

KOSOVO QUARRY PLAN

Zenun Elezaj

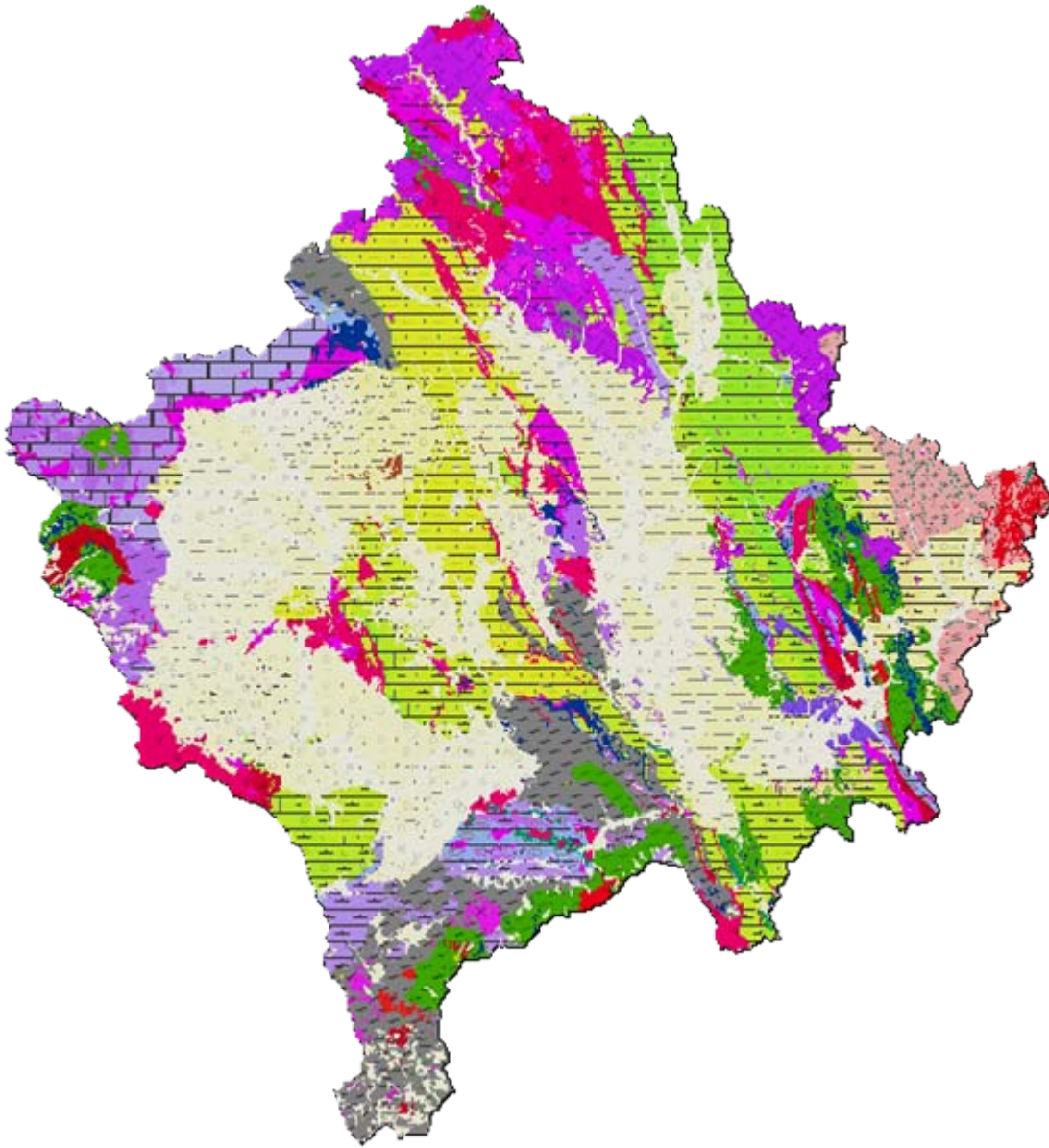
Ljubljana, 20-22 September 2011

Kosova's Geography



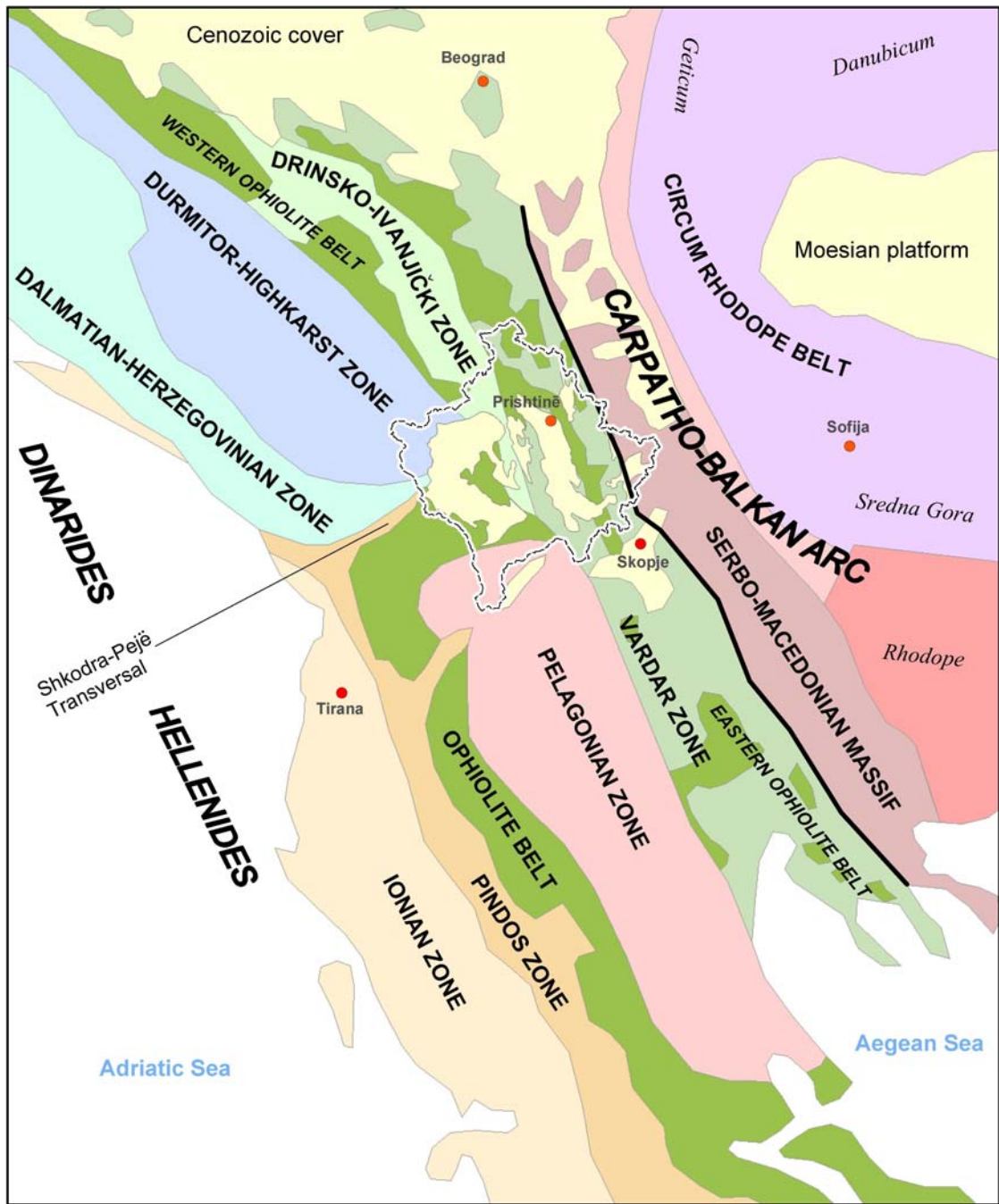
- ❑ Located at the center of Balkans
- ❑ Surface - 10,887 km²
- ❑ Average altitude - 800 m above sea level
- ❑ Continental climate predominates
- ❑ Country's infrastructure is well developed
 - A fully developed road network does exist
 - There are several main roads connecting the large towns of Kosova and its territory with the neighboring countries
 - There are railway tracks to Macedonia and Serbia

Geological-Geotectonic Setting



- From the geological point of view, Kosovo is a very interesting territory.
- The area of Kosovo is characterised by a variety of geological formations.
- Among these are rocks ranging from old crystalline Proterozoic to Quaternary age comprising sedimentary and magmatic types together with rather less frequent metamorphic rocks.

Kosova's Tectonic Complexity in regional aspect



- Kosova territory is the place where the Dinaride structures are closer to Balkanide structures.
- The Dinaride structures (in broad sense) showing the characteristic "Dinaric" extension in the neighboring areas, in the Kosova territory surprisingly display an essential deviation.
- All above mentioned manifestations are due to the presence of Shkoder-Peje transversal belt.

FUNCTIONING OF MINERAL SECTOR IN KOSOVO AND LICENCING

- In September 2010 has entry into force New Law on Mines and Miner Minerals, Nr. 03/L-163.
- By this Law competent institutions for mineral sector in Kosova are:
 - Ministry for Economic Development and
 - Independent Commission for Mines and Minerals.
- Ministries for Economic Development responsibility's are:
 - Prepares policies, strategies and legislative framework for mining and mineral sector development in Kosovo, and organizes work on their implementation;
 - Promotes mineral resources of Kosovo for research and exploitation;
 - Monitor the issuance by the independent mining regulator of licenses and permits for mining activities in Kosovo;
 - Supports creation of a favorable environment for private investment in the mining field.

- Functions of Independent Commission for Mines and Minerals are:
 - Independent Commission for Mines and Minerals is an independent regulatory body responsible for regulating and monitoring the mining industry in Kosovo;
 - The issuing, transfer, extension, suspension and revocation of exploration and exploitation licenses and permits;
 - The issuing, suspension and revocation of permits and licenses related to the use of explosives in mining operations.

LICENCING PROCES IN KOSOVA

- License types for construction minerals are:
 - exploration,
 - retention and
 - exploitation license.

- Exploration license for construction minerals is valid for two years and may be extended for an additional two years. There is a maximum area of 250 ha per individual license.

- Retention license for construction minerals is maximum of one year from expiry of the exploration license.

- Exploitation license for construction minerals shall have a maximum term of no more than twenty five (25) years, and may be extendable for an additional term having a maximum duration of twenty five (25) years.



KOSOVO QUARRY PLAN

- The term Construction Raw Material is not strongly defined in this presentation.
- Construction raw materials include all kind of hard rocks usable as primary aggregates, as dimension and decorative stones, as raw material for cement, lime and brick construction as well as silica sand. Not included are energy minerals, sulphate rocks, salt, special clays (halloysite, allophane, illite, hormite) and silica raw materials (diatomite, cristobalite and opal, tripoli and siliceous earth).
- The Kosovo Quarry Plan, it contains an inventory of the complete surface-mineability construction mineral potential of the Kosovo territory, an inventory of the existing exploitation sites, estimate of minerals demand for the next 10 years and recommendations for further development.
- The Kosovo Quarry Plan is an excellent tool for outlining existing and potential mining sites and for the protection of licensed deposits in the frame of spatial plans and mining industry development plans.
- Kosovo Quarry Plan is the best and environmentally mining policy document, which support sustainable mining, processing and use of construction minerals in Kosovo.

EVALUATION AND RANKING OF DEPOSITS

- Based on the existing legislation, a methodology was developed that consists of the following core elements:
 - The selection of non-blocked parts of mineral deposits and occurrences,
 - The evaluation of the non-blocked deposits (Definition of potential mining areas, evaluation of them),
 - The ranking of the deposits according to their mineability value and legal status (Definition of future potential mining assets),

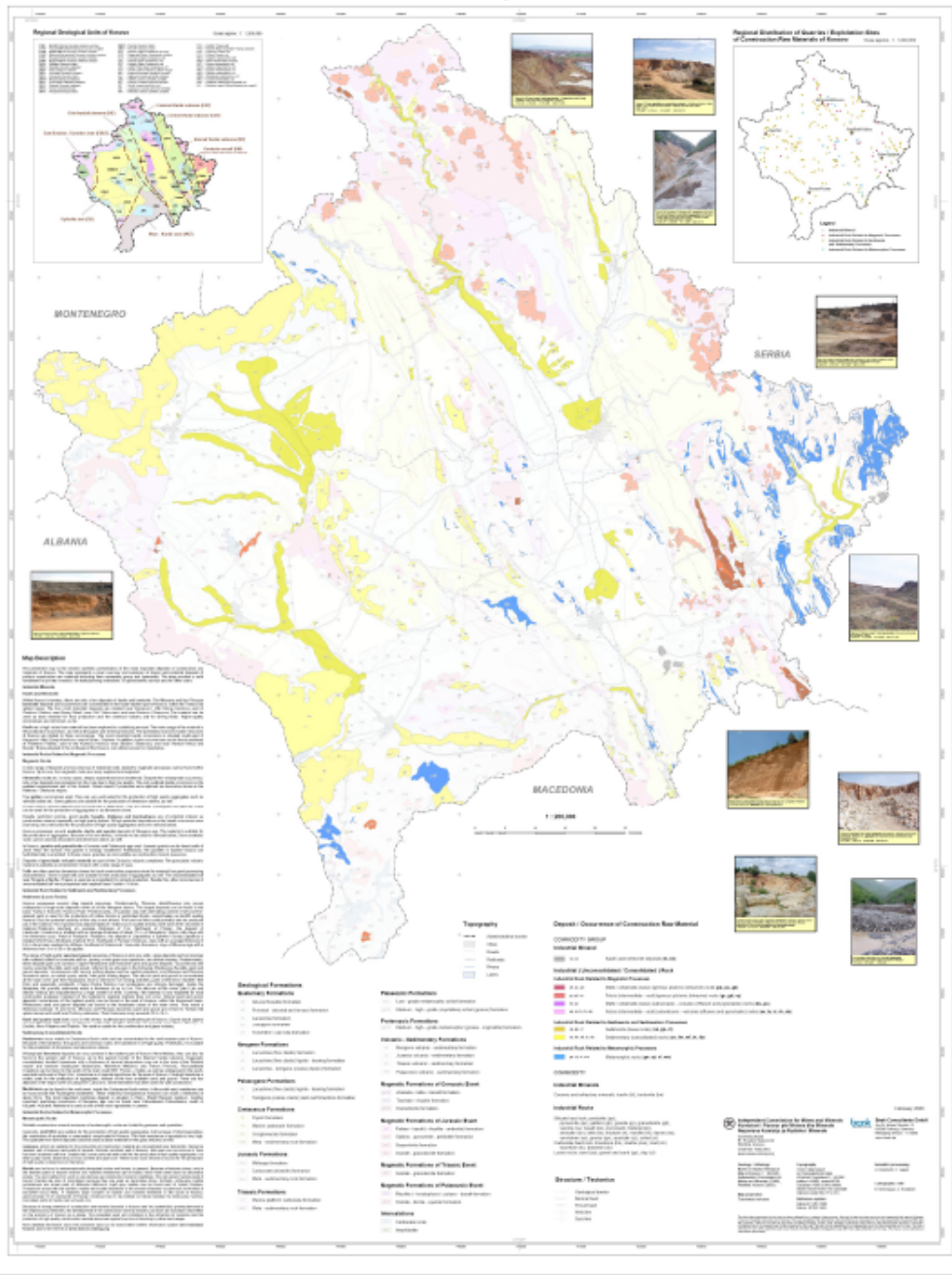
- All non-blocked (that means: not situated within settlements, roads, rivers etc.) deposits were selected based on the available primary data.
 - Evaluation of mineability,
 - Evaluation of legal status, and
 - Evaluation of the deposit protection value.

EVALUATION AND RANKING OF DEPOSITS

- Every non-blocked deposit was characterised by a value of mineability and deposit protection, which was influenced by the following seven parameters:
 - legal status,
 - deposit's thickness,
 - stripping ratio,
 - geological reserves,
 - knowledge,
 - quality and
 - connection to the main infrastructural network.
- Finally, all non-blocked deposits were ranked concerning their mineability and deposits protection.

CONSTRUCTION RAW MATERIAL MAP OF KOSOVO

Scale 1 : 200,000



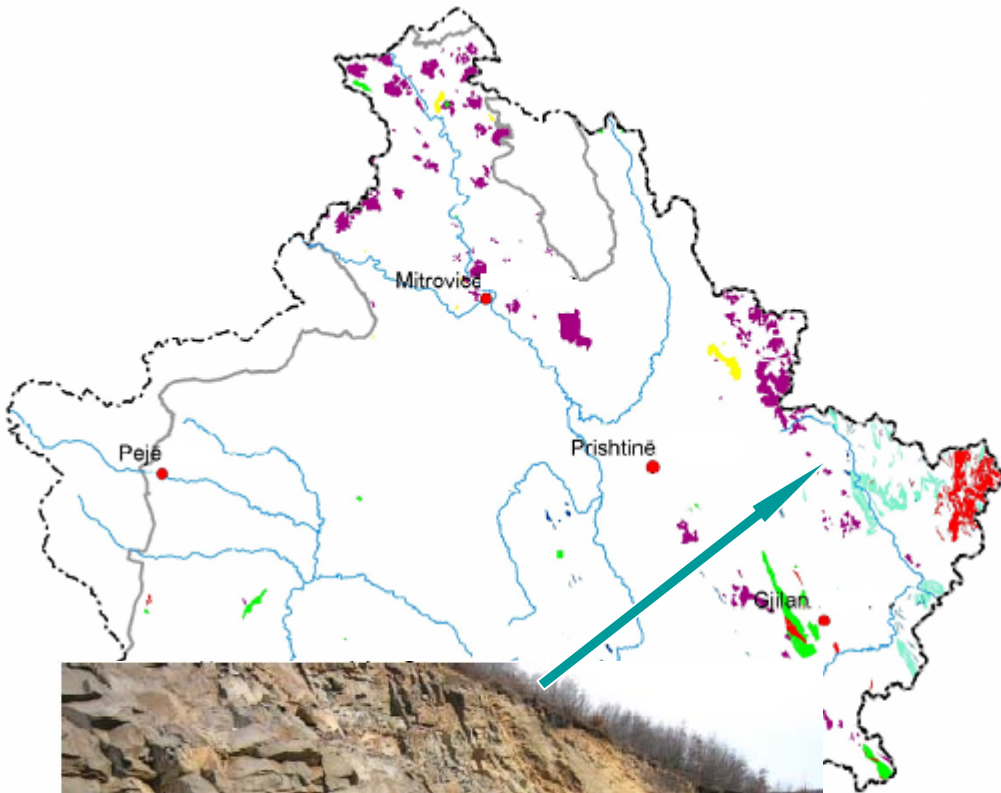
- The main goal of the Construction Raw Material Map is the presentation of deposits and occurrences of surface construction raw materials in Kosovo at a scale of 1 : 200,000.
- The mineral deposits have been ranked with regard to their value and legal status, and a preference list of deposits for further exploration and / or exploitation.
- On the maps, the deposits and occurrences, represented by:
 - deposit number,
 - commodity group:
 - silicate and carbonate hard rocks,
 - gravel, sand and clay, bentonite and kaolin) and
 - status of geological knowledge (state of exploration) in summary with their geological background (main geological formations).

CONSTRUCTION RAW MATERIAL POTENTIAL AND ESTIMATE OF FUTURE DEMAND

- Calculation **estimates** of future demand of construction raw materials in Kosovo are based on assumptions in terms of population / household growth rate, construction / maintenance of new roads and railways according to EU standards, enlargement and rehabilitation of water supply, improvement of urban and rural infrastructure and rehabilitation and new construction of industrial objects, commercial and public buildings.
- No assumptions were made concerning the use of secondary aggregates (construction and demolition waste, secondary materials) because of the currently low reuse rate and missing data.
- The following demands for construction minerals for the next ten years were estimated and are shown in relation to the maximum reserves of deposits.

Commodity Group	Demand for next 10 years (Thousand tones)	Geological Reserves with highest Protection Value (Thousand tones)
Silicate Hard Rocks	50,000	14,289,000
Carbonate Hard Rocks	90,000	13,510,000
Gravel and Sand	70,000	233,000
Clay, Kaolin and Bentonite	20,000	939,000

SILICATE HARD ROCK



- According to the exploitation licenses issued, the estimated percentage of silicate hard rocks used as ballast, grit etc., and as dimension stones is much less than that of carbonate hard rocks and less than that of gravel and sand.
- Estimated geological reserves are about 14,289 million tonnes.
- If only ten percent of these reserves can be used for the foreseen purposes, there will be enough silicate hard rocks for the next 285 years.
- At present the licensed deposits (approved and active licenses) do not cover the estimated demand for (higher quality) silicate hard rocks for the next 10 years.



Andesite Quarry Krilev-Dardane

■ sandstones

Reserves

■ sandstones, dacites, latites, pyroclastics

Basalts

■ gabbros, peridotites, gneisses, schists, amphibolites, gneisses, phyllites

CARBONATE HARD ROCK



Carbonate Hard Rock Deposit (Marble) in the Surrounding Area of Deçan

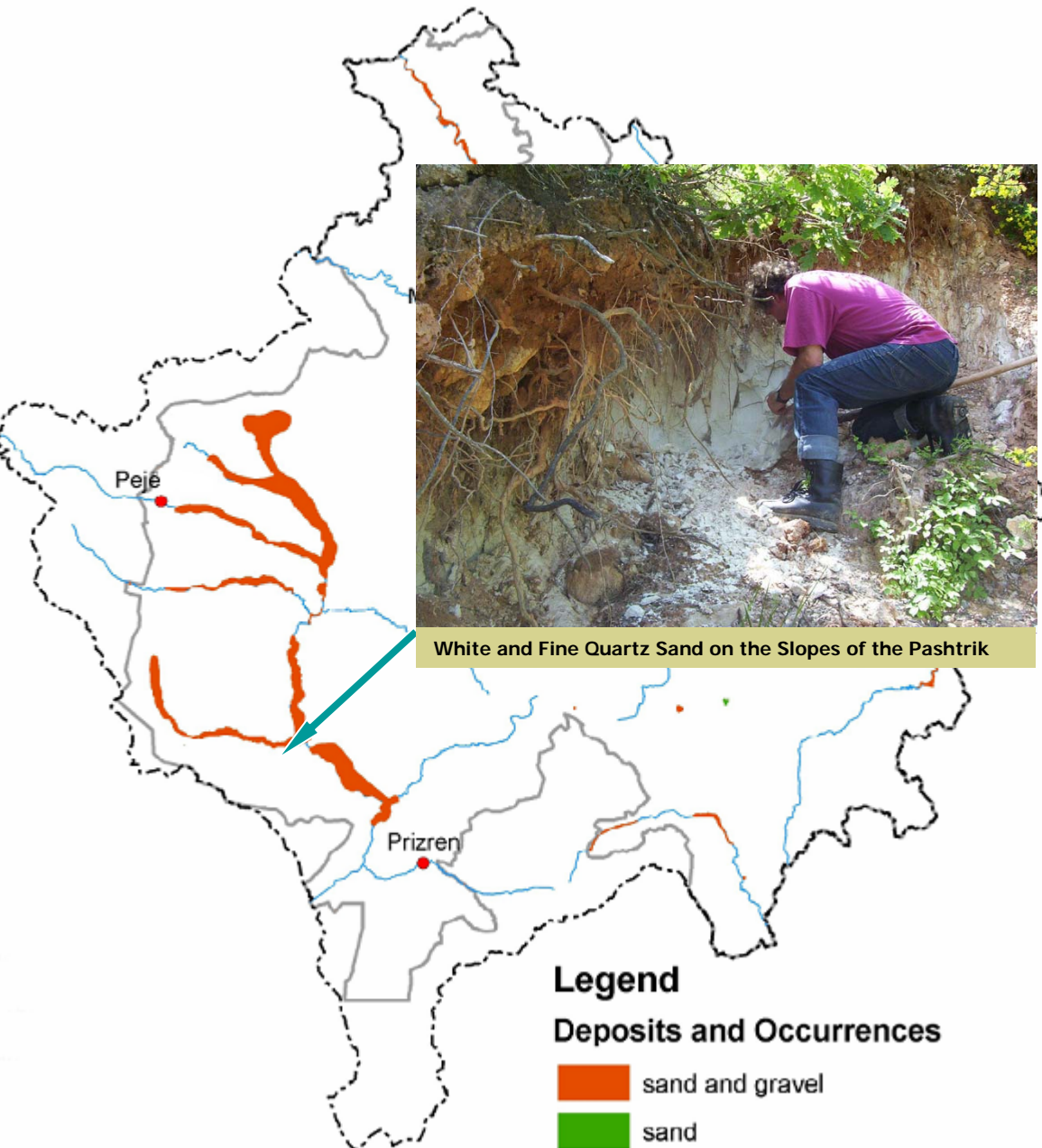
It is estimated that about 45 % of mined primary aggregates are carbonate hard rocks.

The estimated geological reserves of carbonate hard rocks with the highest Protection Value are about 510 million tonnes.

If one quarter of these reserves can be used for the foreseen purposes, there will be enough carbonate hard rocks for the next 375 years.



SAND AND GRAVEL



White and Fine Quartz Sand on the Slopes of the Pashtrik

Demand for next ten years is about 70 million tones and estimated geological reserves with the highest Protection Value are about 233 million tonnes.

Because of some differences between aggregate and hard rock deposit geometry, more than 60 % of reserves seem to be mineable in practice.

Considering this fact, the available reserves will only last for about 20 years.

At the end of this decade, gravel and sand deposits will therefore have to be substituted by silicate and carbonate hard rocks.

CLAY, KAOLIN AND BENTONITE



Clay Open Pit in the Surrounding Area of Skenderaj

According to both estimates, the demand for clay, including bentonite and kaolin, will be about 20 million tonnes for next 10 years.

The annual demand is mainly based on household growth within the next 10 years.

The estimated geological reserves of clay, bentonite and kaolin with the highest Protection Value are about 939 million tonnes.

When we proceed on the assumption, that about two thirds of the estimated reserves can be used for brickmaking and other relevant purposes, the available reserves will last for the next 300 years.

CONCLUSIONS

- Kosovo Quarry Plan summarizes all relevant available data on construction minerals, the construction mineral demand and base planning data.
- Within the frame of the Kosovo Quarry Plan, construction minerals of high quality and mineability were identified as follows:
 - Within the group of silicate hard rocks, gabbros and ophiolitic rocks were identified as high quality aggregates.
 - Well suited for engineering construction purposes are fine grained gneisses, as well as andesites and quartzites. At the moment, these rock types are only mined in a limited amount.
 - Recrystallised limestones and marbles are also a source of high quality aggregates. Currently, they are of fundamental importance for the aggregate supply of Kosovo.
 - Material from alluvial sand and gravel deposits is mainly used as concrete add-on.
 - Gravel deposits are of low thickness and size and often blocked by other land use purposes.
 - Pliocene clay occurs widespread and in large deposits.

RECOMMENDATION

- Continuation of the exploitation site data capture.
- Continuation of implementation of certifications and quality control of the exploited material according to European standards.
- Focusing of exploration activities on large-scale construction raw material occurrences of high mineability values that could satisfy Kosovo's demand for further decades.
- Intensification of measures to prevent and stop environmental damage by illegal operations.
- Expansion of mineral industry to meet the demands of the neighbouring countries (strengthening of the export potential of Kosovo).
- Definition of Mineral Protection Areas, protection especially of the high class deposits against blocking by other land use.
- Implementation of the Kosovo Quarry Plan results into spatial plans and mining industry development plans.

Because of strong construction activities in Kosovo and the (potentially) growing demand in the neighboring countries, the development of the construction mineral industry can have an important initial effect on the economy of Kosovo as a whole.

Thank you for Attention !