PROJECT FINAL REPORT

Title:

STUDY ON SMALL-SCALE MINING IN ALBANIA:

Improving Transparency, Economic and Financial Issues, and Health and Safety Impacts

FOR ERZEN RIVER

Targets of Project: Identifying intricate impacts of gravel caves; nature, extent and norms of effects caused by Erzen riverbed exploitation.

Term of delivery: Prepared between July 2009 and November 2009

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CONTENTS

Orientations

A recreation compound on Erzen River banks
I - INTRODUCTION

II - METHODOLOGY AND IMPLEMENTATION OF THE MONITORING PROGRAMME

III – ERZEN RIVER
1. Geological features
2. Current state of the Erzen riverbed
3. Aggregate exploitation facilities on the Erzen riverbed
4. Data on Erzen riverbed gravel exploitation activity before being prohibited
5. Outcome of on-site check on the Erzen riverbed
6. Small-scale exploitation activity
7. Analysis of the situation surrounding exploitation activity
8. A road map for the evaluation and control of, and tax on, the Erzen riverbed gravel exploitation activity
9. Conclusions

Section of upstream Erzen
Orientations:

- We will come up with an assessment of the size and number of the small-scale mining workings in the industrial mineral sector, and particularly, sand/gravel exploited in Erzen riverbed, as well as the possibility for this sector to generate revenues. Field studies will be focussed on sand/gravel exploitation activities in Erzen.

- We will approach the very individuals and companies formerly involved in the study of these issues.

- We will suggest overall solutions to how the Government can effectively check on the workings, and collect revenues.

Outcomes:

- 1. A summary of the number and type of small-scale industrial mineral production workings, including the environmental impact,

- 2. A road map for the respective Ministries (that is, the Ministry of Economy, Trade and Energy, the Ministry of Finances) to consider possible revenues generated by these small-scale mining workings, as well as a suggestion how the Government can collect these revenues. This report contains clear regulatory recommendations, which would help the Government better check on the activities in this sector.
Erzen River water catchment area
I. INTRODUCTION

Under the Contract concluded between MATCOM and ALINA Sh.p.k. & I.T.N.P.M. between July 2009 and November 2009, the necessary work for identifying and monitoring Erzen riverbed-related problems, including gravels exploitation and processing, the investments made, the economic effects for the community, and environmental issues.

For the targets to be met, the following tasks were executed:

The first task: Exploring the riverbed chosen for the purpose of considering and identifying the structure of workings to be carried out, the approaches to be adopted, and the other characteristic features to be assessed. Hence, the riverbed between both banks was inspected, the geo-morphological characteristics of the gravel deposits were considered, the places of the riverbed and banks where exploitation took place, were located, and the constructed plants were identified, with a view to collecting further information in compliance with the specific conditions surrounding the issue under discussion.

Second task: Inspecting the processing plants and gravel caves, at which stage direct information on important quantitative and economic aspects of the gravel exploitation activity in the Erzen River was gathered.

Inspection of the longitudinal profile of the river banks and riverbed, and the plants constructed over the time along given segments, was complimentary to the second task. To this end, pictures were taken, and meetings were held with employees found accidentally on site, who, overall, refused to introduce themselves.

Third task: Determining the economic parameters of the gravel manufacturing and processing facilities, where an approximate assessment of the volumes of the gravel produced, settlement of sediments and their exploitation by subjective factors, as well as the erosion resulting from environmental damage, was made.

Fourth task: Verifying on-site collected data in the course of meetings with the responsible institutions, and with the majority of individuals administering private subjects exploiting the Erzen River gravel. Ongoing comparison of data and volumes, as well as output differences was designed to obtain maximum accuracy of these data.

Fifth task: Analysing the accumulated data and facts on quantities and volumes of displaced gravels, and other economic aspects of such process relating to Erzen, so as to facilitate reaching of preliminary conclusions. These conclusions were compared to previous similar studies on Erzen and other rivers across the country, and other experiences.

In an effort to develop a long-term rehabilitation programme, this was undertaken with a view to ensuring a most effective intervention through the legal regulation of the gravel
exploitation activity in the Erzen River, making sure that the investments made along its valley are not impaired, and no further environmental damage is brought about.

II. METHODOLOGY AND IMPLEMENTATION OF THE MONITORING PROGRAMME

For all the tasks, the same methodology was applied for the implementation of the project: on-site identification, possible contacts with the private subjects’ personnel, possible contacts with the personnel of the state-run institutions, utilisation of other similar studies, identification of problems and reviewing of their accuracy, conclusions and people’s introduction to them so as to enhance their accuracy and render these conclusions acceptable by them. In a number of cases, volumes found on exploitation sites were measured and assessed.

We would like to point out that, during the current study period, there were days without rainfall, and the quantity of possibly to be-exploited gravel had already been exploited during spring and had been accumulated at plants. Overall, gravel had been taken illegally, however difficult to detect given the short time available to us.

III. ERZEN RIVER

A special body, the National Water Council, tasked with the administration of waters in the Republic of Albania, has been established. The National Water Council reports to the Prime Minister of Albania. The National Water Council is duty bound to introduce laws and subordinate laws regulating the complex exploitation activity concerning the country’s water deposits, and the supervision of this activity. The National Water Secretariat is the executive body of the National Water Council. At a Region level, the Water Catchment Area Councils and the subordinate Water Departments have been set up. The Water Department for the Erzen River is chaired by Mr. Fatmir Nuhja.

Aside from the law on waters and the subordinate acts pursuant to it, issues surrounding river gravel exploitation has been a matter of concern, and such activity has been subject to a number of acts that the National Water Council promulgated between 2006 and 2009, including the following:

- Decision by the National Water Council no. 1, dated 21 June 2006, “On reducing the exploitation of sand and gravels...”
- Decision by the National Water Council no. 2, dated 7 June 2007, “On procedures for granting and renewing permits...”
The Erzen River aggregate exploitation is prohibited by Decision of the National Water Council no.1, dated 21 June 2006, “On reducing exploitation of sand and gravels...”

This means that sand and gravel exploitation in Erzen riverbed is prohibited by law. However, the Erzen River valley features 14 building materials processing plants producing concrete blocks and prefabricated stuffs. And these subjects would seize the opportunity to illegally take sand and gravel away from the Erzen riverbed, which they would process in their plants. They claim that they are buying or producing raw materials for own plants. Hence, the companies hold a license for their industrial (processing) activity. However, they do not have permission to take their raw materials (read: gravel exploitation) away from the Erzen riverbed.

1. **Geological features**

The Erzen River is 109 km long, from its spring east of the Kruja-Dajt (Shënmëri-Shëngjergj area) mountain range to its mouth on the Adriatic Sea (north of Bishti i Pallës), with an enlarged catchment area on the flysch in the cretaceous zone, carrying on
through limestone in the upper cretaceous zone where it has formed tourist canyons in its surroundings. In contact with the carbonate formations, a mergeline-carbonate package nearly 150 m thick towards south-east is interrupted in the downstream area. Further downstream, in the direction of Pëllumbas, the tortonian mollasic formations are interrupted, with this going on until close to Mullet, where flysch deposits, and further to the west, a sand package, appear. The sand, of which particles range from fine to median size, helps build both banks of the Erzen River.

The Erzen River, and its tributaries Zalli, Zhullima and Peza, form a water catchment area of 760 km². Its source is located in the vicinity of Gurakuq Pass, at a quota of 1300 m.

On this riverbed, the Erzen flow takes away and transports sludge and gravel fractions, and deposits them in its numerous meanders. Upstream, it features from coarse-textured deposits to boulders sized 0.3-0.4 m. In the midstream area, it generally catches sand and medium size gravel. Downstream, fine sand and sludge is deposited. Sludge continues to appear until its emptying into the sea.

The most powerful erosion activity in the river environs is registered around upstream source, and particularly, at the confluence of the Erzen River and the Zall River, and less activity is noticed in the vicinity of Ura e Peshkatarit (Fisherman's Bridge). At this segment, strong formations are overall processed into useful gravels for constructions.
Section of upstream Erzen

The segment from Ura e Peshkatarit, to the west, as far as the village of Romanat, is dominated by clays and clay-alevroits, which, past processing stage, are carried over long distances, and settle in the numerous meanders, or in the sea. The material with a low percentage of sand, which is eroded in this area, joins that coming from the upstream area, and generally, settles along the riverbed in suitable meanders, and in compliance with the conditions of the hydric dynamics of the Erzen River.

Overall, vegetation across the Erzen River valley is scarce, and takes up 37 per cent of the surface area.

Over the segment from Shkëmbi i Pëllumbasit, as a reference point, to Ndroq, an active Erzen runs at rapid pace, at a high flow, due to the difference in its quotas dropping from 450 m to 37 m. This also determines the high erosion, processional and transportation activity of this river. The Romanat-Ndroq-Pezë Helmës-Ura e Beshirit-Arbana-Mullet segment, and further to the east, absorbs gravel fractions sized from 0.15 mm to 5-10-15 mm.

New Ura e Peshkatarit (Fisherman’s Bridge) constructed following destruction of old bridge
The studies have found the following content of the gravel fractions shown in percentage:

<table>
<thead>
<tr>
<th>Fraction, in mm</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-5</td>
<td>8.36</td>
</tr>
<tr>
<td>1-2</td>
<td>20.08</td>
</tr>
<tr>
<td>0.6</td>
<td>21.34</td>
</tr>
<tr>
<td>0.3</td>
<td>17.01</td>
</tr>
<tr>
<td>0.15</td>
<td>12.32</td>
</tr>
<tr>
<td>&lt;0.15</td>
<td>20.82</td>
</tr>
</tbody>
</table>

This table shows that over one third of the eroded material is fine material, which is problematic for the river in the downstream area, and for the relationships of the river with the sea.

Analyses have revealed the following chemical content of the material carried by the Erzen River:

<table>
<thead>
<tr>
<th>Content</th>
<th>Quantity, in percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>SiO₂</td>
<td>50.08</td>
</tr>
<tr>
<td>Al₂O₃</td>
<td>5.74</td>
</tr>
<tr>
<td>Fe₂O₃</td>
<td>3.69</td>
</tr>
<tr>
<td>CaO</td>
<td>19.24</td>
</tr>
<tr>
<td>TiO₂</td>
<td>0.26</td>
</tr>
<tr>
<td>MgO</td>
<td>2.02</td>
</tr>
<tr>
<td>Na₂O</td>
<td>0.17</td>
</tr>
<tr>
<td>K₂O</td>
<td>1.00</td>
</tr>
<tr>
<td>Others</td>
<td>17.8</td>
</tr>
</tbody>
</table>

Silicon oxide and calcium oxide are the prevailing chemical components of the material, with this composition changing over the river course due to the granulometric fraction of the rock-forming minerals.

2. **Current condition of the Erzen riverbed**

After cutting through the Kruja-Dajt limestone mountain range, the Erzen River runs through a narrow terrigenous valley as far as north of Krraba, to the vicinity of Mullet and Farka, and flows onto a valley growing gradually wider. A considerable quantity of aggregates settles on its bottom, on a yearly basis. The terrain on both river banks is overall solid, and the riverbed is hard to process in the presence of limestone, sand and clay shales.
The terrain around both banks is overwhelmingly solid, with landslides being frequently predominant at a number of segments featuring clays and greater steep in barren areas. The erosion activity is intensive when rainfall increases and vegetation strips off the area, and in the meanders and watercourse bends or tributaries fed by brooks running either side of the river. Arable lands situated at the same quota as the riverbed are at greater risk. The study has identified a considerable stretch lying from Pëllumbas to Iba, where the riverbed changes southwards, also, due to the steep terrain. Similar areas are also noticed at Bërzhita, Dobresh, Farka, Pezë Helmës, Ndroq, and Romanat.

After 1990, with the liberalisation of the Albanian economy and in face of the urge to meet the rapidly growing needs of the construction sector, private subjects legally and illegally set about exploiting gravel quarries at the Erzen riverbed segment from Iba, inclusive, to Hardhisht, near Shijak, and established gravel processing plants. Intensive exploitation, unsupported by projects and environmental rehabilitation measures, and subject to no checks concerning the criteria for and extent of such exploitation, has led to a dramatic situation for the ecology of this river. This forced the Government of Albania to take a decision to categorically stop gravel exploitation in this river. This decision was partly enforced, as no measures were foreseen to replace this indispensable material on the market, no measures were put in place to transfer the investments made, and the necessary instruments allowing control of the situation and recovery were not developed.
Illegal exploitation activity in Erzen riverbed

On the basis of the survey conducted and the examination of such experience on a constant basis, it is noted that the exploitation activity, without observing the aforementioned criteria, has caused damage that is beyond repair, or that needs considerable additional expenses to repair, including:

- Riverbed diversion at given segments;
- Increase in the speed of water flow and its slowing, contrary to the very nature of the river.
- Increase in the erosion capacity of the river, and its adverse energy.
- Destruction of infrastructure facilities, including bridges, embankments, irrigation facilities, water supply facilities, canals, industrial facilities, and agricultural facilities.
- Increased risks for built-up areas.

Finally, we note that the environmental balance in the river has been upset, with its leading and continuing to lead to further damage. Damage has been caused to the irrigation water collecting facility at Pëllumbas, the arable lands at Bërzhita and Dobresh, Ura e Peshkatarit and the Baldushk bridge, and water pumping stations at Picalla and Bultica.
Intensive exploitation of gravel material has been registered in an area of around 30 km, encompassing 22 gravel exploitation plants shown in the map attached.

Such exploitation activity in this entire area has practically led to exhaustion of the aggregates that have settled there in years and centuries, and exposure of the rock floor of the riverbed. Root rocks are quite evident at Dobresh, Mullet, Shkallea plains, Sena, Sharra oak forest, Fīva plain, Beshir bridge, and the new neighbourhood, Ndroq.

3. Aggregate exploitation facilities on the Erzen riverbed

Increased needs for construction materials at segments of the infrastructure to be rehabilitated, and the industrial and social constructions in the very Erzen catchment area and near it, with Tirana being located in the vicinity of this catchment area, determined the opening of numerous gravel quarries in this river and led to an intensive exploitation activity in these quarries. After 2000, 22 private subjects were established and started gravel exploitation activities in the Erzen riverbed. The exploitation facilities are shown in order in the relevant map, by location.
Between 2000 and 2009, calculations of aggregates exploited by subjects are shown in the following table (2). Table (1) shows the current storage of gravel material on the sites administered by a number of subjects, which are currently carrying out such activity in this area.

It was not possible to come up with real figures for the amounts of gravel material exploited by subjects, because the amount they are reporting is of course much below what the riverbed has to offer, and much below the market needs, and much below the figures given at different times for the gravel reserves. Measurements carried out indicate the following current gravel quantities:

- Upstream as far down as Fikas-Kryezi.....3.5 million m³
- Krasina Bridge................................. 500 m³
- Beshir Bridge.....................................0.5 million m³
- Romanat, Lagja e Re..........................0.5 million m³
- Hardhishta........................................0.1 million m³

Calculation of the appropriate differences between the reported exploitation activity and the unreported exploitation activity, adding up the reserves, indicates that the reported production of aggregates is at least 40 per cent less than that reported between 2000 and 2008.

Gravel material taken from the Erzen River is estimated to account for around 15 per cent of the domestic grave production, meaning that around 6 million m³ of gravel material are estimated to have been exploited in its riverbed.

**Percentage of aggregates in the Erzen River:**
4. Data on Erzen riverbed gravel exploitation activity before being prohibited

Inspections and checks conducted over the years, and the studies on the exploitation activity and its effects for the Erzen River, produce different data on the level of the gravel exploitation activity. Nonetheless, it is clear that exploitation activity has been quite intensive due to the fact that Tirana big market was close to this riverbed, and to the constructions boom during that period.

Evidence collected to produce the data shown in Table 1 refers to the quantity of gravel material found on the above-mentioned sites towards the end of May 2006. Table 2 shows gravel production by subject at that period of gravel exploitation activity in the Erzen River.
### Quantities of gravel material found on sites of plants

#### Table 1

<table>
<thead>
<tr>
<th>No.</th>
<th>Name of subject</th>
<th>Reserves in m³</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Lura</td>
<td>26,000</td>
</tr>
<tr>
<td>2</td>
<td>Kirchberger</td>
<td>12,000</td>
</tr>
<tr>
<td>3</td>
<td>Fusha</td>
<td>600</td>
</tr>
<tr>
<td>4</td>
<td>Ital-beton</td>
<td>8400</td>
</tr>
<tr>
<td>5</td>
<td>Alb-beton</td>
<td>11,800</td>
</tr>
<tr>
<td>6</td>
<td>Euro-vini</td>
<td>71,000</td>
</tr>
<tr>
<td>7</td>
<td>Beton-Fark</td>
<td>6,800</td>
</tr>
<tr>
<td>8</td>
<td>AGE</td>
<td>1,200</td>
</tr>
<tr>
<td>9</td>
<td>Dajlani</td>
<td>7,400</td>
</tr>
<tr>
<td>10</td>
<td>Kepi i Dragojve</td>
<td>15,600</td>
</tr>
<tr>
<td>11</td>
<td>Sina 98</td>
<td>200</td>
</tr>
<tr>
<td>12</td>
<td>Kaltërsia</td>
<td>200</td>
</tr>
<tr>
<td>13</td>
<td>Meniku</td>
<td>5,800</td>
</tr>
<tr>
<td>14</td>
<td>Alb-Tir</td>
<td>260</td>
</tr>
<tr>
<td>15</td>
<td>Tirana DKK</td>
<td>780</td>
</tr>
<tr>
<td>16</td>
<td>Taner</td>
<td>200</td>
</tr>
<tr>
<td>17</td>
<td>Mak Albania</td>
<td>28,000</td>
</tr>
<tr>
<td>18</td>
<td>GIP</td>
<td>4,160</td>
</tr>
<tr>
<td>19</td>
<td>Ital-beton</td>
<td>21,000</td>
</tr>
<tr>
<td>20</td>
<td>Zeneli</td>
<td>5,600</td>
</tr>
<tr>
<td>21</td>
<td>Vasili</td>
<td>5,300</td>
</tr>
<tr>
<td>22</td>
<td>Kokomani</td>
<td>3,900</td>
</tr>
</tbody>
</table>

### Monthly gravel production by subject

#### Table 2
In direct communication, the companies stated that they are not carrying out any exploitation activity in the Erzen riverbed. During on-site checking, machineries were found loading river gravel, and the gravel processing plants were using the gravel material taken away from the Erzen riverbed. When asked, the persons, including drivers and workers, refused to give their names, or those of the companies and the company owners. In the course of its inspections, the relevant office of the National Water Secretariat has also identified the phenomenon of the illegal gravel exploitation activity in the Erzen riverbed, and has accordingly levied fines for the violations committed. Yet, no stop has been put to this phenomenon.

The data on the gravel stocks on the plant sites, by subjects, reflect the actual assessment of sites, being held responsible for the accuracy of this assessment on the day of survey of the river terrain where subjects are located.

The data on the yearly quantities illegally taken away by each subject are inferred indirectly, upon examination of the situation surrounding each subject’ plant, the

<table>
<thead>
<tr>
<th>No.</th>
<th>Name of subject</th>
<th>Production over 5 years, m³</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Lura</td>
<td>30,000</td>
</tr>
<tr>
<td>2</td>
<td>Kirchberger</td>
<td>66,000</td>
</tr>
<tr>
<td>3</td>
<td>Fusha</td>
<td>72,000</td>
</tr>
<tr>
<td>4</td>
<td>Ital-beton</td>
<td>60,000</td>
</tr>
<tr>
<td>5</td>
<td>Alb-beton</td>
<td>78,000</td>
</tr>
<tr>
<td>6</td>
<td>Euro-vini</td>
<td>240,000</td>
</tr>
<tr>
<td>7</td>
<td>Beton-Fark</td>
<td>120,000</td>
</tr>
<tr>
<td>8</td>
<td>AGE</td>
<td>30,000</td>
</tr>
<tr>
<td>9</td>
<td>Dajlani</td>
<td>180,000</td>
</tr>
<tr>
<td>10</td>
<td>Kepi i Dragojve</td>
<td>180,000</td>
</tr>
<tr>
<td>11</td>
<td>Sina 98</td>
<td>150,000</td>
</tr>
<tr>
<td>12</td>
<td>Kaltërsia</td>
<td>60,000</td>
</tr>
<tr>
<td>13</td>
<td>Meniku</td>
<td>72,000</td>
</tr>
<tr>
<td>14</td>
<td>Alb-Tir</td>
<td>54,000</td>
</tr>
<tr>
<td>15</td>
<td>Tirana DKK</td>
<td>24,000</td>
</tr>
<tr>
<td>16</td>
<td>Taner</td>
<td>48,000</td>
</tr>
<tr>
<td>17</td>
<td>Mak Albania</td>
<td>60,000</td>
</tr>
<tr>
<td>18</td>
<td>GIP</td>
<td>114,000</td>
</tr>
<tr>
<td>19</td>
<td>Ital-beton</td>
<td>180,000</td>
</tr>
<tr>
<td>20</td>
<td>Zeneli</td>
<td>30,000</td>
</tr>
<tr>
<td>21</td>
<td>Vasili</td>
<td>30,000</td>
</tr>
<tr>
<td>22</td>
<td>Kokomani</td>
<td>30,000</td>
</tr>
</tbody>
</table>
possibilities for accumulating gravel material in the relevant river sections during autumn and spring floods, and the gravel stocks found in the riverbed at the moment of the on-site inspection, with this inspection being indispensable for writing this report. During inspection, secondary environmental impacts by this exploitation activity on site were also considered.

5. **Outcome of on-site check on the Erzen riverbed**

First by mid-August 2009, and then, early September 2009, on-site survey of subjects possibly involved in gravel exploitation and processing activities in the Erzen riverbed was conducted.

In identifying the gravel caves in the Erzen riverbed, we relied on the on-site surveys and the information obtained from the documents we received from the private companies involved in gravel cave workings.

During our on-site survey, joined by the experts coming forward from the subjects involved in activities in the Erzen riverbed and the local inhabitants, we inserted all the gravel caves being exploited during the survey period into a map of a scale 1:10,000.
Gravel transportation by truck along Erzen riverbed

Monitoring of activities in the gravel riverbed revealed that a number of gravel caves are being exploited illegally (without licence), without any exploitation project in place. Pictures taken show people digging for and taking gravel material from the riverbed, or the banks (plains).

Inspection indicated that a number of subjects were running important processing plants, as outlined in the following:

1. River Erzen, Kirchberger, administrator Mr. Refik Korbeci:
   • Does not hold a gravel exploitation permit, and declares that they are not producing gravel material;
   • 6-7 workers on site;
   • Produces concrete asphalt;
   • Gravel material is sold at 700-800 lekë/m³ in the form of sand and grit;
   • Has capability to produce gravel material;
   • Capacity is 100 thousand m³ per year.

   • Ital Alb Erzen Does not hold an exploitation permit, and declares that they are not working.
2. Farka Bridge, *Alb-beton*, administrator Tan Dule:
   - Does not hold a gravel exploitation permit, and declares that they are not producing gravel material;
   - 4-5 workers on site;
   - Produces gravel by-products and concrete;
   - Gravel is sold at 700-800 lekë/m³ in the form of sand and grit;
   - Has capability to produce gravel material;
   - Capacity is 100 thousand m³ per year.

3. *Eurovin*, administrator Bujar Hasa:
   - Does not hold a gravel exploitation permit, and declares that they are not producing gravel material;
   - 8-9 workers on site;
   - Produces gravel by-products and concrete;
   - Gravel material is sold at 700-800 lekë/m³ in the form of sand and grit;
   - Has capability to produce gravel material;
   - Capacity is 100 thousand m³ per year.

4. *Cara Sh.p.k.*
5. *BSMurati Sh.p.k.*, administrator Mr. Skander Murati:

6. *Alban Tirana Co.*, legal director Gëzim Kallaveri:
   - Does not hold a gravel exploitation permit, and declares that they are not producing gravel material;
   - 8-9 workers on site;
   - Produces gravel by-products and concrete;
   - Gravel material is sold at 700-800 lekë/m³ in the form of sand and grit;
   - Has capability to produce gravel material;
   - Capacity is 100 thousand m³/per year.

7. *Mani 07 Sh.p.k."
   - Does not hold a gravel exploitation permit, and declares that they are not producing gravel material and they are buying it from third parties. Actually, we found out that they are exploiting gravel material in the riverbed; there were a lot of means there and on the river terraces representing arable land bought by third parties; no exploitation permit has been issued by an authorised body and they do not pay a surface tax.
   - 9-10 workers on site;
• Produces gravel by-products and concrete;
• Gravel material is sold at 700-800 lekë/m³ in the form of sand and grit;
• Has capability to produce gravel material;
• Capacity is 100 thousand m³/per year.

8. **Italba-asfalt**, under Italian ownership:
   • Does not hold a gravel exploitation permit, and declares that they are not producing gravel material. The material is bought from the *Luti Sh.p.k.* Company, which had its means on the river terraces and on the riverbed, but refrained from being identified.
   • 6-7 workers on site;
   • Produces concrete asphalt and concrete prefabricated elements;
   • Holds an exploitation permit for a limestone quarry at Dorëz-Peza.
   • Has capability to produce gravel material;
   • Capacity is 100 thousand m³/per year.

9. **D&A**, administrator Dritan Kokomiri:
   • Does not hold a gravel exploitation permit, and declares that they are not producing gravel material;
• 6-7 workers on site;
• Produces gravel by-products and concrete;
• Gravel material is bought at 500-1,000 lekë/m³ in the form of sand and grit;
• Has capability to produce gravel material;
• Capacity is 100 thousand m³/per year.

Exploitation area on Erzen River banks

Officially, all the subjects would deny illegally exploiting gravel material in the Erzen riverbed, and would claim that they buy it over from license holders taking it away from other rivers (Mat, Shkumbin), and they would exploit terrains admitting old river deposits close to the shoreline, by purchasing land from farmers possessing it. In confidential conversation, a number of the company owners would admit the illegal exploitation activity during spring and autumn when the river moves gravels settling in the vicinity of their plants.

6. Small-scale exploitation activity

As well as spotting important investments intended, in one way or another, for exploitation of the Erzen catchment area for the purpose of meeting their needs for gravel material, we also found that many small-scale subjects and physical persons were
sporadically taking sand, grit and stones from the riverbed so as to meet their needs to construct dwelling-houses in the rural area, and pave roads. Considering the numerous buildings that have gone up across the valley, and the evident improvement in the road infrastructure in the local neighbourhoods and that among isolated houses, we believe that a considerable quantity of gravel material is being taken away without paying any obligation to the State. We share the opinion that for taking away this quantity, estimated at 100 thousand m³, they look forward for the days of good weather over the year, where construction teams work.

7. Analysis of the situation surrounding exploitation activity

Analysis 1

The quantities exploited, which are calculated based on a number of parameters collected on site in the course of the inspection, are shown in Table 4.

Table 3 shows the quantities of gravel material found on the sites of the processing plants run by the subjects examined.
Analysis 2

The economics behind gravel exploitation activity (as an average of the subjects currently involved in activities) in the Erzen riverbed is as follows:

• Annual capacity estimated from several thousands to 100 thousand m³
• Recovery of material ....................... (60-75%)
• By-products ......................... grit, sand
• Average investment in simple processing.....25 million lekë
• Extraction cost for 1 m³.....................180-280 lekë
• Processing cost for 1 m³.............. 280-390 lekë
• Revenue for m³.......................... 450-580 lekë
• Repayment of investment.......................1.5-2 years

Analysis 3

Categories of damage and causes:

• Direct impact on the physical parameters of the river flow:
  ③ Geometry of canal
  ③ Height above riverbed
Composition of substratum and its solidity
Elements of the severity of flow
Deepness, speed, turbidity, transportation of sediments, water flow, temperature.

- Hydraulics of canal, transportation of sediments and morphology
- Erosion of riverbanks
- Reconfiguration of borders both due to the removal of materials and the accumulation of materials
Quantities of gravel material found on sites of plants

Tab.3

<table>
<thead>
<tr>
<th>No.</th>
<th>Name of subject</th>
<th>Reserves in m³</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kirchberger</td>
<td>8,000</td>
</tr>
<tr>
<td>2</td>
<td>Fusha</td>
<td>300</td>
</tr>
<tr>
<td>3</td>
<td>Ital-beton</td>
<td>5,000</td>
</tr>
<tr>
<td>4</td>
<td>Euro-vini</td>
<td>12,000</td>
</tr>
<tr>
<td>5</td>
<td>Beton-Fark</td>
<td>2,000</td>
</tr>
<tr>
<td>6</td>
<td>AGE</td>
<td>800</td>
</tr>
<tr>
<td>7</td>
<td>Dajlani</td>
<td>3,000</td>
</tr>
<tr>
<td>8</td>
<td>Kepi i Dragojve</td>
<td>5,000</td>
</tr>
<tr>
<td>9</td>
<td>Alb-Tir</td>
<td>100</td>
</tr>
<tr>
<td>10</td>
<td>Tirana DKK</td>
<td>400</td>
</tr>
<tr>
<td>11</td>
<td>Ital-beton</td>
<td>15,000</td>
</tr>
<tr>
<td>12</td>
<td>Zeneli</td>
<td>4,000</td>
</tr>
<tr>
<td>13</td>
<td>Vasili</td>
<td>3,000</td>
</tr>
<tr>
<td>14</td>
<td>Kokomani</td>
<td>4,000</td>
</tr>
</tbody>
</table>

Yearly gravel production by subject

Tab.4

<table>
<thead>
<tr>
<th>No.</th>
<th>Name of subject</th>
<th>Annual output, m³</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kirchberger</td>
<td>15,000</td>
</tr>
<tr>
<td>2</td>
<td>Fusha</td>
<td>20,000</td>
</tr>
<tr>
<td>3</td>
<td>Ital-beton</td>
<td>15,000</td>
</tr>
<tr>
<td>4</td>
<td>Euro-vini</td>
<td>40,000</td>
</tr>
<tr>
<td>5</td>
<td>Beton-Fark</td>
<td>30,000</td>
</tr>
<tr>
<td>6</td>
<td>AGE</td>
<td>6,000</td>
</tr>
<tr>
<td>7</td>
<td>Dajlani</td>
<td>40,000</td>
</tr>
<tr>
<td>8</td>
<td>Kepi i Dragojve</td>
<td>30,000</td>
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<tr>
<td>9</td>
<td>Alb-Tir</td>
<td>5,000</td>
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<tr>
<td>10</td>
<td>Tirana DKK</td>
<td>4,000</td>
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<tr>
<td>11</td>
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<td>5,000</td>
</tr>
<tr>
<td>14</td>
<td>Kokomani</td>
<td>6,000</td>
</tr>
</tbody>
</table>
• Change in the hydraulics of the water flow
• Change in the parameters of the flow and the transportation of sediments

Analysis 4

Overall, sediment areas are more widespread than the erosion areas. Characteristically, erosion areas are rather noted at the horizontal level than at the vertical level. This is typical of a number of geo-morphological and hydrological aspects of the Erzen River. It is worth-noting that gravel cave exploitation activity condition yet largely impacts on this phenomenon.

Private companies intend to take gravel material from the riverbed. In this way, however, they rather attack the riverbed width-wise than depth-wise. Modification of hydraulic parameters of the water flow has led to riverbank erosion width-wise.

On-site inspection of this area, which is an erosion zone width-wise, revealed many segments close to infrastructure works, tilled lands, and built-in areas.

Environmental damage
  Direct
• Increased erosion in the riverbed and riverbanks, damage to arable lands, and to urban and hydro-technical works.
• Turbid water, with its quality being overall affected.
• Relationships between the river mouth and sea are rived.
• Reduction in the level of subterranean waters, and worsening of the irrigation system.

Indirect
• Increase in floods.
• Change in the water regime.
  • Worsened quality parameters of the water taken from the riverbed.

Overall, it is noted that the sedimentation phenomenon is rather evident around the upstream and downstream parts of the water catchment area, and it is due to the erosion phenomenon around the upstream area of the Erzen River, and around the downstream area due to settling, to which exploitation of light fractions of sand and clay is added.

During autumn and winter, where the heaviest rainfall register, the eroded masses in the upstream water catchment area would move and settle intact in river parts allowing settlement. During this period, generally speaking, it is not possible to take gravel
material from the riverbed due to high water levels. This is an aspect of erosion in the water catchment area of the Erzen River, which, during the season of heavy rainfall, does not seem to have impacted on environmental stabilisation over the years where exploitation was prohibited, even though it turns out that considerable quantities of gravel material have been removed. Hence, inspection’s finding that the Erzen riverbed is illegally and uncontrollably exploited, stands for a fact.

Analysis 5

Institutions’ current checks on the production-processing and selling-reporting activities regarding gravel material taken from the Erzen riverbed:

- Extraction of gravel material from the riverbed has been impossible to control and is not being controlled.
- Gravel processing in plants is partly possible to control.
- Selling of grit and sand produced by plants is possible to control, and is partly controlled.

8. A road map for the evaluation and control of, and tax on, the Erzen riverbed gravel exploitation activity

Under the current situation, where, generally speaking, gravel material is illegally being exploited not only by the occasional subjects doing business on a retail basis so as to meet individual needs for river sand and ballast, but also by the large-scale operations processing it in modern plants and selling it in the form of concrete and concrete by-products, it is quite difficult, not to say impossible, to regulate the collection of revenues due to the State in the form of the income tax.

It is nearly impossible to regulate controlled reporting on the production of river run gravel material because no one could project, be it with some remote accuracy, the quantities extracted, and the less so, identify the extraction site location, as is often the case with limestone quarries. This also renders impossible putting in place a scheme of control on gravel production, as there are two inaccurate parameters concerning re-evaluation:

- Quantity extracted at an extraction site location.
- Recovery of by-products, including sand and grit.

This almost keeps the revenues, due to the budget in the form of taxes under the item Quantity of Extraction, out of the evaluation scheme.

There might be some corrective coefficient on same surface area allocated for exploiting stuffs, with this coefficient taking into account the capability of a river segment for accommodating new gravel deposits, and a fixed exploitation tax divided by this coefficient. However, even this scenario would be surrounded by numerous problems arising from the chain-like exploitation activities along the riverbed carried out by
different subjects. This scheme will surely favour more those operating in the upstream area.

Levying of a sales tax would be closer to reality, which is basically a recovered and realised production. Regulating sales evidence is still an issue, which is however moving towards solution. Here care should be taken to ensure a coefficient allowing a comparative market for the by-products coming from the limestone quarries, which, of course, are of a higher cost, and the by-products coming from the river run gravel, which, overall, are of a lower cost. This coefficient of tax on river aggregates would significantly improve competition on the market, and would contribute to the battle to minimise river run gravel exploitation.

It is nonsense to address the river run gravel exploitation activities separately from the quarry exploitation activity, and to regulate them independently from the country’s mineral assets, despite the specifics surrounding the latter. All the mineral assets, including water, with the specifics surrounding each one of them being duly laid out, should be made subject to one legal and administrative line. This would help rationalise the control human resources, avoid unnecessary overlaps, and put in place unified policies. Of course, this places exploitation of old river terraces and riverbed exploitation in control by one hand, actually allowing room for abuse.
Prohibition of gravel exploitation in the Erzen has not yielded apparent results, and obviously, is not observed. Given that it is a highly profitable material on the market, and in view of a network of powerful investments in place, generally speaking, licensed gravel exploitation has switched into illegal exploitation of this material. Environmental damage has not been put a stop to, and rehabilitation projects have not been implemented. Under the said conditions, there is need to review the rational and comprehensive scheme so as to ensure alignment of investors’ interests in this area, the still undeveloped market, and environmental rehabilitation of the damaged riverbed.

In concrete terms, we would suggest a rehabilitation study for the whole of the Erzen River, starting from its emptying into the sea and the relationships between the sea and the river, then continuing with the downstream area while focussing on the fine deposits, which are on the increase and are a cause for floods in the future, and then continuing with the damage to the middle area and the possibilities for rehabilitation here, as well as the possibilities to obtain gravel material from deposits settled on a yearly basis, nature reserves for flows above normal, planting of quickly growing trees and fisheries. Hence, a number of river rehabilitation facilities along the whole length of the Erzen River are thereby designed, which would help promote care for the river, as well as the responsibilities and profits from the river. A next move would include ensuring the legal basis for this complex activity, work regulations and real implementation projects.

Building on this studied technical, legal, analytical and controllable basis, certain segments of the Erzen River would be given on concession. This would help provide a solution to the rehabilitation and exploitation of river aggregates without any technical-financial problems, and expand the range of the products obtained from the riverbed, thereby avoiding risks entailed by the way how they are working at present.
Digging area in riverbed, and turbidity caused by exploitation activity

9. Conclusions

A. During the preparation of this study, as processing of the data contained in both tables, on-site observations, pictures and drawings of the cross sections obtained from previous studies, was under way, it was noted that riverbed and riverbank gravel material is being exploited intensively, and the phenomenon of erosion and sedimentation in the Erzen riverbed is very much present.

On-site observations clearly indicated that the erosion phenomenon is the aftermath of the very intensive exploitation of the riverbed gravel. In the upstream area, erosion is due to the water flow, and particularly, the taking of gravel material by private companies.

Aside from the erosion phenomenon, which has more or less been a constant presence, following rainfall and increased river flow, the downstream area of the riverbed revealed increase in the riverbed quotas, and specifically, in the areas featuring more fine sand.
During the study period, we noted that, at given segments, they continue to illegally exploit the riverbed and river terrace gravel. Of course, no exploitation tax is paid for this type of exploitation activity.

During study, it was noted that, in certain cases, due to the exploitation of the gravel caves, the water flow has very intensively eroded the Erzen River floor and its banks.

Monitoring of the Erzen River revealed that the river banks may be affected by both the erosion the water flow causes, and the outright riverbank exploitation by private companies.

In other cases, the gravel cave exploitation phenomenon hit some parts of the arable lands close to the Erzen riverbanks, with these lands being bought by private individuals.

Following floods that occurred between September and October 2002, the Council of Ministers endorsed the decision prohibiting exploitation of gravel caves across all riverbeds. Private companies and the constructors’ associations reacted to this decision. Between October and December 2002, exploitation of gravel caves in certain riverbeds was interrupted. However, between January and May 2003, gravel caves in a number of rivers were illegally exploited.
The Council of Ministers instructed that studies were conducted to identify plausible riverbeds from where gravel material could be taken. A number of working groups with representatives from the ITNPM, the Albanian Geologic Survey and the Water Catchment Area Agencies undertook checks on all riverbeds, and identified where it was possible to continue to take gravel material from riverbeds for a five-year long period. This study was submitted to the Council of Ministers, and a number of decisions were taken with a view to regulating the riverbed gravel cave exploitation activity, and identifying a system for licensing private companies involved in this activity.

Following this decision, and further to the monitoring of the Erzen River, the negative phenomenon of riverbed gravel cave exploitation has not yet been eliminated. Of course, for objective reasons (including decreased gravel reserves, illegal exploitation activity, and government checks), the quantity of the gravel material taken away illegally is reduced by 1/3 as compared to the quantity taken away from the riverbed before the afore-mentioned Decision by the Council of Ministers utterly prohibiting exploitation activity, came into effect. At the same time, the number of subjects involved in building materials processing in this area has dropped from 22 to 14.

B. The check on revenues from gravel exploitation activity in the Erzen River seems to reveal obvious shortcomings. In terms of sand and gravel exploitation activity in Erzen, royalties and surface taxes, defined by law, are not collected. Other revenues generated
by the processing operations, including profit tax, are collected in relation to the general coefficient indicating the collection of taxes country-wide.

On-site inspection of the Erzen riverbed, and the different accounts provided by the Water Department responsible for the Erzen River, and the stocks found on companies’ sites, were indicative of the finding that presently 14 subjects are involved in illegal exploitation activity in this river, with an annual gravel turnout of around 250 thousand m³.

An approximate estimation indicates that, considering the payments due to be made{under the Mining Law, as royalty and surface tax}, this illegal activity is causing the State a loss of revenues to the tune of 2 million lekë.

There can be no talk of producing accurate data on the other rivers in the country, where river aggregates register an intensive, though permitted, exploitation activity, given that it did not fall into the scope of this report. The amount of river gravels taken away from other rivers across the country is over six times higher than that estimated for the Erzen River.

Regulation of this activity can be achieved by modifying the legal and technical concept of it, and by moving on to river rehabilitation projects. A river rehabilitation project is built on a comprehensive study of any riverbed from the perspective of its environment, and translates the river into a source of revenues deriving from sand and gravel, the accelerated growth of forests along its banks, and the fisheries, and at the same time, avoids the erosion, and flooding issues.

Strengthening financial discipline instrumental in managing the enterprises across the country, in accordance with legislation, of course adds to increased revenues to be generated from the exploitation of river aggregates, as well. In this framework, correct administration of purchases and sales books, without overlooking any client, and fully eliminating purchases in cash (without being supported by vouchers), would provide the tool for really and successfully checking this activity.

Exploitation of riverbed aggregates is not made subject to supervision by the same bodies supervising other building materials (stone pits). Hence, such activity is not made subject to the good controlled procedures of licensing and practical activity underlying the Albanian Geologic Survey and the National Agency for Natural Resources, as the responsible technical control institutions at all the levels of licensing, designing and exploitation, as well as a solid legal basis, including Mining Law. I share the opinion that this link in the organisation needs also be reviewed, so as to help upgrade the entire establishment conducive to the river aggregate exploitation.
Hence, we continue to point out as follows:

1. They continue to exploit, without a legal permit, gravel material across the length of the Erzen River, wherever it is found and is required.

2. The Erzen River gravel material continues to be exploited without legal permit, without any projects or criteria regulating exploitation being put in place, and given the current structures available to the Water Secretariat, it is practically impossible to supervise exploitation of gravel caves.

3. Intensive exploitation of the gravel material, without any criterion and in an intensive way, has largely impacted on the change in the hydraulic regime. Hence, hydraulic flow exerts greater force on the riverbed floor and the subterranean waters.

4. In certain cases, constant taking of the gravel material from the Erzen River, as far as close to the riverbank, has damaged the farming lands close to the riverbank, which potentially threaten to cause other damage in the future.

5. We have noted that taking of gravel material from the Erzen riverbed, in the vicinity of civil engineering works, have created premises for their damage, and this is dangerous to civil works with shallow foundations.
6. We have found out that no exploitation tax is paid for all the amount of the gravel material exploited, and no exploitation tax can be paid given the current organisation, and the shortcomings identified. Is this an issue with the other rivers in the country, where subjects are operating on the basis of an exploitation permit? This remains to be seen. In advance, we share the opinion that, with regard to both the stone pit activities and river aggregate exploitation for which licenses are issued, leakage in obligations to the State is noted. Authorisation of a check on registers (if any), or tax bills, which overall helps provide evidence to that end, would ascertain the fact, and would be the starting point for the legal and organisational re-engineering of the royalty and surface tax for the area allotted for exploitation. This does not cover selling in cash for small buyers, who are building in rural areas, and other regional consumers of this type, who may approximately be identified by constructions, in the course of a long supervision process.

7. We suggest that the river protection concept should dramatically be changed, placing implementation of river rehabilitation projects on a quite different basis and on studies of proper implementation projects.

8. This would turn the river into an asset for the private sector, which may be administrated on the basis of established criteria.

9. We propose that the organisation of institutions responsible for river protection is changed, by putting in place appropriate legislation and unified institutions dealing with other mineral assets, with the specifics of this activity being retained. This would also allow that river exploitation be made subject to supervision by specialised technical institutions, including the National Agency for Natural Resources and the Albanian Geologic Survey.

10. Most important experience applied in Kosova included the functioning of such entity, the ICMM, totally focused on minerals exploration and mining units management only, not mixed with other branches of industry, including the HPP-s and hydrocarbons, as in Albania.

So, our conclusion is that such a thing must be applied in Albania, too, i.e., to separate the National Agency for Natural Resources from other things (is a useless overload mainly in terms of management efficiency), except the geologic-mining units management, monitoring, thus enhancing the degree of transparency in the production and sales reporting and efficiency of all the chains connected with such item. This idea begins to be implemented with the National Centre of Licensing (one stop shop), which is still in the first steps of its work.
11. The conclusions drawn about exploitation of gravels in the Erzen River concern an extreme case, given that here we have to do with an area where exploitation activity is prohibited with Decision by the Council of Ministers, and on a floor where deposits are in extinction. From the media and the responsible institutions, we have learnt that leakage in payments due to the State is tangible at different levels, regarding the rivers where exploitation activity is legally permitted, as well. In certain areas, environmental problems are more tangible in other rivers. A comprehensive conclusion and an obviously more correct approach may be reached if this report also covered the exploitation activity in the main rivers, including Shhkumbin, Mat and Vjosa.

Dr. Martin Cukalla