority issue.

Environmental hot-spots were mainly created as a result of past industrial activities, caused by mining activities, unmanaged old landfills, stored chemicals, waste oils, expired pesticides, and so on. Knowing the significant environmental impact of these hotspots, as well as health risks for citizens, the MESP through Kosovo Environmental Protection Agency has identified about 110 sites as the most sensitive points, 26 of which have been identified as potential hotspots and are presented in this publication. Such hotspots are as those in the Municipality of Mitrovica - PIM, in municipality of Obiliq - KEC activities, in the municipality of Gllogoc - Ferronikeli activities, then hot-spots in Kishnicë, Artanë, Hani i Elezit etc.

Given Kosovo's limited financial resources, and insufficient MESP budget, it has not been possible to undertake all actions necessary to solve problems, and rehabilitation of hot-spots. With the help and support from international institutions, which are providing valuable contribution, such as: the European Commission, the Government of the Netherlands, the Czech Government, the Danish Government, the World Bank, UNDP, actions for rehabilitation of hotspots resulting from old landfills and industrial landfills were undertaken. Despite this, Kosovo needs to establish effective mechanisms for environmental management including hotspots.

Furthermore comprehensive studies are needed for hotspots, in particular for their rehabilitation. Also, favourable policies to encourage private sector, and to establish partnership for environmental management should be developed. Hot-spots represent a serious problem for the environment. These problems require analysis, implementation of remedial measures, and long-term monitoring, in order to avoid further risks to human health and nature.

1.2 Acknowledgements

Dear reader,

The general public in Kosovo has little knowledge of the existence of environmental hotpots, and even less knowledge for their effects on public health and the surrounding environment.

This report contains information on areas of high pollution in Kosovo that in environmental terminology are known as hot-spots. Hotspots are considered delicate areas not only for environment, but for public health as well. Therefore, they require emergency treatment, rehabilitation and continuous monitoring. It is very clear that problems arising from hotspots cannot be resolved only by the development of this report. Therefore, we hope that this report will serve as a good basis for further discussion and analysis of the roads that lead to resolving the problems of these sensitive areas.

The report was prepared by Kosovo Environmental Protection Agency, in cooperation with other sectors of the Ministry of Environment and Spatial Planning, and with the support of the Ministry of Economic Development. Other governmental and non-governmental organisations contributed to this report as well.

KEPA express the gratitude to all those who contributed to the preparation of this report. We hope that this collaboration is a good indicator that shows for commitment of the institutions, donors, experts, and other stakeholders to do more to identify, research, rehabilitate and resolve the environmental hotspots in Kosovo.

1.3 The aim of the report

Environmental pollution is a widespread problem that knows no national boundaries. Contamination of water, soil, and air in many parts of the world, but also in Kosovo, is a serious environmental problem, and a permanent risk to public health. Industrial development that does not comply with environmental standards is the main source of pollution. Because of abundant natural resources, part of Kosovo's economy has been oriented on development of the mining sector. Greater exploitation of these resources has been occurred especially during the 70s and 80s. Consequently, there are inherent problems in the field of environment. Here, above all, we must emphasize the impact on the environment from industrial waste, industrial plants, tailings (mine dumps), storage of chemicals from agriculture etc.

Identification of hotspots was one of the tasks and responsibilities of KEPA, and this was included in the work plan. Identification of potential hotspots carried out by KEPA, has found support from UNDP, through the engagement of an international expert. During this research, many sensitive environmental locations are identified, but only the sites with high potential for environmental impact and health risk are evidenced. In the entire territory of Kosovo around 110 sites as environmentally sensitive spots have been identified, whereas 28 sites with the greater potential for impact on the environment and public health are evidenced, and presented in this report. The total area of these hotspots is about 9.94 km^2 or 0.09% of the territory of Kosovo. Because of contamination, the identified hotspots, remained unused in terms of economic, agriculture, urban planning, recreation, and tourism needs, so in addition to the impact on the environment and public health, they have an indirect impact on other areas of social developments.

The aim of this report is to identify potential environmental hot-spots in Kosovo, to provide basic information about their condition, and to provide information which could be used to initiate projects for developing more detailed studies, and to help addressing this issue in the future. Data for preparation of the report were collected from site visits, meetings, and contacts with various governmental and non-governmental institutions, from the projects carried out in this area, as well as from public enterprises that manage these areas. In addition to providing a realistic picture of the state

of these areas, by providing recommendations, the report aims to identify the most priority needs, in order to take action for rehabilitation.

2. Kosovo profile

2.1 Geographical Position

Kosovo is located in the central part of Balkan Peninsula. Lies between 41°50'58" and 43 ° 51'42" of northern geographic latitude, and 20°01'3 " and 21°48'02" of east geographic longitude. Kosovo has an area of 10,908 km^2. According to preliminary results from the preliminary census conducted by SOK in 2011, Kosovo has 1.73 million inhabitants, and the average density of 159 inhabitants per km^2 (this census does not include the municipalities of Leposavic, Zubin Potok, and Zvecan). Kosovo is surrounded by Albania (southwest), Macedonia (southeast), Serbia (east, north and northeast) and Montenegro (west). The total length of Kosovo border with neighbouring countries is about 700.7 km ^{2}.

2.2 Relief

Kosovo is a mountain and lowlands country, composed by Kosovo Plain (Fusha e Kosoves) (with 510-570 m above sea level) and Dukagjin Plain (350-450 m above sea level). The average above sea level of Kosovo is 810m. The lowest peak is 270m, while the highest 2656 m (Gjeravica). In terms of hypsometry, the area below 300m above sea level includes only 16.4 km ^{2} (0.2%) to 1000 m are expanded 8754 km ^{2} (80.7%), from 1000 to 2000 m 1872.3 km ^{2} (17%) and over 2000 m to 250.6 km ^{2} (2.3%). The main forms in Kosovo landscape are: mountains with 63% and hollows 37%.

2.3 Climate

The climate is continental-sized, with a dominant influence of Adriatic-Mediterranean climate in Dukagjini Plane, through the valley of Drin i Bardhe, and with the lesser impact of change-Aegean Adriatic climate in Fushe Kosovo. The average annual rainfall is 596 m. The average annual

temperatures in Kosovo are 10^{O}C, with the minimum temperature reached to -27.2 and maximum 39.25. The main local factors that affect the climate of Kosovo are: landscape, water, land and vegetation.

2.4 Geologic structure

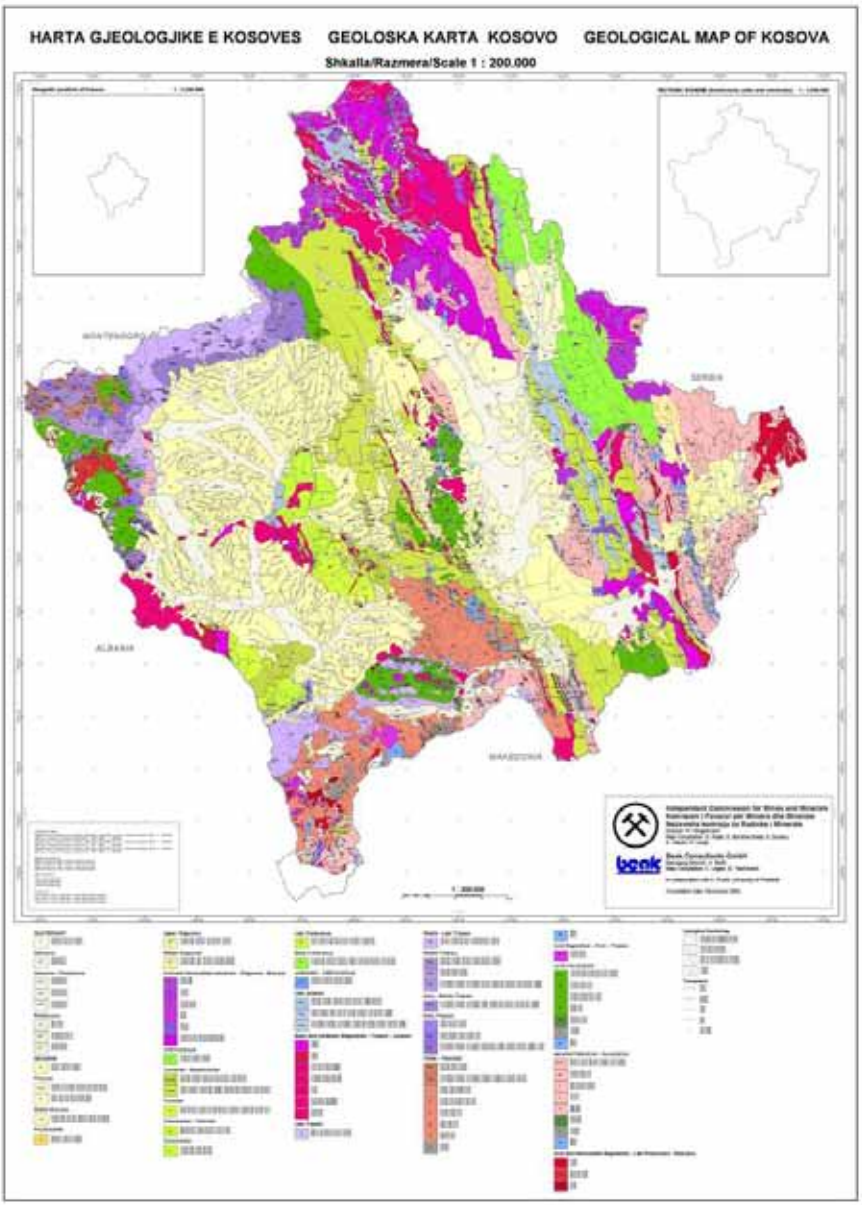
The Kosovo territory is characterized by a complex and interesting geological structure. This is proven by the large number of lithological complexes, and geological formations from wide Cambrian to Quaternary.

Proterozoic rock formations are the crystalline shapes of Dardan masses, stretching east to Kamenica and Karaçeva. This compound belongs to the age of Cambrian period, built by gneiss and leptinolits, mika-shist, leuko-gneiss, amphibolites, quartzes and migmatite.

Paleozoic formations are widespread in Kosovo and discovered in Mountains of Sharr, Bjeshkët e Nemuna, Mokna as well as in vicinity of Trepça

Mesozoic formations have considerable spread in the territory of Kosovo, where the Cretaceous and Triassic are more prevalent in relation to the Jurassic. Tertiary formations fill the tectonic lowlands of Dukagjini Plain, Kosovo Plain, Drenica, Llap and Gjilan, where by paleontological researches are found Oligocene, Miocene, and Pliocene. Volcanogenic products are spread in Stanterg region, Kishnicë-Janjevë, Morava e Binçës, and Strezovc-Artana.

Quaternary deposits – cover lowlands and river beds of Drini i Bardhë, Sitnica and Morava e Binçës, represented by river terrace sediment; alluvial products, prolluvial, delluvial and Moreno products.



Map1. Geological structure of Kosovo[1]

1 http://www.kosovo-mining.org/kosovoweb/al/home.html

2.5 Population

Referring to the official records, in the period 1948-1981 the population of Kosovo has been steadily increasing. From 727.820 inhabitants the population number is increased to 1,584,440, which shows an increase of 856.620 inhabitants or 117.9%. After this period, Kosovo for a long time (30 years) has faced a lack of official statistical data on the population, so that the determination of population number is mainly based on estimates and projections.

Such an assessment is also made in 1991, according to which the country had 1,956,196 inhabitants. In 2011, the Statistical Office of Kosovo has conducted the population census, which did not cover the entire Kosovo territory. Preliminary results of this census show that Kosovo has 1,733,872 inhabitants. The population number of Kosovo under this census is not in line with the increasing trend of population in Kosovo. This may be due to several factors, including: changing the methodology of census, emigration during 90es according to estimations where approximately 400 thousand inhabitants have left Kosovo, exclusion of the population from North of Kosovo in the census, and other factors.

Kosovo's population is young. In 2006, the age group 0-19 years was 38%, the age group 20-64 constitutes 56%, while the older age group over 65 years is 6% of the total population.

Table 1: Kosovo population figures 1948-2011

No	Year	Nr. of population	Source
1	1948	727,820	Census, SOK
2	1961	963,988	Census, SOK
3	1971	1,243,693	Census, SOK
4	1981	1,584,440	Census, SOK
5	1991	1,956,196	Estimation, SOK
6	2011	1,733,872	Preliminary results of Census 2011, SOK

3. Economic Development

3.1 The history of Kosovo economic development in brief

Looking at the chronology of Kosovo's economic development until 1950, the country was a typical agrarian country, with no developed industry, where agriculture accounts for 70% of the GDP.

In the period 1971-1980, Kosovo reached the highest degree of economic growth, and qualitative changes in the production structure. In this period the most important projects in industry, infrastructure and economy were carried out.

The period 1989-1998 is known as the period of economic development paralysis in all sectors of the economy. At this time, Kosovo was characterized by political tensions until 1999, when the conflict escalates in a frontal armed war, which induced the international military intervention. By the deployment of the UN mission in Kosovo, measures were taken to overcome the difficult economic and social situation. During the years 1999-2010, the major part of economical assistance was provided by external donators.

Kosovo's economy has yet to recover through the privatization process, which is in process. Private business has made significant steps of development (51% of GDP). Diaspora also constitutes an important factor in economic development, which is shown ready to invest, but still there is no adequate legal infrastructure for investment from abroad[2].

3.2 Current state of economic development of Kosovo

Total number of registered enterprises by the end of 2009 has reached the figure of 74436. Compared to 2008 (67950 companies), there is an increase in the number of newly registered enterprises for 6486, or expressed as a percentage for 9.5%.

From the total number of enterprises registered, it is indicated that the most preferred economic activities are: trade enterprise 33826 (45.4%),

2 Report of American Council for Economic Development

transport and telecommunications with 9641 (12.95%), hotels and restaurants with 7230 (9.7%), processing industry 6976 (9.4%), construction with 4418 (5.9%), other activities, social and personal 4121 (5.5%), real estate and leasing with 3788 (5.1%) and others[3].

The process of privatization of public enterprises can be considered as a push for Kosovo's economic development. The Kosovo Agency for Privatization (KAP) is the institution that is responsible for privatization of public enterprises. As successful cases of privatization process that impacted the Kosovo's economic development impact can be mentioned: Ferronickel Plant, Banja Kllokot, Vineyards Stone Castle, Hotel Theranda, Trofta, M & Silosi, Peja Brewery, Hotel Nora etc.

3.3 Kosovo economic development challenges

Looking at regional and European context, and referring to the economic development indicators, (such as GDP), Kosovo has a very low level of economic development, and is ranked last on the list. Uneven economic development or development imbalances, originates from the economical system from the past, because of economical and political situation during 90es, and from complex transition process after the war.

The most expressed imbalances relates to: the relationship between GDP and consumption, export and import, supply and demand for labour, the consolidated budget and needs for investment in infrastructure and public services. Increased economic stability, as a matter of primary importance, is challenged by present imbalances that characterize the current economy.

The past industrialization development based on natural resources, reflected in the disproportionate expansion. So, during the seventies, until the second half of the eighties, in terms of industrial and urban development, the seven largest urban centres were clearly differentiated.

With the collapse of old industrial structure, de-industrialization during 90's, and major technological changes occurred recently, the new economic development process was affected seriously. The consequences of uneven development are reflected in various aspects of the social, economic and environmental developments.

Uneven development in the environmental aspect is due to the irrational use of land, a phenomenon resulted in non efficiencies in the areas of planning, monitoring and sustainable development.

3 Report on statistics on economic enterprises in Kosovo T4 – 2009, page 9

4. Definition and classification of hotspots

4.1 "Hotspot" definition

The term "hotspot" is now becoming a common definition in the field of environmental protection. It is increasingly being used to draw attention to certain specific situations or environmental concerns. "Hot-spot" is actually a new notion, specific, and ambiguous. Its meaning depends on the context in which it is used. In general, it is used to show an activity in a site, or in a situation that is beyond the ordinary, either in positive terms (eg areas with rich biodiversity, etc.), or even in the negative terms (areas with high environmental pollution).

Undoubtedly, particular interest to readers and environmentalists has the use of the term "hotspot", to describe areas with high pollution potential, and related health and public health impacts. Environmentalists usually use the term "hot-spot" when referring to the negative change, and environmental deterioration in a particular area, or to describe the contaminated areas that remained uncontrolled or unmonitored for a short or longer period of time, and that have harmful effects on the environment and humans. So, the negative sense of the term "hotspot" is something undesirable, unfavourable, and dangerous to the environment and health.

Even though in the context of elaboration of specific issues, the term "hotspot" is often used, in the framework of concepts and terminologies indicated in Kosovo environmental legislation, there is no adequate definition of the term "hotspots",

In this report, the term "hotspot" should be understood in the negative sense, as in the report are addressed polluted areas, which are created as a result of various economic activities.

4.2 Classification of hotspots

There is no special classification of hotspots, according to a criterion or a certain legal framework. However, in this report we classified hotspots according to the economic activities, by which the hotspots were created.

Thus, if we refer to the Law on Integrated Pollution Prevention and Control (Law no. 03/L-043), the annexes provide different categories of economic activities as a result of which can be created sites (areas) with high pollution potential (hotspots) as:

- Sites contaminated by the energy industry;
- Sites contaminated by metal production and processing;
- Sites contaminated by minerals industry;
- Sites contaminated by chemical industry;
- Sites contaminated by waste management;
- Sites contaminated by mining activities;
- Sites contaminated by other activities;

A similar Classification of contaminated sites (hotspots), depending on the source of pollution is found in the Annex I of the **IPPC Directive.**

1

5. Treatment of hotspots in Kosovo

5.1 National Legislation for treatment of hotspots

Although evidences show for a number of hotspots in Kosovo, yet there is no specific law or administrative instruction in place, to regulate this matter.

So far the problem of hotspots in Kosovo is treated based on the context of several environmental laws:

- Law on Environment Protection,
- Law on Environmental Impact Assessment,
- Law on Mines and Minerals
- Law on SESA
- Waste Law
- Law on Chemicals
- Law on Biocide
- Law on Integrated Pollution Prevention and Control
- Law on Nature protection

5.2 Programmatic and strategic framework

Kosovo does not have a strategy, plan, or a special program for the treatment of hotspots. So far this issue is addressed through other strategies, plans and programs such as:

- Kosovo Environment Strategy 2005-2010
- Kosovo Environmental Action Plan 2005-2010
- Draft Strategy for the Mining Sector
- Local Environmental Action Plans
- Draft Strategy on Waste Management, etc.

5.3 Completed projects on rehabilitation of hotspots

As for monitoring, evaluation, assessment, and treatment of hotspots so far, the MESP has approached this problem with different forms, either through assessment projects for their state, or rehabilitation projects. Valuable contributions to this issue have given other government institutions, international organizations, and various donors.

During 2007-2009, some environmental investments were oriented in rehabilitation of several landfills, and on full closure of old landfills of municipal and industrial waste.

Ministry of Environment and Spatial Planning, in 2007 invested in the rehabilitation of three municipal waste landfills: Kaçanik, Prizren and Gjakovë, and in 2008 were rehabilitated landfills in: Lipjan, Prizren and Gjilan. During 2009, the European Commission in cooperation with the Ministry of Environment and Spatial Planning has invested in rehabilitation/ closure of eight old municipal waste landfills.

Information on completed projects for the rehabilitation of old landfills are presented in the following table. Other investments by MESP include the construction of seven centres for sterilization of infectious hospital waste, as well as the establishment of plants for temporary storage of hazardous waste.

Table 2 : Projects on rehabilitation of old landfills of municipal waste 2007-2009

Project name	Donor	Year of implementation
Rehabilitation of landfill in Prizren	MESP	2007
Rehabilitation of landfill in Gjakovë	MESP	2007
Rehabilitation of landfill in Kaçanik	MESP	2007
Rehabilitation of landfill in Ferizaj	MESP	2008
Rehabilitation of landfill in Gjilan	MESP	2009
Rehabilitation of landfill in Lipjan	MESP	2008

The Ministry of Economic Development of Kosovo, supported by international organizations and donors, has carried out several projects for rehabilitation of industrial landfills such as: Cleaning and land re-cultivation project of ash dump at KEC Obiliq, treatment of landfills in Artanë,

Kelmend, etc. Information on several projects carried out in this area are presented in the following table.

Table 3: Some of projects supported by international donation on environmental rehabilitation

Nr.	Project	Donor	Amount in EURO
	Partial restoration of wasteland in Zhitkovc	DUTCH	109.609
	Solid waste management in PIM	DUTCH	202.344
	Chemical safety ne PIM	DUTCH	9.535
	Safety of walls around tanks of sulphuric acid	DUTCH	32791
	Liquid waste treatment in PIM	DUTCH	457.021
	Repairing the roof of transformer station	DUTCH	27.567
	Security of the area – Fences and lights	DUTCH	24.256
	Demolition, PIM	DUTCH	229.774
	Cleaning the area of Zveçan – Smelter area	DUTCH	223.582
	Assessment of wasteland area, Plans for closure	DUTCH	220.229
	Air monitoring station	S I D A	496
	Cleaning the Kishnica riverbed	S I D A	3.000
	Transfer of soil for coverage	S I D A	20.750
	Re-profiling of Graçanicë landfill (first phase)	S I D A	286.330
	Solid waste management in Zveçan	DANIDA	400.000
	Restoration of landfill in Zhitkovc	European Commission	1.000.000

6. State of hotspots in Kosovo

6.1 Identified hotspots

During the past years, KEPA implemented a program on identification of hotspots. This activity was supported by UNDP, through the engagement of an international expert.

During this process, a number of environmental sensitive spots are identified. Only those areas which are considered to have a significant impact on the environment and public health are evidenced. During the fieldwork in the entire territory of Kosovo, about 110 sensitive spots are evidenced, whereas, 28 areas with the potential for greater impact on the environment and threat to public health have been identified and presented in this report.

The total surface of these hotspots is about 9.94 km^2 or 0.09% of the territory of Kosovo. The data presented in this report are primarily of informative nature, and in addition to informing the public about the state of the hot-spots, can also serve as a good basis for the development of projects for the rehabilitation of the hotspots, but also for orientation of policies and donations in the environmental field.

For the purposes of this report, and in order to be easily understood, the data collected during the field visits, will be presented separately in the following groups:

- Hotspots from chemicals
- Hotspots from agricultural activities
- Hotspots from transport sector
- Hotspots from sanitary landfills
- Hotspots from industry sector
- Hotspots from mining sector
- Hotspots from radioactive substances

6.2 Hotspots from chemicals

According to the existing data, more than 100,000 types of chemicals are known in the European market. Only a small number of them is studied, and tested to assess how safe they are, and what risks pose to human health and the environment.

Various chemical industries in the world still continue to produce, each year, thousands of different chemical substances. Very few of them have been tested for their effects on health and the environment, whether for short or long periods.

Mismanagement of chemicals, agricultural pesticides, and biocides in general, through the evaporation, or any form of their presence in environment, may lead to serious consequences for human health, biodiversity, ozone layer, and to other environmental components[4].

Waste chemicals are polluters of large land surfaces as a result of industry and technology activities, discharges from various industrial processes, and their accumulation. Toxic chemicals have greater affinity to penetrate in various environments, such as rivers and lakes, air, soil and even in seas and oceans.

Until 1989, the chemical industry was the most important branch of industry in Kosovo. There are very few local producers of dangerous chemicals, but the largest amount is imported from various countries.

However, in several warehouses, garages or other types of storages of the factories, large quantities of chemicals were left uncontrolled and unmonitored, and kept in inappropriate conditions. In most cases, the owner of these chemicals is unknown, and without any surveillance, thus increasing the possibility for misuse and accidents[5]. Until now, mainly supported by donations and activities of KFOR and KSF, few actions are undertaken to reduce the risk of such chemical substances[6].

It is estimated that these sites are seriously contaminated, and pose a permanent risk for people living in their vicinity. From this form of land contamination are affected also the surface and ground water, and consequently, via the food chain the health of people and animals is threatened.

The industries that are currently out of order, and which resulted with chemical residues from former production processes are considered as a more problematic. The problem becomes even greater, when considering the fact that the legislative and regulatory system is not yet complete, and that the education of users for the risk of chemicals is unsatisfactory.

4 Environmental assessment in Albania after the conflict, UNDP
5 Kosovo Environmental Action Plan, 2006-2010, MESP, Prishtinë,2006.
6 Report-State of the waste in Kosovo, 2008

Kosovo lacks specific policies and strategies for the use and management of hazardous waste and chemicals. Kosovo is not yet included in the International Program for Chemical Safety (IFCS), through which Kosovo would be recommended to have clear policies and strategies to address the sound management of chemicals and hazardous waste,

6.3 Hotspots from agricultural activities (pesticides and fertilisers)

After World War II, Kosovo's rural population constituted over 80% of total population. In 1991 this percentage dropped to 63%, while it is estimated that in 2000, the percentage of rural population dropped to 60%. New circumstances contributed to reducing the number of people involved in, or generating incomes from agriculture.

After the latest war, the agricultural sector is found in difficult development situation, with abandoned farms, dysfunctional public enterprises, and damaged infrastructure[7]. Some of the buildings that were not destroyed, were transformed in the storages of chemical waste and expired fertilizers. These residues such as pesticides, herbicides, insecticides and fertilizers that were intended for use in agriculture, following the expiration of the use, were turned into unusable waste, and hazardous to the environment.

Also, the premises where they are stored, and the environment around presents a contaminated area, which is considered an environmental hotspot. Further, the situation exacerbates because of inadequate management, and improper treatment. Despite the fact that these items are identified as environmentally sensitive spots, there is still lack of detailed information on the type, quantity and chemical composition.

6.3.1 Storage of agriculture waste in Shirokë- Therandë

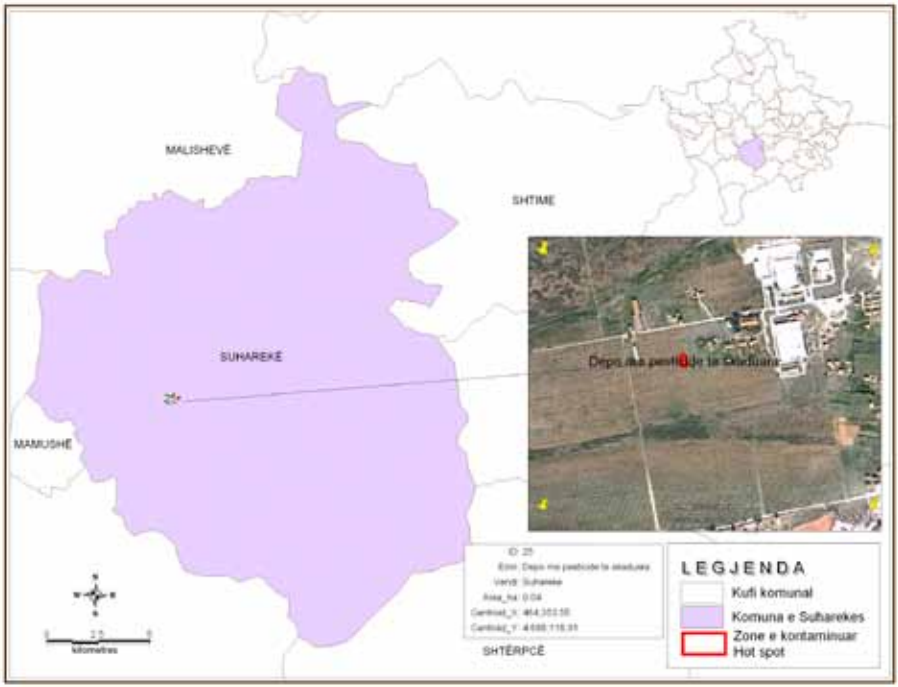
The premises where the agricultural waste is stored has an area of 0.04 ha. The infrastructure of this facility is old, and does not meet the criteria and standards for the safe storage of waste from agriculture. There is no complete information on the quantity and type of this waste.

During the past, for a limited period of time, this storage was under the management and monitoring of KFOR, and was isolated as a site with high risk potential.

7 Kosovo Environmental Action Plan, 2006-2010, MESP, 2006.

Storage in Shirokë, 2009

Storage in Shirokë, 2010



Map 2. Storage of agriculture waste in Shirokë-Suharekë

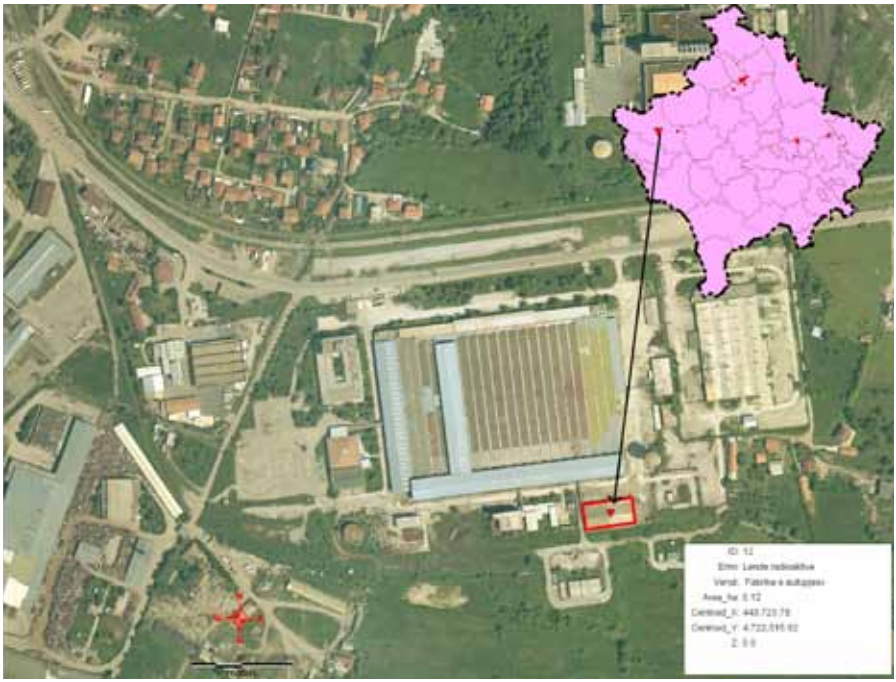
6.3.2 Storage of industrial chemicals in Pejë

The facility where the dangerous industrial chemicals are stored was a property of the former company of auto spare parts "Peja". After the war, industrial chemicals are collected by KFOR units, and stored in this facility. Although KFOR has information on the origin, quantity, type and risk of these substances, the Municipality of Peja and MESP does not possess full information about these substances, and their impact on the environment and public health. Currently the facility is monitored constantly by KFOR and KSF.

Storage of industrial chemicals in Pejë

The picture shows for hundreds litres of dangerous chemicals

Storage of dangerous industrial chemicals in Pejë



Map 3. Storage of industrial chemicals in Pejë

Table 4. Hotspots from hazardous chemicals in Suharekë and Pejë

Nr	Site	Activity	Surface	Potential Pollution Sources				
				Heavy metals	Chemical substances	Oil products	Organic matters	Others
1	Storage of agricultural waste in Shirokë of Suharekës	Storage of hazardous agricultural waste	0.04 ha	-	x	-	-	-
2	Storage of industrial chemicals in Pejë	Storage of hazardous industrial chemicals	0.12 ha	-	x	-	-	x

6.4 Environmental impact of transport sector

The actual old motor vehicles in Kosovo, imports of oil and petroleum products of poor quality (with high amounts of sulphur), inadequate storage, are also a potential risk to human health and the environment.

The transport sector is one of the sectors that have serious negative impact on the environment, and on the quality of its components (air, water and soil). It also contributes to the fragmentation and degradation of habitat, landscape impacts, land use, and cultural heritage impacts[8]. At global level, transport is considered to have an impact on climate change.

In Kosovo, particular problem represent the sites of used vehicles, as well as inadequate storage of lubricants and fuels. There are hundred such locations in Kosovo, which are operating without meeting the required conditions, and without environmental permits.

Contamination by fuels- Railway in Fushë Kosovë

8 Kosovo Environmental Action Plan, 2006-2010, MESP, Prishtinë, 2006

6.4 Hotspots from sanitary landfills

Kosovo has inherited municipal waste landfills in many locations. Most of them are located without criteria and preliminary studies. Some of them despite that are closed, are not yet rehabilitated. Such locations are identified as hotspots with potential impact on the environment. More problematic are found regional landfills that were built after the war by various donors. Because of mismanagement, these landfills have become potential risk with impacts on air, water and soil.

There are 6 municipal and regional landfills in the territory of Kosovo, which are considered as potential hotspots, and which are located in: Prizren, Podujevë Obiliq, Mitrovicë, Gjilan and Pejë.

6.4.1 Sanitary landfill in Podujevë

This landfill is located in the municipality of Podujevë. Its size is 8.72 ha. The projected time duration is 15 years. Total capacity is 925 000 m^3, while monthly capacity 2000 T. The water recycling pumps, even though in good conditions are not operating. Wastewater resulting form the landfill is discharged at the nearby water streams, causing their contamination. This represents a permanent risk for citizens living in the vicinity of the landfill.

View from the landfill

Landfill lagoons

Mixture of surface and landfill waters

Map 4. Sanitary landfill in Podujevë

6.4.2 Sanitary landfill in Pejë

This landfill has an area of 4.85 ha. Although constructed according to standards, the current state, and the management of the landfill is poor. Wastewaters resulting from the landfill are mixed with the surface waters. The presence of heavy metals, chemicals, and oil products in this landfill, make this location to be a potential source of pollution. Malfunctioning of lagoon pumps, and uncovered landfilled waste, cause further deterioration of the situation in this landfill.

Views from sanitary landfill in Pejë

The stream of contaminated water from the landfill in Pejë, March 2012

Map 5. Sanitary landfill in Pejë

6.4.3 Sanitary landfill in Gjilan

This landfill collects wastes of the municipalities: Gjilan, Kamenicë, Viti, Novobërdë, Kaçanik, Shtimje and Ferizaj. Landfill size is 20.50 ha; projected time duration up to 15 years. Total capacity is 1.222 222 m^3, while monthly capacity 4000 t[9].

This regional landfill, though constructed according to the required standards, because of mismanagement, it is now transformed into a major environment pollutant in this location. The pumping system is not regularly functioning, resulting with the mixing of landfill wastewater with the nearby surface waters.

The settlements in the eastern part of the landfill that are very close, as a result of contamination from the landfill, are unable to use the surface and ground waters. Also the smell coming from the landfill has made very difficult the life of the local population.

9 Report-State of waste in Kosovo, 2008

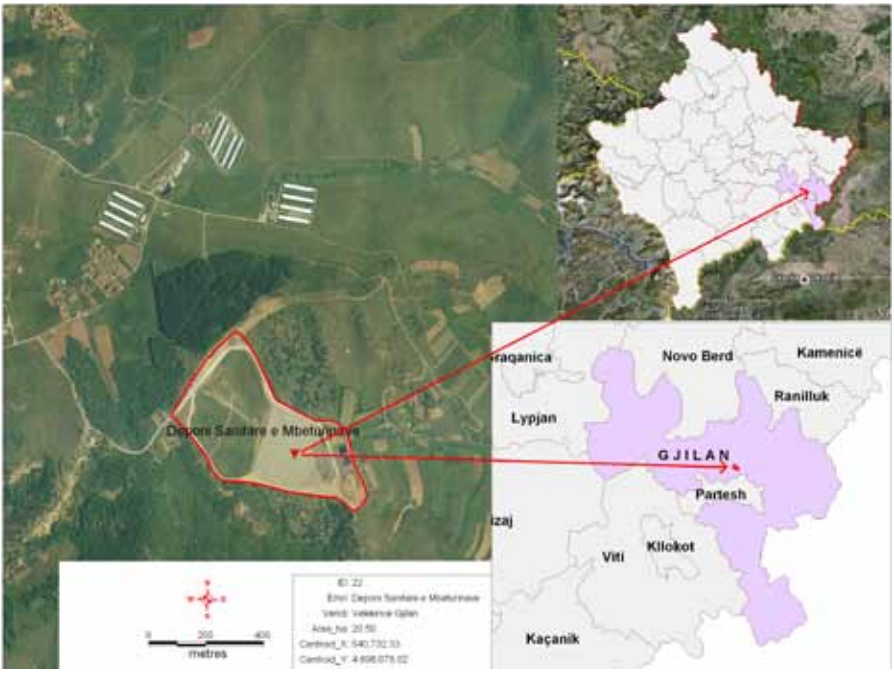
Waste water collected at the sanitary landfill in Gjilan

Settlement near the landfill

The water spring contaminated by the landfill

Contaminated water spring

Wastewater flow from the landfill



Map 6 . Sanitary landfill in Gjilan

6.4.5 Landfill in Prizren

The landfill has 14 ha, and is located in the village Landovica of Prizren. It was constructed in 2004, with the support of EU funds. As a result of mismanagement, the water pumping system is not functioning. Also the lagoon, which collects the landfill wastewaters, is opened by the erosion, which may result with discharge of wastewater from landfill to surface and ground waters, and harming the residents living in the vicinity of the landfill. These waters are contaminated with different chemicals that come from various waste substances deposited in the landfill. Untreated waters, continuously flow from lagoons, and mix with surface water. Another problem is that the wastes deposited are not continuously covered.

Accumulated waters at the landfill

Wastewater flow

The cascade rifted from accumulated waters at the landfill.

Wastewater flow resulting from the landfill

Wastewater flow resulting from the landfill

Map 7. Sanitary landfill in Prizren

6.5.5 Sanitary landfill in Mirash

The landfill of Prishtina region is located in Mirash village of Obilic Municipality. In this landfill are deposited wastes collected by municipalities: Prishtinë, Obiliq, Lipjan, Fushë Kosovë and Gllogoc. The size of the landfill is 33.65 ha. The projected time duration is 15 years. Total capacity is 3,500, 000 m^3, while monthly capacity 6 000 T.

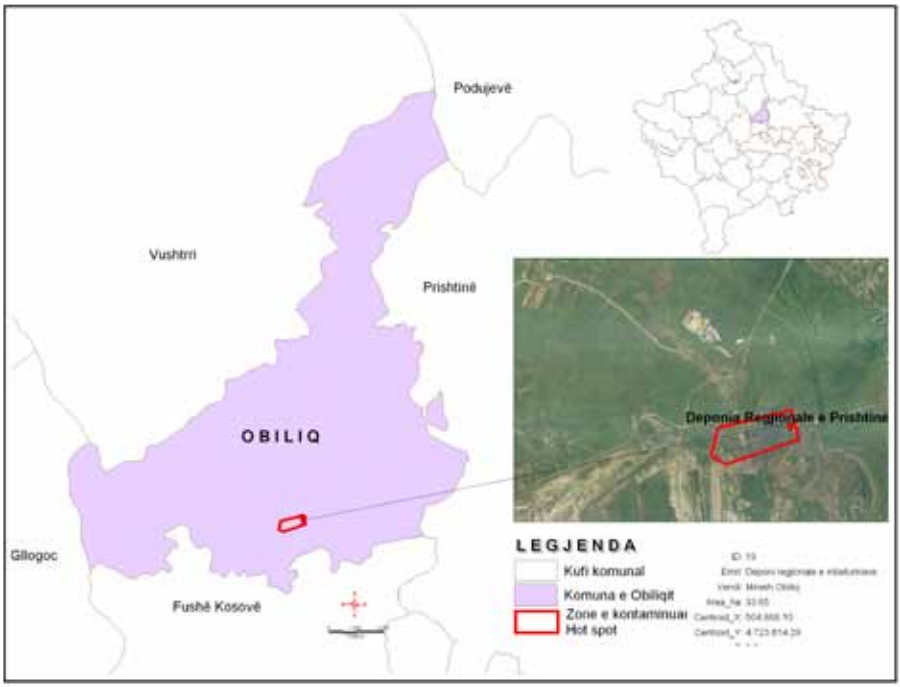
The landfill is located in an area where lignite is exploited for energy needs. This substrate is unstable, and the process of self-coal-burning made this location unsuitable for waste storage. Current landfill situation is quite heavy, due to improper location, and mismanagement of the landfill. Also the water pumps for treatment of water from lagoons are not in use since 2007. This caused the complete dry of the lagoons. Consequently, the landfill wastewaters and surface waters are mixed. A disturbing

phenomenon in this landfill is waste burning, that also affects air pollution in this location.

From this landfill a heavy odour is emitted, which represent a threat for spread of diseases and epidemics

View from sanitary landfill in Mirash

Waste burning in landfill in Mirash, 2011



Map 8. Sanitary landfill in Mirash, Obiliq

6.5.6 Sanitary landfill in Mitrovicë

In this landfill are collected wastes from municipalities of Mitrovicë, Vushtrri, Zubin Potok, and Skenderaj. Landfill area is 7 hectares. The projected capacity is for 250 000 inhabitants. Projected time duration is 15 years. Total capacity is 2,000,000 m^3, while monthly capacity 2400 T. This landfill is located near the village Gërmovë of Mitrovicë. The landfill was built with the support of governmental organization DANIDA. The situation of the landfill is heavy. As a result of mismanagement, the surface waters are mixed with those of the landfill. Contaminated waters that flow continuously out of the landfill, pose a potential risk to public health of the residents of this locality and the environment.

Sanitary landfill of urban waste in Mitrovica municipality

Sanitary landfill of urban waste in Mitrovica municipality

Table 5. Sanitary landfills as potential pollution sources in Kosovo

Nr	Location - site	Activity	Surface	Potential pollution sources				
				Heavy metals	Chemical substances	Oil products	Organic matters	Other
1	Sanitary landfill in Podujevë	Urban waste landfill	8.72 ha	x	x	x	x	x
2	Sanitary landfill in Sferk e Thatë-Pejë	Urban waste landfill	4.85 ha	x	x	x	x	x
3	Sanitary landfill in Gjilan	Urban waste landfill	20.50 ha	x	x	x	x	x
4	Sanitary landfill in Prizren	Urban waste landfill	20.94 ha	x	x	x	x	x
5	Sanitary landfill in Obiliq	Urban waste landfill	33.65 ha	x	x	x	x	x
6	Sanitary landfill in Mitrovicë	Urban waste landfill	3.60 ha	x	x	x	x	x

6.6 Hotspots from mining and industrial activities

Kosovo has had great industrial potential with different destinations. As a result, today a large number of inherited environmental problems is actual, which were accumulated during decades of uncontrolled exploitation of natural resources, mining activities and industrial production, associated with high pollution level.

After 1999, most of manufacturing industries were out of function. Most of these industries resulted with hazardous waste, old unused technology, demolished buildings, and unmanaged storages. All these contributed to increased environmental impact. Such locations of potential pollution from industry can be considered as hot spots, and with environmental impacts. These sites are a source of pollution of soil, water and air. Vast areas of land are contaminated by acidic water, and heavy metals, especially Lead, Zinc, Cadmium, Arsenic, Mercury etc.

During 2010, KEPA has made a research on the territory of Kosovo, and has recorded several former industrial facilities, and their storage areas (dumps) that currently pose a permanent risk to the environment and public health in Kosovo. Among the most affected municipalities by these hotspots are: Gllogoc, Mitrovicë, Suharekë, Zveçan, Graçanicë, Novoberdë, Obiliq, Lipljan, Gjakovë, Stanterg and Leposaviq.

Some of these industries have been privatized, and the new owners have done the partial rehabilitation of the environment around them.

6.6.1 Hotspots from industry sector

Ballkan of Suhareka, was considered among the most important industries for Kosovo economy. Like most other industries, this industry as well, has inherited different types of hazardous waste; such as used oils, waste conveyors, and other chemical waste that have contaminated the area in and around the facilities. Hazardous wastes were stored in this location up to 2009, where the site is turned into an industrial landfill (see photo).

Waste oils in "Ballkan" in Suharekë, 2009

Despite the measures undertaken for removal of hazardous waste from this site, even today some of them still remain stored in company facilities. The measures to rehabilitate the contaminated soil are not undertaken.

Burning of oils resulted from the production process, has contributed to the environmental contamination at the site. This has increased the environmental threat for the health of employees, and the population in nearby settlements.

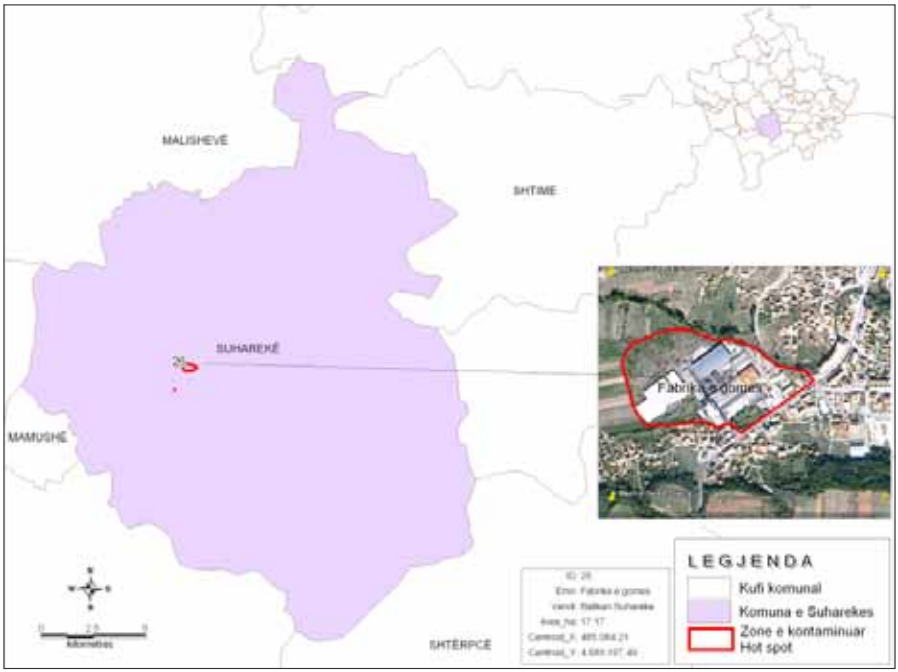
Waste oils remained from technological process.

After the privatization of the company, the new management has taken steps to improve the state of the environment in this location, by removing the recyclable waste, and by investing in other sectors, in order to improve the environmental situation.

"Ballkan" Suharekë, different types of mixed waste, March 2011

"Ballkan" Suharekë, July 2011

Although the pictures show that the waste oils in the company's yard almost have been eliminated, the problem has remained, because the land is contaminated by oils used for years. Although the management of the company has drawn up a plan for the rehabilitation of the space around the plant, there is no concrete project implemented in order to clean the contaminated soil.



Map 9. The "Ballkan" Plant in Suharekë

Table 6. Tires and conveyor belt production plant in "Ballkan" of Suharekë

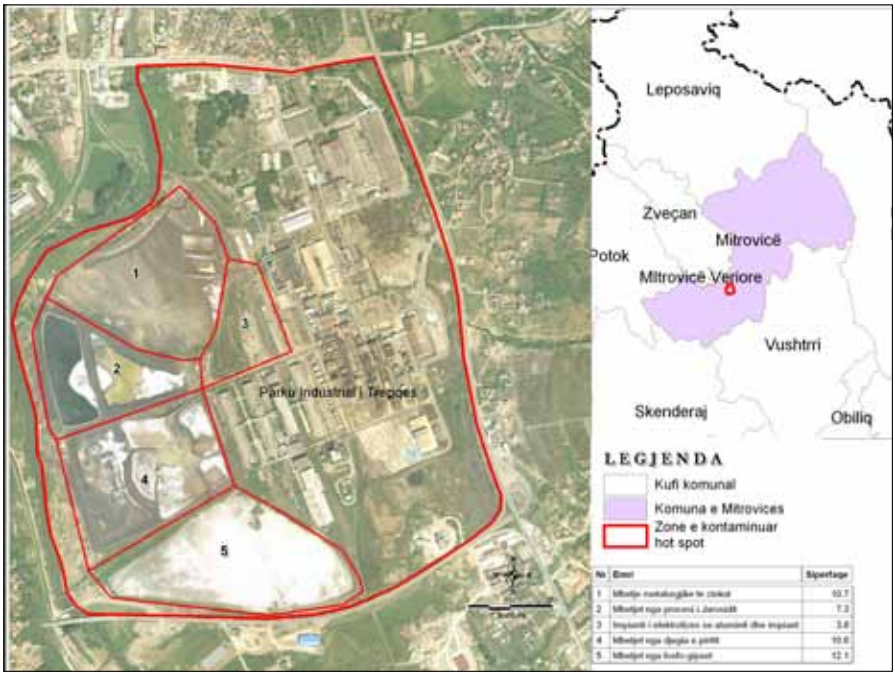
Nr	Location - site	Activity	Surface	Potential pollution sources				
				Heavy metals	Chemical substances	Oil products	Organic matters	Other
1	Tires and conveyor belt production plant in "Ballkan" of Suharekë	Residues from oils and conveyor belts	17.17 ha	-	x	x	-	-

6.6.1.1 Industrial park in Mitrovicë

Industrial park in Mitrovic**ë** is consisted of former Battery Industry, Zinc Metallurgy, and Chemical Industry. Within the chemical metallurgical processing of these industries, in addition to finalizing the products, they have created hazardous waste for the environment. These wastes are dumped in the vicinity of the park, thus created the industrial waste landfill, which is in a common space. This landfill is located on the west side of PIM›s, and in one side is bordered by the Sitnica River. The industrial waste landfill has an area of 34.62 hectares. Total mass of these industrial waste is estimated to be about 1 520 000 tonnes. The landfill consists of four types of industrial wastes, pyrites and pyrotine, phosphogypsum, jarosite and the so-called residue of neutral process of lye-ing the fried zinc, also known as the EMKO residue. Location of the landfill is inadequate, and with increased concern for its impact on the environment, in particular because the surrounding area is the area with settlements, and near the river.

Industrial dumps in industrial park of Mitrovica

Animals grazing in PIM area



Map10. Industrial Park of Trepça in Mitrovicë

6.6.1.2 Slag dump of Ferronickel in Çikatovë-Gllogoc

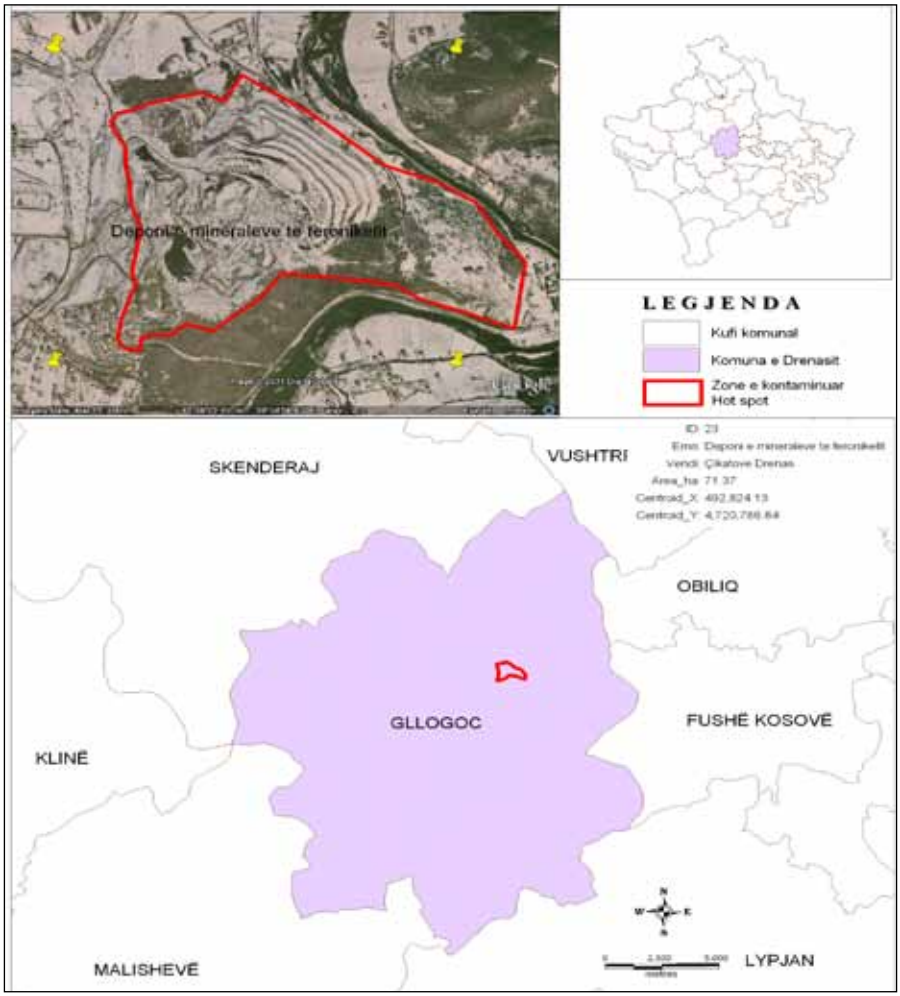
The "Feronikeli" industrial complex dates from 1984, and operated until 1998. Feronikeli Complex is now privately owned, and is considered as one of the largest enterprises in Kosovo. This heavy industry makes production of iron and nickel.

Residues of Ferronickel industrial production process are disposed off in an area near the Drenica River, by creating slag hill. The slag dump has an area of about 24 ha, whereas the impact area has 45 ha, thus considered as an area of great pollution potential. Besides the industrial waste of Ferronickel, in this site the urban waste of Gllogoc town are disposed off as well.

In average, 1 million ton m^3 of slag is generated within a year. The slag contains chemical substances such as SiO_2, MgO, FeO and CaO.

Dump site of urban and industrial waste in Çikatovë e Re

Dump site of industrial slag in Çikatovë e Re, Gllogovc



Map 11. Slag dump of Ferronickel, Gllogoc

Table 7. Slag dump in Çikatovë e Re, Gllogoc

Nr	Site	Activity	Surface	Potential Pollution Sources				
				Heavy metals	Chemical substances	Oil products	Organic matters	Others
1	Çikatovë e re, Municipality of Gllogoc	Slag residues of Ferronicksl	24 ha Impact area 71.37 ha	**x**	-	-	-	-

6.6.2 Hotspots from mining sector

Within the mining secto,r the following tailings (mine dumps) have been identified as potential hotspots: Hajvali, Badovc, Kishnicë, Artanë, Kelmend (for Stan Tërg mine), materials of Trepça Industrial Park in Mitrovicë, Zveçan tailings, Leposaviq taiings, ash dumps in KEK, flotation tailings in Devë-Gjakovë, Golesh mine in Magure-Lipjan, and asbestos dump in Hani i Elezit.

6.6.2.1 Tailings (Mine dumps) in Hajvali, Badovc dhe Kishnicë

This area is rich in natural resources, important for the economic development.

Badovci mine is one of the most important Lead and zinc area of Hajvali, Badovc and Kizhnicë ore field. It is located southeast of Prishtinë, in northern part of ore field. Ore field is located in the east of Kosovo neogene basin, between the geographical coordinates $21^{0}29''$east geographic longitude, and $42^{0}21''$ north latitude (according to Grinuic).

The Kishnica mine location and its industrial potential, represent an area of potential pollution, and can be considered as environmental hotspot. Exploitation in this area is accompanied by ore enrichment in flotation located nearby. This site is polluted by numerous tailings, scattered irregularly, and without any measure to prevent environment damage.

Exploitation of minerals in this location is made up to 90es, but flotation activity is not interrupted, because there was conducted enrichment of the ore exploited in Artana mine.

The mining complex includes an area of 100 ha. As hotpots in this complex are evidenced the following:

- Badovc tailings (near Badovc Lake dam), characterised with high concentration of heavy metals, such as Lead and Zinc. The tailings cover an area of about 1 ha;
- The sterile material tailings, Kizhnicë tailings, with lead and zinc concentration. This tailings cover area of about 5 ha;

The Badovci lake dam

The tailings near Badovci Lake dam

Map 12. Kishnica tailings in Badovc

Tailings of sterile material in Kishnicë

Tailings of sterile material in Kishnicë

Map 13. Tailings in Kishnicë

Rehabilitated tailings (mine dump) in Kishnicë

Table 8. Tailings of heavy metals in Kizhnicë, Graçanicë

Nr	Site	Activity	Surface	Potential Pollution Sources				
				Heavy metals	Chemical substances	Oil products	Organic matters	Others
1	Tailings near Badovc Lake dam, Kishnicë, Graçanicë	Content of Pb, Zn, Au	2.85 ha	x	-	-	-	-
2	Tailings of sterile materials, of Kishnicë mine, Graçanicë	Content of Pb, Zn, Au	10.23 ha	x	-	-	-	-
3	Tailings of heavy metals, Graçanicë (rehabilitated)	Content of Pb, Zn, Au	70 ha	x	-	-	-	-

6.6.2.2 Mine of Artana

Artana ore field lies in the Rhodope mountain area, in the eastern part of the country, and is known as mountainous areas of Artana and Gollak. This area lies on the eastern edge of Kosovo Plain, and is bordered with the Llap River in north, the Morava e Binçës River in south, and west with Kosovo plain. The Artana ore field covers most of Marec village. In administrative terms, the area of this field belongs to the municipalities of Gjilan, Kamenicë, Prishtinë and Artanë.

Former old city of Artana lies in the north-eastern part of Kosovo, about 25 kilometres air distance, respectively 40 km terrestrial line east of Prishtinë and about 30 km north of Gjilan.

Mountainous area of Artana and Gollak, respectively the Artana ore fields, lies in altitude of 800-1335m above sea level. This relief is result of paleo-geographical, geological, and tectonic evolution.

In this area, flow the Mareci River, Bostani River and Vitia River. The entire territory is characterized by natural water sources, which in most cases are located in old operating sites and galleries, which were opened in the past, but which currently are covered.

As a result of exploitation of minerals from Artana Mine, two tailings were created near the Krivareka River. These two tailings represent two typical environmental hotspots, and a pollution source of lead, zinc and sulphur.

Acidic waters of Artana mine10

10 Photo UNDP Kosovo

Rehabilitation of Artana tailings11

The two tailings are located in the following locations:

- Tailings Mareci 1, which has high concentration of lead and zinc, with an area of 2 ha. It is estimated that this landfill has approximately a residue quantity of 350,000 t;
- Tailings Mareci 2, which also contains heavy metals such as zinc and lead, and has an area of about 4 ha. This landfill is estimated to have approximately around 2,000,000 tons of waste.

The content of these dumps is heterogenic and they contain the heavy metals in the following percentage: Pb=1-1.56%, Zn=1.76-3.22%, Ag=20-110gr/t, Au=2-2.59gr/t, Fes^2=60-70%[12]

The tailings are located near Marec River, built out of mining technical regulations, and pollute not only in the location where they are, but also beyond. There are no stable dams, which are exposed to constant erosion. Even though a rehabilitation project supported by UNDP was implemented, still there are problems, and these taaialings are considered a serious environmental hotspot.

Artana tailings, Mareci 1

11 Photo UNDP Kosova

12 According to the data from the managers of Artanë-Kishnicë mining and flotation

Artana tailings -Mareci 1

Animals grazing near the Artana tailings - Mareci 1

The tailings Mareci 1, in addition to many technical problems created during the recovery process, even today is considered a problem, because the dump surface is covered by layers of soil, which is constantly exposed to erosion, and if actions are not undertaken, in the near future it will be returned into the previous state.

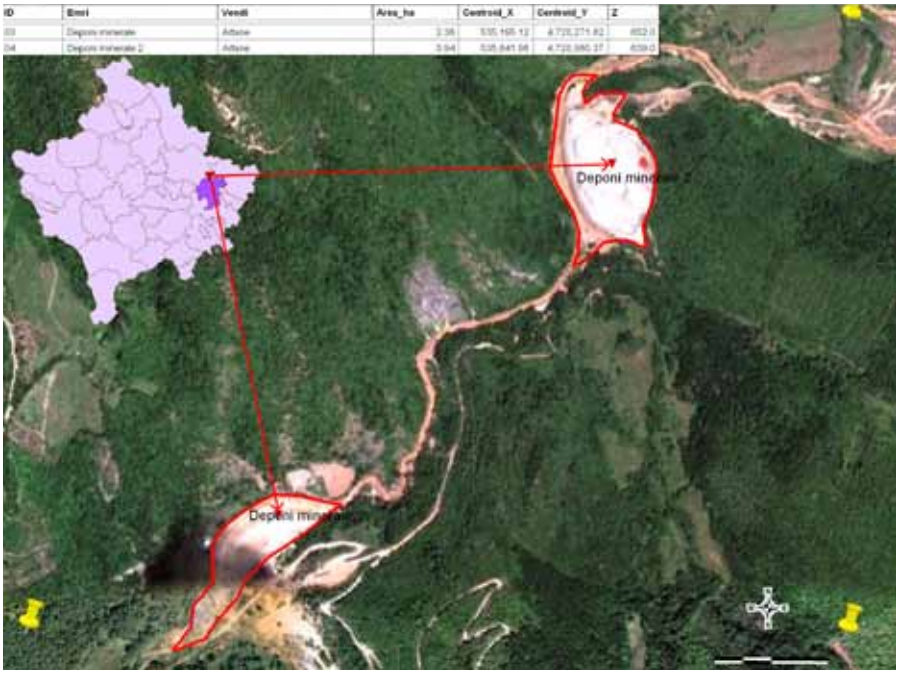
The Artana tailings, Mareci 2

Acidic waters flowing from Artana mine, tailings Mareci 2

The mine tailings Mareci 2, was rehabilitated by UNDP project as well. Despite the investment made on the rehabilitation, yet the tailings does not meet the required standards. Current status of the tailings, and its embankments is not good, and there are no safeguards for the protection of the river, and surrounding environment from pollution.

Table 9. Tailings in Artanë

Nr	Site	Activity	Surface	Potential Pollution Sources				
				Heavy metals	Chemical substances	Oil products	Organic matters	Others
1	Mareci 1 and 2	Tailings of lead and zinc	2.38 ha	x	-	-	-	-



Map 14. Tailings in Artanë

6.6.2.3 Mine of Stan Tërgut

The mine of Stan Tërg is located about 8 km northeast of Mitrovicë. It is considered one of the richest mines of Lead, Zinc and Silver in Europe. Since 2000, efforts are made to rehabilitate and to put into operation, with the help and support of the Kosovo institutions and some donors.

The biggest environmental problem from the mine is the contaminated mine water, which contaminates the surface and ground waters of surroundings. Another problem is the dust that comes from uncovered dumps of this mine.

In this area, the sites considered as environmental hotspots are: industrial waste landfill in Leposaviq-Bostanishte, industrial waste landfill in Zveçan-Zhitkovc, industrial waste landfill in Zveçan/Mitrovicë/Gornje Pole, industrial waste landfill at "Tuneli i pare", industrial waste landfill in Badovc-Potok, industrial waste dump (ash deposit) in Zveçan, industrial waste landfill in Mitrovicë, and the waste remained from minerals melting plant in Zveçan

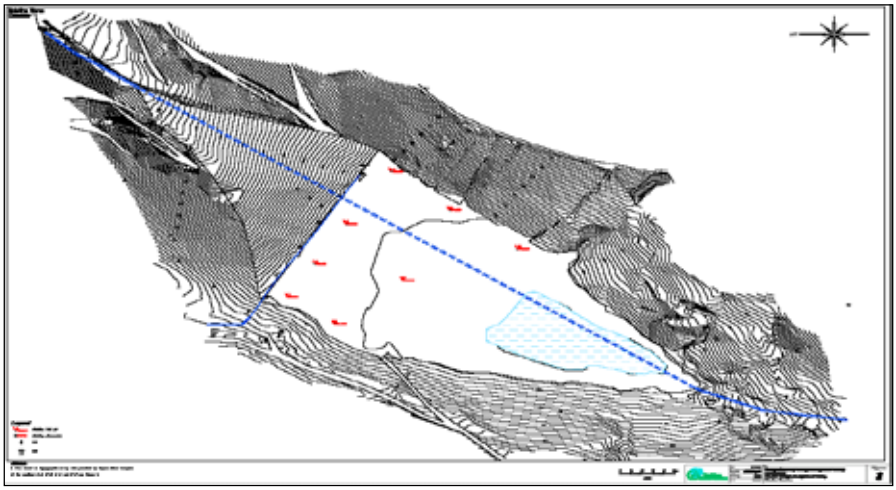
6.6.2.4 Tailings in Kelmend

The region where the tailings (mine dump) are located, belongs to Trepça ore field. It is composed of magmatic rocks and metamorphic sedimentary rocks of new Palaeozoic and Triassic, ultra-maphites, volcanogenic-sedimentary formation of upper Jurassic, upper Oligocene series products, lake creations of Miocene Pliocene, and Quaternary creations. Tailings extend over an area which has the geological composition of the volcanic-quartz-latite structures, andesite and Neogene masses; silikor-diabase formations of Jurassic, and Triassic limestone creatures.

During the construction of the dump, drillings have been conducted, and no ground water was confirmed in the area. There are no rivers near the dump, so only atmospheric waters, and waters coming from the flotation enter the dump, along with residues from flotation process of ore in the "Tuneli i Pare". This water creates a lake, and then after physical treatment, through the collector flows into the Ibri River. The waters coming from the mine underground, with a flow of 300 m^3/h are discharged in the water stream at "Tuneli i parë" and together with water released from flotation process enter the tailings (dump site).

The mine dump that collects the materials remained from flotation process has an area of about 18 ha. Although some works for maintenance of this dump were carried out, still this site remains the greatest risk for the local residents as well as for the environment.

A particular problem that relates to this tailings is the fact that during strong wind, dust particles will be transferred to a larger space causing air, water, and soil pollution.



Map15. Topography of tailings (mine dump) in Kelmend - Mitrovicë [13]

The dam of the tailings in Kelmendi

13 Elaborat o izversenom ugradjivanju pijezometra na glavnoj brani jalovista flotacije rudnika „Trepca"-Stari Terg na Zarkovom Potoku (Kelmend) -1983

Water accumulated (lake) in the tailings in Kelmendi

Warning table for risk from the industrial waste dump

6.6.2.5 Radioactive materials at "Tuneli i pare"- Mitrovicë

In Trepçë, respectively in the "Tuneli i Parë" three barrels with radioactive substances are located, which are brought by French KFOR. Radioactive substances are: americium (one barrel), strontium and thorium (one barrel). Also, there is another unknown matter in salt form, but at the KFOR report, there is no information on this. These radioactive materials are placed in special storage, and are under the supervision of KFOR. According to the report on the measurement of radioactivity of these materials, made from Multinational Brigade North-East of 26 March 2005, N^0 02/BMN-Ne/Em/G32D/NBCRT, only americium exceeds the permissible dose of 2.5. $\mu Gy/h$.

Storage of radioactive materials

Radioactive materials of Americium, Strontium and Thorium

6.6.2.6 Radioactive materials in Industrial Park of Trepçë, Mitrovicë

In the central laboratory of "zinc metallurgy" are stored 12 cans of Thorium Nitrate, weighing close to 1.2 kg. Radiation rate is around 9 $\mu Gy/h$, and according to the standards, the allowed is 2.52.5 $\mu Gy/h$.The origin of this substance is unknown. It is placed in a metal safe, and is marked with the sign of radiation risk, which is monitored by French KFOR.

Laboratory premises

Radioactive materials stored at PIM laboratory

6.6.2.7 Tailings in Zveçan

This tailings are created as a result of Lead and Zinc ore processing in the old flotation in Zveçan. Otherwise, this is known as tailings of sterile in Gornje Pole. It is located near the lead smelter plant in Zveçan, very near the Ibri river. The surface of this dump is about 50 ha, the quantity of stored sterile is estimated to be around 12 million t[14].

In Zhitkovc, 2 km from Zveçan is located another tailings of sterile from old flotation of Zveçan. It has a surface of 26 ha, with a quantity of sterile of about12 million ton. The chemical composition of the sterile in Zhitkovc is same with the one of Zveçan. This dump site is rehabilitated with the support of European Commission, with a donation of about 1 million Euro.

In the lead smelter plant in Zveçan, during reductive smelting of lead agglomerate in high furnaces, the Lead slag remained. This residue is also located in the tailings of sterile in Zveçan. The amount of slag in Zvecan tailings is estimated to be about 2.6 million tonnes, and covers an area of about 5 ha.

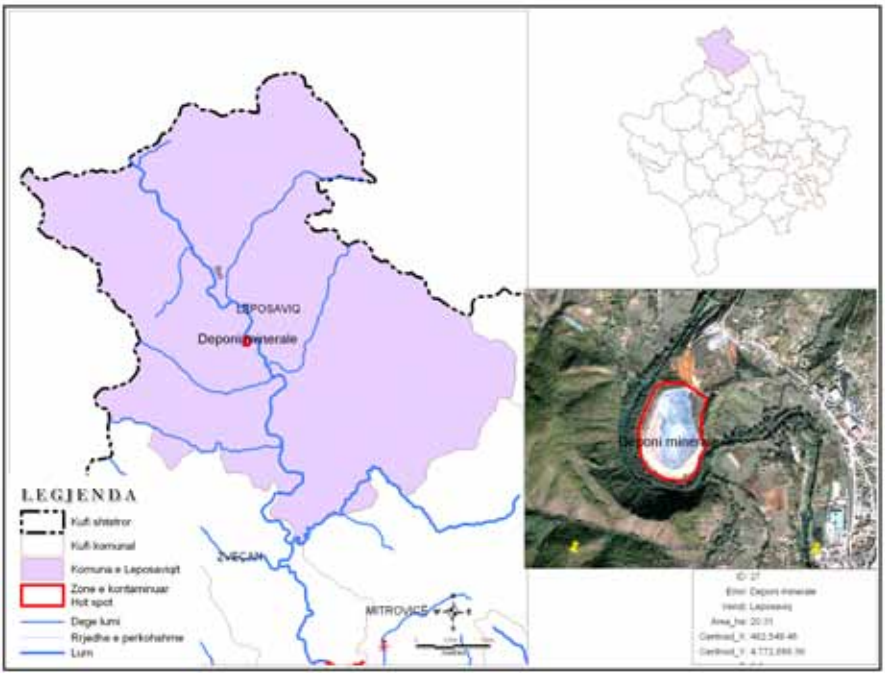
Tailings in Zveçan

14 Assessment from EAR , 2002

6.6.2.8 Tailings in Leposaviq

Two tailings are located near the flotation in Leposavic. One is active, and the other is closed. In the active tailings are disposed off about 3.7 million tons of waste from flotation, whereas in the closed one, around 2.7 million tonnes of waste.

Tailings in Leposaviq

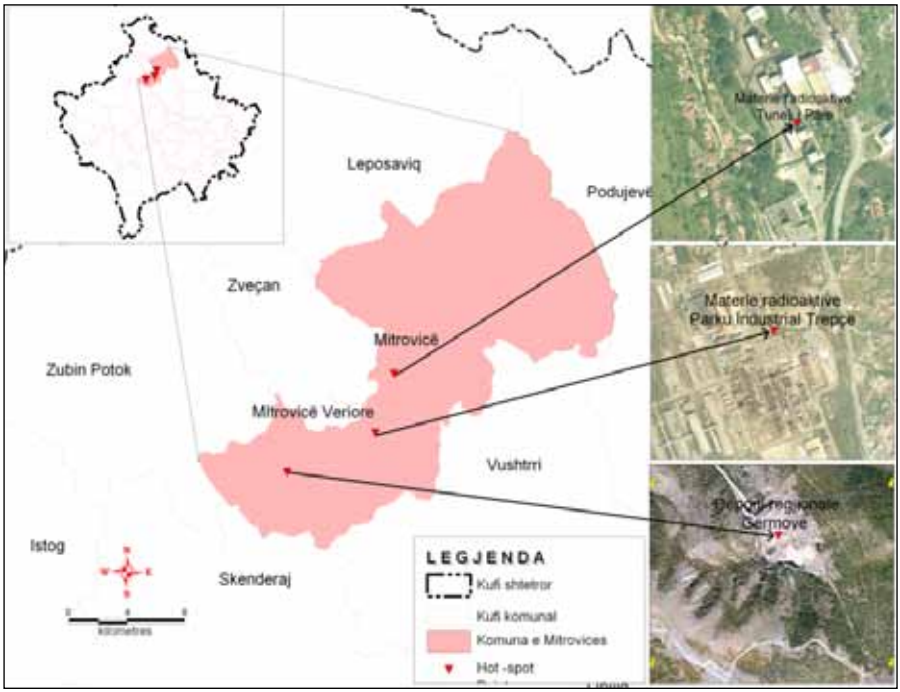


Map 16. Tailings of flotation in Leposaviq

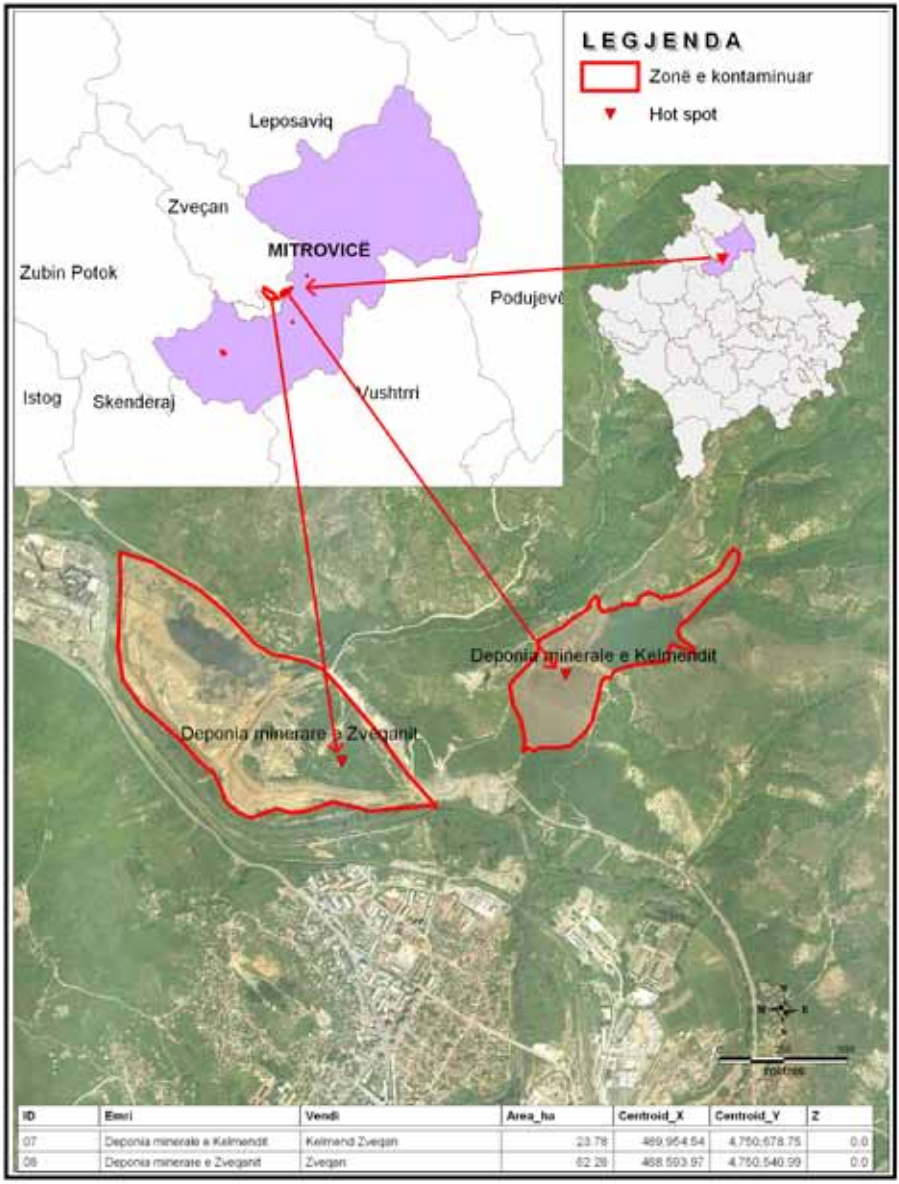
Table 10. Chemical composition of tailings with heavy metals in northern part of Kosovo[15]

Location	Gornje Polje	Zhitkovc	Leposaviq	Leposaviq	Zveçan
Current status	Closed	Closed	Closed	Active	Closed
Tipi	Tailings of sterile	Tailings of sterile	Residues from flotation	Residues from flotation	Tailings of granulated sterile
Quantity in ton	12	9	2,7	3,7	2,6
Chemical composition of residues					
Al_2O_3 %	1,6		2,8		0,02
Bi mg/kg	17		<10		25
Cd mg/kg	<10		18		
Cu %	0,013		0,012		
Fe_2O_3 %	32		24		29
MgO %	<1		3,9		
Ni %	0,023		0,079		
Pb %	0,21		0,33		2,0
Zn %	0,14		0,26		
ZnO %					7-12
Ag g/t	12				256
SiO_2 %					18-20
CaO %					20-22

15 Assessment from EAR, 2002



Map 17. Radioactive materials at "Tuneli i pare", PIM laboratory, and the sanitary landfill in Germovë-Mitrovicë



Map 18. Tailings in Zveçan and Kelmend

Table 11. Industrial landfills of heavy metals, and radioactive materials stored in Mitrovicë

Nr	Site	Activity	Surface	Potential Pollution Sources				
				Heavy metals	Chemical substances	Oil products	Organic matters	Others
1	PIM	Residues of heavy metals from zinc metallurgy, jarosite process, the plant of fertilizers, battery, zinc electrolyse, pyrite burning, and residues of phosphor-gypsum	115.10 ha	+	+	-	-	+
2	PIM	Storage of radioactive materials of Thorium nitrate	0.04 ha	-	-	-	-	+
3	Tuneli i Parë	Storage of radioactive materials: Strontium, Thorium dhe Americium	0.03 ha	-	-	-	-	+
4	Industrial landfill in Zveçan	Dispose off of heavy metals	62.28 ha	x	-	-	-	-
5	Industrial landfill Leposaviq	Dispose off of heavy metals	20.31 ha	x	-	-	-	-

6.6.2.9 Ash dumps in KEC

The ash dumps of Thermal Power Plant Kosovo A are located near Mirash village of Obilic municipality. They cover an area of about 110 ha. In addition to dispose off of ash resulted from coal combustion for electric energy production, in this dumpsite the coal slag is disposed off as well. In addition to the large amount of ash deposited, this location represents permanent risk due to instability of deposited ash, which is characterised by occasional slides. The ash removal by wind presents another problem that is characteristic of this hotspot.

TTP A and ash hills

Ash collected in these dumps is created during the combustion of coal for electricity generation. Transportation of ash from TPP A in existing dumps is done through open conveyor belts. Ash from TPP B, through pipes and hydraulic system is disposed off in the spaces of exploited mine in Mirash. Open storage of ash in TPP A results in the spread of dust in the air, and pollution of surface and groundwater in the area.

Table 12: Content of ash disposed off in ash dumps of KEC[16]

Ash contents	%
SiO2	38
Al_2O_3	6.8
Fe_2O_3	5.4
CaO	35
MgO	18
SO_3	8.3

16 Report, State of waste in Kosovo, KEPA 2009

Ash dump of TPP A

Ash dump of TPP A, air pollution from dust

Settlement near TPP A in Mirash

Table 13: Coal ash dump sites of KEC[17]

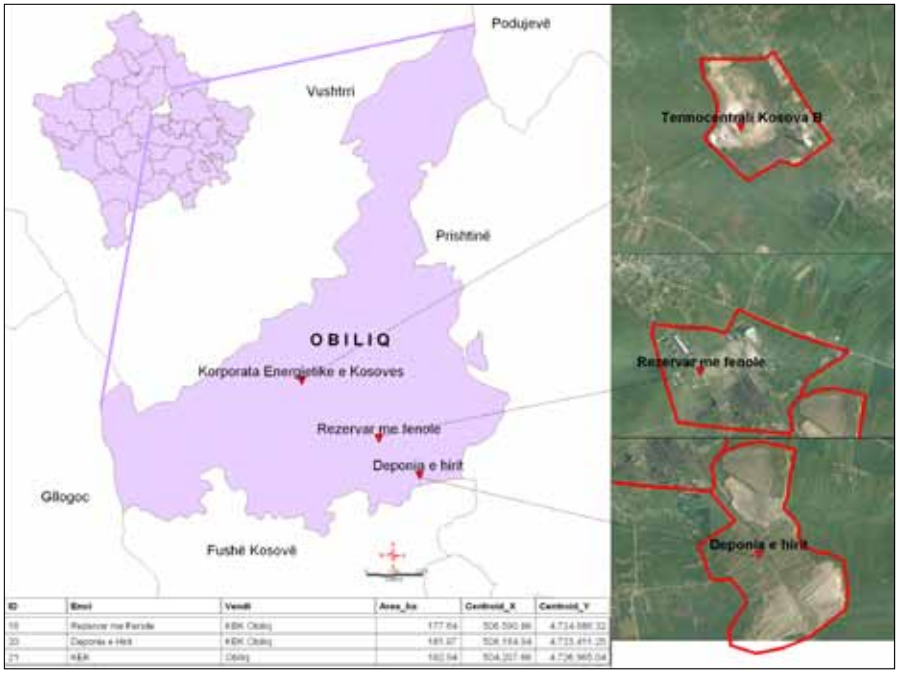
Name of dump site	Surface	Annual quantity	Volume	Weight in mil.ton
Dump of TPP A	181.97 ha	0,87 mil.m^3/year	25 mil.m^3	34 mil.t
Dump of TPP B	192.92 ha	0,93 mil.m^3/year	14 mil.m^3	20 mil.t.

Other locations of potential pollution in KEC area are the first units of TPPA and TPPB (TPP A1 and TPP B1). High concentration of heavy metals, chemicals, and used oils are evidenced in these units.

17 KEC services, Environment Department-Report 2009

Table 14. Ash dump sites and phenol tanks in KEC

Nr	Site	Activity	Surface	Potential Pollution Sources				
				Heavy metals	Chemical sub-stances	Oil products	Organic matters	Others
1	Ash dump of TPP Kosova A	Ash dump	181.97 ha	-	x	x	-	**x**
2	Ash dump of TPP Kosova B	Ash dump and TPP Kosova B	192.94 ha	-	x	x	-	**x**
3	Phenol tanks, TPPA, and areal of impact	Phenol tanks and the impact	177.64 ha	-	x	x	-	**x**



Map 19. Ash dump of TPP- B, phenol tanks, and ash dump of TPP-A

6.6.2.10 Tailings of flotation in Devë, Gjakovës

The chrome ores located in the central part of the massif of Gjakova in the territory of Devë. There are many, but small chrome ore fields. The most important fields are those in the eastern part of the massif, between villages Petkoviq and Labuçevë. Chemical composition of chrome ore is: Cr_2O_3-35-55%, Al2O_3-8-23% and FeO around 13%[18]. Extraction and enrichment of ore in the enrichment plant in Devë has also created the respective tailings. This tailings cover has an area of 1 ha. It is estimated that the tailings poses a potential source of heavy metal pollution, and poses a threat to the environment and water flows in the area.

Tailings of flotation in Devës, Gjakovë

Tailings of flotation in Devë, Gjakovë

18 Elaborat o Istražnim Radovima na Djakovičkom Serpentinitskom Masivu u Toku 1969 Godine – ICMM Reg.-No. 0004/A

Map 20. Tailings of flotation in Devë, Gjakovë

Table 15. Tailings of flotation in Devë, Gjakovë

Nr	Site	Activity	Surface	Potential Pollution Sources				
				Heavy metals	Chemical substances	Oil products	Organic matters	Others
1	Chrome mine flotation in Devë	Landfill of heavy metals	5.23 ha	x	-	-	-	-

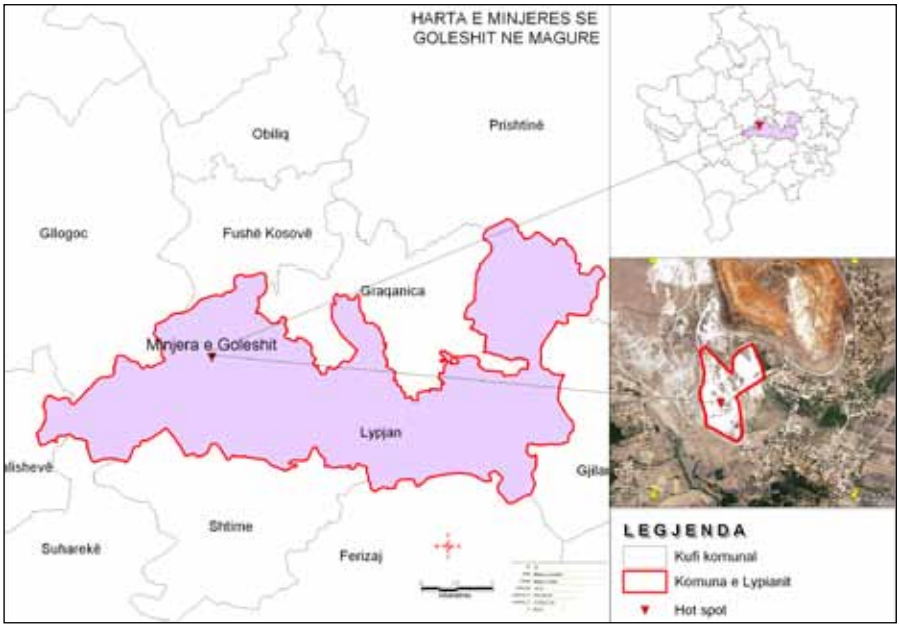
6.6.2.11 Mine of Golesh in Magurë- Lipjan

In Golesh and Strezovc are located two mines of magnesite (MgCO3). Both of these mines have operated until1999. According to some estimates, in 1990, in Golesh were produced about 110000 tonnes of magnesite, 22000 tons of magnesium, and 10,000 tons of caustic calcined magnesium per year. The mine in Golesh is operated through a mineral well, while the mine in Strezovc through a gallery[19].

This mine has an area of 15.13 hectares, and represents a potential source of contamination by heavy metals, magnesium and waste oils.

19 www.kosovo-mining.org

View from mine in Golesh



Map 21: Mining industry of Golesh in Magure, Lipjan

Table 16. Residues from Golesh mine in Magure, Lipjan

Nr	Site	Activity	Surface	Potential Pollution Sources				
				Heavy metals	Chemical substances	Oil products	Organic matters	Others
1	Mine in Golesh, Municipality of Lipjan	Mine of magnesite and heavy metals	15.13 ha	X	-	x	-	-

6.6.2.12 Storage of asbestos materials in Hani i Elezit

As a result of cement production by Cement Factory, and Factory for production of salonit in Hani i Elezit, two asbestos waste landfills were created. A considerable amount of asbestos waste is disposed off on both sides of the river, in an area of 0.50 ha. Only on the left side of the river, the asbestos waste covers an area of about 0.18 ha. This site is located behind Cement Factory "Sharrcem", and behind the factory for production of salonit near the Bridge of Lepenc River.

Another location of asbestos waste disposal is the one between the city stadium and Lepenc River, which has an area of 0.42 ha. In addition to asbestos waste, the construction waste, and the municipal waste are disposed off in this site as well.

Asbestos wastes are disposed off at these locations after 1999, and their presence poses a danger to the environment, and in particular to Lepenc River ecosystem.

Yet, there is no study that would show for the exact type of asbestos waste, but it is estimated that these residues may be of several types, such as fiber type, or powder type such as: crocidolite or blue Asbestos, Actinolite, Anthophyllite, Chrysotile, white Asbestos, Amosite or gray asbestos, and Tremolite.

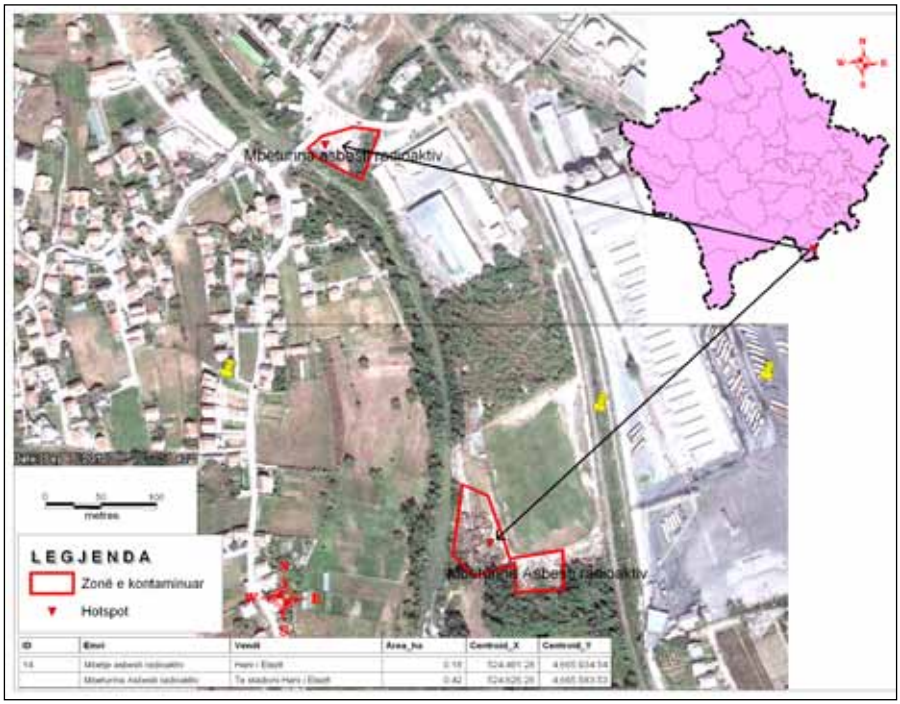
To improve the situation, and reduce the risk, treatment of these residues and more appropriate storage is needed.


Sharcem factory


The water stream polluted by SharrCem *Factory for production of Salonite*


Storage of asbestos waste materials near the bridge of Lepenc River


The dump with asbestos waste, and other types of wastes near the city stadium.



Map22. Storage of asbestos residues in Hani i Elezit

7. Summarized data on hotspots

In the following table are presented summary data for all potential hotspots identified. The data presented show that the majority of potential hotspots are from industrial, and mining activities, some of which are still active, and others that are not active, but that owns hazardous substances, or contaminated areas.

Table 17: Environmental hotspots according to location, activity, surface and potential pollution sources

Nr	Site	Activity in the past	Surface	Potential Pollution Sources				
				Heavy metals	Chemical substances	Oil products	Organic matters	Others
1.	The facility of ex Agriculture enterprise in Shirokë-Therandë	Storage of pesticides and fertilizers	0.04 ha	-	+	-	-	-
2.	The facility of ex factory of auto spare parts in Pejë	Storage of hazardous industrial chemicals	0.12 ha	-	+	+	-	-
3.	Municipal sanitary landfill in Podujeve	Waste landfill	8.72 ha	-	+	+	+	+
4.	Municipal sanitary landfill in Pejë	Waste landfill	4.85 ha	-	+	+	+	+
5.	Regional sanitary landfill in Gjilan	Waste landfill	20.50 ha	-	+	+	+	+
6.	Regional sanitary landfill in Prizren	Waste landfill	20.94 ha	-	+	+	+	+
7.	Regional sanitary landfill in Mirash-Obiliq	Waste landfill	33.65 ha	-	+	+	+	+

8.	Municipal sanitary landfill in Mitrovicë	Waste landfill	3.60 ha	-	+	+	+	+
9.	The tires and conveyor production plant-Suharekë	Waste oils and soil contamination	17.17 ha	-	+	+	-	-
11.	Industrial Park in Mitrovicë	Industrial landfill	115.10 ha	+	+	-	-	-
12.	Slag landfill of Ferronickel-Çikatovë-Drenas	Landfill of industrial slag of Ferronickel	24 ha are, impacted area 71.37 ha	+	-	-	-	-
13.	The tailings near the dam, Badovc	Landfill of heavy metals	2.85 ha	+	-	-	-	-
14.	Tailings of sterile material in Kishnicë	Landfill of heavy metals	10.23 ha	+	-	-	-	-
15.	Tailings Mareci 1 and Mareci 2, the water stream, Mine in Artanë	Landfill of heavy metals	2.38 ha	+	-	-	-	-
16.	Tailings in Kelmend-Mitrovicë	Landfill of heavy metals	23.78 ha	+	-	-	-	-
17.	Radioactive materials in the industrial complex Trepçe - Mitrovice	Storage of radioactive materials – thorium nitrate	0.04 ha	-	-	-	-	+
18.	Radioactive matters at "Tuneli i Parë", Mitrovicë	Storage of radioactive materials –Strontium, Thorium and Americium	0.03 ha	-	-	-	-	+
19.	Industrial landfill in Zveçan	Landfill of heavy metals	62.28 ha	+	-	-	-	-
20.	Industrial landfill in Leposaviq	Landfill of heavy metals	20.31 ha	+	-	-	-	-
21.	Ash dump in TPP A	Industrial landfill	181.97 ha	+	+	+	-	+
22.	Ash dump in TPP B	Industrial landfill and the impact areal	192.94 ha	+	+	+	-	+
23.	Phenol tanks	Storage of phenol	177.64 ha	+	x	x	-	**x**
24.	Mine in Devë-Gjakovë	Landfill of heavy metals	5.23 ha	+	-	-	-	-
25.	Mine in Golesh-Municipality of Lipjan	Exploitation and processing of heavy metals	15.13 ha	+	-	+	-	-
26.	Industrial complex of SharrCem, Hani i Elezit	Two landfills of asbestos materials	0.60 ha	+	+	-	-	+

Table 17 shows the potential hotspots, according to the activity by which are created. The table shows that most of these hotspots are repre-

sented by mining activities, represented with landfills (26.6%), ash landfills (30.1%) and industrial landfills (27%). In total, all the identified potential hotspots in Kosovo, cover an area of 0.09% of total Kosovo territory.

Table 18. Table of all hotspots, activity, surface and percentage

Nr.	Activity	Surface in km²	Percentage from total of hotspots	Percentage from total Kosovo territory km²
1	Tailings	2.66	26.6	0.024
2	Ash dumps	3.01	30.1	0.027
3	Industrial landfill	2.7	27.08	0.024
4	Waste landfill	0.93	9.3	0.008
5	Radioactive materials	0.67	6.7	0.006
	Total	9.97	100	0.091

Regarding the spatial distribution of potential hotspots, the largest number is located in central part, and in the northern part of Kosovo.

Map 23. Potential hotspots in Kosovo

8. Effects of hotspots in health and environment

Environment is of great importance for physical, mental, and social welfare of human society. Complex relationships between environmental factors and human health, taking into account multiple interactions, should be viewed in a broader spatial, socio-economic, and cultural context. Environmental degradation through air pollution, noise, chemicals, water quality, and loss of natural areas, combined with changes in lifestyle, may greatly affect the quality of human health[20].

Exposure to chemicals is associated with decreased function of genital organs, genital mal-formations, mental development problems, obesity, and cancer diseases. Also, another concern for environment and human health are the electrical and electronic waste, which contain heavy metals, persistent and bio-accumulating compounds. Same is for chemicals and other substances used in plastics, textiles, cosmetics, pesticides, and packages. Even chemicals that are used for fire extinguishers, such as Brominates, Phthalates, Biphenyl A, and perfluorinated chemicals have negative effects on health.

Based on a survey of 2009, In the EU rapid alert system for dangerous non-food products, (which has been operating since 2004), chemical hazards are represented by 26% of the total reports. In the European Union, there is a regulation on the registration, evaluation, authorization and restriction of chemicals (REACH), which aims to improve the protection of human health and the environment from the hazards of chemicals.

When it comes to pesticides and fertilizers, it is known that they disrupt the biological processes in the environment. Pesticides which may reach the human body through the food supply, water and land environments, affect the nerve transmission hormones or mimicry. Therefore, the EU Strategy for Sustainable Use of Pesticides sets targets to minimize the damages and risks to health and the environment from pesticides, and to improve control over pesticide use and distribution. Full implementation of the Directive of pesticides is needed to support the achievement of good chemical status under the Water Framework Directive[21].

20 European Environment State and Outlook 2010, synthesis

21 Water Framework Directive

European environmental policies are intended to provide an environment, in which the level of pollution does not generate harmful effects on human health. Within these attempts are also the 6th Environment Action Programme (EAP-6), the EU Environment and Health Strategy, Action Plan 2004-2010, and the Pan-European program of the WHO for Environment and Health.

Hotspots located in different environments, reflect direct effects on health and environment. Researches and studies in this field are scarce. There have been some researches and studies by UNDP, WHO, the Ministry of Economic Development, the University of Pristina, etc.

Researches and studies are done mostly in the Mitrovicë region, which is known for high presence of lead in the blood of the people of this region, because of metallurgical industrial waste from heavy industry inherited over the years.

One of the researches on population of camps in Mitrovicë is conducted by WHO. Camps are located only about 3 km away from the place, where the Trepca lead smelting was occurred in the past, and about 500 m from the mine waste.

According to this research, the health status of population of the camps is quite heavy, because of lead effects in blood. And this is particularly noticeable in children and pregnant women. Study on health effects of contamination from Trepça industrial landfills was conducted in 186 persons, during the period December 1999 to July 2007.

The impact of this contamination on health of population in this region has resulted in the appearance of chronic diseases, blood circulatory system diseases, side effects of children as damage to liver, kidney, brain, abnormal growth, affected pregnant women, delays in child development, the introduction of abnormal behaviour, poor impulse reaction, hearing loss, etc.

It should be highlighted that the high level of lead in blood (> 75 mg/dl), can even cause convulsions, coma and death. Negative effects are evident especially among young people and children[22].

Another study conducted in the same region was carried out by Dekonta.a.s, a Czech consulting company, specialised on environmental assessment and remediation. According to the results, the population of Mitrovicë had significantly higher levels of lead in the blood, than other

22 The European Journal of Public Health Advance Access published November 6, 2009, European Journal of Public Health, 1–5, The Author 2009. Published by Oxford University Press on behalf of the European Public Health Association. All rights reserved. doi:10.1093/eurpub/ckp164

regions. For example, the population of Mitrovicë had the highest concentration of lead in the blood for several times, comparing to Pristina.

The study shows that in 12% of children living in Mitrovica, blood lead level exceeds 70 µg / dL, and that 35% of children have resulted with the concentration of 50-69 µg / dL. It is also estimated that approximately 9 000 children in Mitrovica may have blood lead concentration of 40 µg / dL.

The level of blood lead concentration was found about three times higher among pregnant women in Mitrovicë region than those of Pristinë region. Therefore the Mitrovicë Industrial Park is considered one of the most "hot" spots, not only in Kosovo but also beyond[23].

23 Final report – draft, PS 2009-07, DEKONTA, a.s. joint- stock company Consulting services for Environmental Assessment and Remedial nga Republika e çekis, October, 2009

9. Conclusions and recommendations

Based on the results and data presented in this report, it may be concluded as follows:

- There are 28 potential environmental hotspots evidenced in Kosovo;
- Some of them, such as sanitary landfills, with a better management, might be minimised the environmental impact, and removed from the list of hotspots;
- Majority of hotspots belong to the industry and mining sectors and are contaminated with heavy metals;
- There has been a small number of projects implemented on rehabilitation of hotspots, in particular rehabilitation of landfills with heavy metals;
- There is a small number of studies on the effects of hotspots on health, with exception of some researches in Mitrovicë region, conducted by various local and international institutions;
- The population has little knowledge on environmental hotspots and related risks;
- Little efforts are made on awareness of population related to the risk from environmental hotspots;
- There is no specific strategy for addressing the issue of environmental hotspots in Kosovo;
- There are no programs for rehabilitation of environmental hotspots;
- Comparing to the needs and large number of hotspots, very few investments are made on rehabilitation of environmental hotspots;
- There is insufficient cooperation among institutions on coordination of actions for resolving the problem of environmental hotspots;

As a result, the following measures are recommended:

- Conduct more in-depth analyses and specific studies for each hotspot presented in this report;
- Conduct and environmental impact assessment for each environmental hotspot;
- Develop special programs for monitoring of surface waters, ground waters, soil, and impacts from environmental hotspots;

- Review and consider reforming the actual management system of urban, industrial, and mines landfills;
- Develop strategies and plans for rehabilitation of environmental hotspots;
- Fundraise for rehabilitation of environmental hotspots;
- Improve cooperation between central and local institutions, for the purpose of coordination of activities to reduce environmental hotspots;
- Municipalities should initiate the Local Plans for hotspots, in order to prioritize their management priorities, and development of projects for rehabilitation;
- During privatization process, the environmental problems inherited from the past (hotspots) should be addressed; the new owner should take responsibility for rehabilitation of those sites;
- To start the implementation of the IPPC law;
- Develop more efficient and sustainable policies for resolving the issue of environmental hotspots;

For mitigating the problem of hotspots, the following measures should be undertaken in the future:

Industry and mining sector

- The industry and mining sectors should take measures for integration and implementation of environmental management systems, and cleaner technologies (BAT) to prevent pollution (reduction of toxic substances, reduction of waste, more efficient use of energy, and to minimize expenses)
- Insure appropriate management, and adequate storage of hazardous wastes (chemicals and heavy metals);
- Establish an eco-fund, subsidies or grants for better management of industrial hazardous waste;
- Management in industry and mining sectors should enforce systems to improve environmental conditions (implement recycling, reducing pollutants, determining the hazardous areas, etc);
- Establish an emergency centre for accidents, or environmental emergency situations that might come from industry and mining sectors;

- Environmental information within these two sectors should be managed more efficiently, and opened to the public;
- For both sectors should be developed and well defined policies for environment and sustainable development, in accordance with national environmental legislation and EU directives;

Waste sector

- The entire waste management system needs to be improved;
- Promote waste reducing, reusing and recycling;
- Improve the technical maintenance of sanitary landfills, in order to prevent mixing of surface waters with those of the landfill;
- Implement strategic plan for waste management, and implement the specified measures for landfills;

Agriculture sector

- Safe storage of agriculture waste (pesticides, fertilizers etc) in appropriate locations;
- Improved management systems of chemical products used in agriculture and increased efficiency use;
- Awareness raising of farmers, companies, and consumers for the use of hazardous substances in agriculture sector;

Transport sector

- Promoting the use of new vehicles and prohibiting the use of old vehicles,
- Use high quality fuel with less impact on, environment. Enforce implementing the regulation on fuel quality, (sulphur concentration less than 0.001%);
- Implement the regulation on limit emission values for transport sector, and other regulations related to fuel quality;
- Increase the efficiency of transport waste management (to be recycled or stored in appropriate locations);

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