

# REHABILITATION OF HOT SPOTS, CREATION OF SAFE AREAS FOR THE POPULATION OF ALBANIA THROUGH SUSTAINABLE DEVELOPMENT

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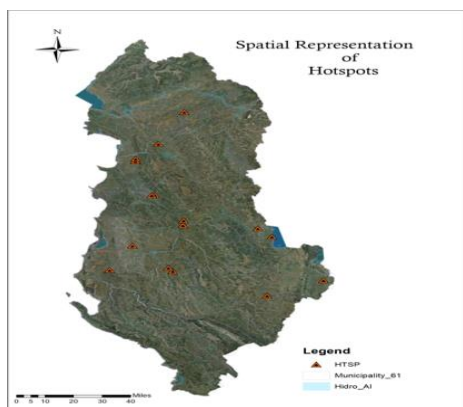
## 1. Background

Albania after the Second World War was gradually transformed from an agrarian country to an industrial-agrarian country until the end of the 90s, where the largest works of Albanian industry were built, such as: a steel plant in Elbasan capable of processing over 1 million tons iron ore, a large oil refinery, the development of the chrome, iron-nickel and copper mining and processing industry; other plants for the production and processing of chemical fertilizers, bitumen, cement, bricks, light industry and processing plants; etc. With the change of the system after the 90s, the industry in our country stopped production, creating many hot spots for the environment, where 16 priority hotspots have been identified, with a total area of about 255.5 ha

## 2. Hot spots in Albania

### 2.1. Rehova

The copper mine in the village of Rehovë, which has been out of production since 1990 covers an area of approximately one km<sup>2</sup>. The factory has worked for about 11 years, where 678,930 tons of ore were processed and produced about 47,000 tons of copper concentrate with about 17.5% Cu. The amount of waste in the landfill is estimated at 500,000 tons, while the total volume of pollution is approximately 35,000 m<sup>3</sup>.



### 2.2. Bitinca Mine

The mines of Bitincka are one of the four areas of iron and nickel deposits in the region which are 9 km from the Greek border. There are two types of ore Fe-Ni and Fe-Si. Reserves are approximately 37 million tonnes at a nickel grade of 1.63% and the mine's production rate is approximately 100-200,000 tonnes of Fe-Ni ore per year. The amount of Fe-Ni sterility stock is estimated at several hundred thousand tons, which are placed in the open air without any specific measure.

### 2.3. Waste from Processing Red-Stone

The dam at Guri Kuq is approximately 1 km<sup>2</sup> and located on the shore of Lake Ohrid, a UNESCO site. The ore content of the deposit is iron-nickel of 0.8-1.1% Ni where were produced about 2861300 tons during 1976-1992. This dam was used as an emergency dam at the Guri Kuq (Red Stone) mine, without an engineered barrier or liner. It is estimated that the surface waters and ecosystem of this transboundary lake are separated from the history and activities related to mining.

### 2.4. Alba Film Studio

Studio Alba Film is located in the northeastern part of Tirana, in a populated and built-up area near Dajti mountain. It is a state-owned enterprise since 1952 and was used as a national film studio for stage filming until 1996. Potassium ferrocyanide is used as a photographic chemical.

### 2.5. Battery Factory – Berat

The former Battery Factory - Berat is located in the Uznovë neighbourhood of Berat, which has not been operating since April 2008. The Osum River flows 1.9 km to the south of the area and the entire plot occupies an area of about 18,900 m<sup>2</sup>. On the northern side of the site is a storage area where empty battery cases were dumped in piles and air pollution (lead deposition) was also a major problem.

### 2.6. Dajti's Enterprise

Dajti Enterprise is located at the former metallurgical enterprise Tirana, where stoves and other metal items such as screws were produced. The size of the enterprise is 23,000 m<sup>2</sup>. In this area there are approximately 30 half-filled drums containing 750 kg of mixed cyanide from the previous use of the site (galvanizing process).

### 2.7. Ferrochrome Smelting – Elbasan

The former Elbasan ferrochrome smelter is located in the village of Vidhas, Elbasan, which was used for agriculture before the plant was built in 1989. The total area of the plot is 18.8 ha and the Shkumbin River is approximately 15-20 km away from the site. The metallurgical facilities in Elbasan were opened from 1977 to 1990, that once produced coke, steel, iron and some nickel.

### 2.8. Textile Factory in Berat

The textile factory is located in the northwest of the city of Berat, 2-3 km from historical area. The nearest residential area is only 500 m from the site and population in the area is about 300 people. The Osum River flows 0.9 km west of the site and limited vegetation is present on the site. The sources of pollution found in the country are as follows: ammonia, large amount of chemicals, stored batteries of unknown content.

### 2.9. Përrenjas Mine

The Përrenjasi mine is located in the district of Librazhd, and the size of the entire mining area is about 1 km<sup>2</sup>. The residential area is located south of the former mine dump. The site is a former iron-nickel

## 4. Conclusions and Acknowledgements

This article was prepared from the materials prepared within the United Nations Development Program (UNDP) Project "Environmental Identification and Prioritization 00059071, Albania, 2011. Since a relatively long time has passed, more than 10 years, and their rehabilitation has not been carried out, it is necessary to reassess the situation based on more detailed analyses of the pollution of the deeper layers of soil and underground water.

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open pit mine that was in operation from 1966-1989. Several thousand tons of sterility reserves are left in place in the open air without any specific measure and surface water can flow through it.

### 2.10 Site of waste from the extract – Fushe Arrez

The Fushë-Arrëz storage site is located in the region of Shkodra and the tailings dams are located near the Fan i Madh river. The surface of the plant is 29 ha and very rich copper fractions are still present in this area (about 4% Cu, 2% Zn, 4g/t Au and up to 40g/t Ag).

### 2.11 Laç Phosphate Factory

The phosphate factory was in operation during the years 1966-1999 and 2002-2003, where in the last year it was managed by the French company "EVER TRADE COMPANY". Sources of contamination in the country are associated with various stages of the superphosphate production process. The sulfuric acid production capacity was 40,000 tons/year and the amount of hazardous waste present at the site was more than 300,000 tons of dusty waste that can be easily dispersed through the air or washed away by rainwater.

### 2.12 Copper smelting in Laç

The industrial complex of Laçi also has the copper smelting factory, only 12 ha on the outskirts of the northern part of the city of Laçi. The Laç copper plant was used to process copper concentrates from the Fushë Arrezi Complex and the copper smelting process was used to produce high amounts of SO<sub>2</sub> which was initially emitted directly into the atmosphere through a very tall chimney. In order to mitigate the consequences of these discharges, at the beginning of 1991, the sulfuric acid production unit was built, with a dual purpose: reducing the releases of SO<sub>2</sub> and producing sulfuric acid.

### 2.13 Pesticide storage in Lushnja

In the southwestern part of the city of Lushnja, there are two buildings with an area of 2000 m<sup>2</sup> owned by the Ministry of Agriculture. The main activity carried out in the buildings before the 1990s was the storage of agricultural tools from pesticides to agricultural machinery for nearly 75 years. After the 90s, the sites were abandoned and occupied by families for shelter. The main sewage channel is located near the construction site, connected to the river Shkumbin.

### 2.14 Balez Chemical Warehouse in Elbasan

The chemical warehouse is located in a small village called Balez, 5 km north of the city of Elbasan. The area is under the supervision of the Ministry of Infrastructure and Energy (MIE) and serves as a storage facility for chemicals from the former industrial and energy industries. Warehousing started in the nineties when most industries closed down. On the eastern side of the area there is a small stream (distance < 100 meters) that connects to the Shkumbin river.

### 2.15 Nitrogen fertilizers in Fier

The site is a former agricultural ammonium nitrate fertilizer factory built in the 1960s and included six lines for the production of nutrient fertilizers, including urea and ammonium nitrate. The fertilizer plant was productive between 1967 and 1992 and is located near the city of Fier and the river Gjanica, with an area of about 30 ha.

### 2.16 Pesticide storage site in Rrëshen

The pesticide storage site in Rrëshen is located in the north-east of the village of Rrëshen, about 1 km from the centre of the village, with an area of about 0.2 ha. The site was previously used as a warehouse park. Approximately 100 m on the northern side of the construction site, there is the main canal that supplies the town of Rreshen with drinking water.

## 3. Rehabilitation of the area

### 3.1 Methodology

The improvement of these areas occurs as an independent approach, or a combination of these three elements such as:

- Destruction or alteration of pollutants by changing the chemical structure
- Extraction or separation of pollutants from pollution area by treatment technologies
- Immobilization of pollutants (stabilization, solidification)

### 3.1 Cost of Rehabilitation

The table below shows the area for each hotspot and the cost of rehabilitation depending on the type of pollutant and the contaminated area.

NO	Name of the Hotspots Area	Surface Area (ha)	Treatment Cost Euro
1	Miniera e Bitinckës në Korçë	2-2.5	5.460.000,00
2	Guri i Kuq, Pogradec;	3	2.270.000,00
3	Alba Film, Tiranë	2	585.000,00
4	Ndërmarrja e Baterive në Berat	2	2.015.000,00
5	Ish ndërmarrja Dajti, Tiranë	2.3	45.500,00
6	Uzina Metalurgjike në Elbasan	11	38.350.000,00
7	Ndërmarrja Tekstile, Berat	0.6	195.000,00
8	Miniera e Fe-Ni, në Përrenjas	23	13.000.000,00
9	Magazina në Rrëshen	0.2	455.000,00
10	Vendepozitimi i mbetjeve- Fushe Arrez	20-30	11.700.000
11	Uzina e fosfateve – Lac	38	no calculated
12	Fabrika e Bakrit– Laç	12	no calculated
13	Magazina Bujqesore– Lushnje	0.2	812.500,00
14	Miniera ne Rehove	100	13.000.000,00
15	Depo Kimike Balez ne Elbasan	1	no calculated
16	Depozita të amortizuara në ish-fabrikën e plehrave azotike në Fier	30	no calculated

Table no.1 surface area and treatment cost of hotspots