



Newsletter No.3: Special Update on Eurolithos Deliverable D.5 “Ornamental Stone Heritage” 12 Case Studies

Overview

This is an update on the progress on EuroLithos Deliverable 5 “Ornamental Stone Heritage.” Early this year the EuroLithos partner, the Croatian Geological Survey delivered their case study overview (D5.1) which identified the 12 case studies that will be conducted under four themes: Ornamental stone resource value assessment, Stone and built heritage, **Stone and intangible heritage**; and Sustainability. The task group involves of 8 Eurolithos partners:

- Geological Survey of Norway (NGU)
- Geological Survey of Slovenia (GeoZS)
- Geological Institute of Romania (IGR)
- Italian Institute for Environmental Protection and Research (ISPRA)
- Croatian Geological Survey (HGI-CGS)
- Cyprus Geological Survey Department (GSD)
- Geological Survey of Spain (IGME)
- The National Laboratory of Energy and Geology (LNEG)

From M1- M18 the working group developed project concepts and methodologies that will be addressed in the 12 case studies described in this report. Eurolithos WP5 aims to establish tools to assist in the valorization of stone resources. We believe that such tools will lead to develop of policy that ensures improved of stone-built heritage, better conditions for SME’s and better protection of stone resources in land-use planning.

The 12 case studies on Ornamental Stone Heritage

[Assessment of large quarry landscapes \(Iddefjord granite quarry, Norway\)](#)

[Heritage assessment of historical quarry \(Magura Calanului, Romania\)](#)

[Heritage assessment of quarry landscapes \(Pučišća, Brač, Croatia\)](#)

[Open data solutions for linking ornamental stone resources with buildings \(Trondheim, Norway\)](#)

[The use of calcarenite as built stone from antiquity to recent times \(Nicosia, Cyprus\)](#)

[Linking natural stone from the island of Brač, with built heritage \(Croatia\)](#)

[Stone and built heritage: the Carrara Marble \(Alpi Apuane District\)](#)

[Traditional crafts in modern stone production \(Norway\)](#)

[The Pučišća stonemason school \(Croatia\)](#)

[Sustainable stone production \(Norway, Portugal\)](#)

[Best practices of natural stone valorization for the preservation of stone-built heritage: the case of platy limestone as characteristic element of cultural landscape along the Eastern Adriatic coast.](#)

[Synergistic effect of quarry landscapes with overlapping active and historical quarries \(Macael, SE Spain\)](#)

Ornamental stone resource value assessment – Case Studies

Ornamental stone has been used since the dawn of civilization, shaping our cities and cultural identity. The production of stone results in the formation of quarry landscapes that are of value - economically, historically and culturally. Eurolithos case studies aim to establish guidelines and best practices in the identifying, describing and interpreting characteristics of quarrying and quarry landscapes, and ultimately for assessing value. For areal planning and exploitation increased knowledge of ancient quarries is crucial. Case Studies under this theme are as follows:

1. Assessment of large quarry landscapes (Iddefjord granite quarry, Norway)

At present time only one quarry is in operation. NGU will present a summary of the geology and evolution of quarrying and quarry technology to provide an insight in the economic and non-economic values within the quarry landscape. (Stakeholders: local granite industries, cultural heritage authorities, regional/local administration)

2. Heritage assessment of historical quarry (Magura Calanului, Romania)

In partnership with municipal council and the Dacica Foundation, IGR lead this case-study. Participants maintain that source-area of stone for historical monuments has heritage value and deserves recognition. The World Heritage listed Dacian fortresses were built from limestone produced from the Măgura Călanului quarry 30-50 km away. Numerous potential stakeholders have been identified by the leaders of case study; two foundations, one NGO and due to proximity UNESCO Global Geopark Dinosaurs Geopark Tara Hategului tourism and scientific community.

3. Heritage assessment of quarry landscapes (Pučišća, Brač, Croatia)

Historically, natural stone has been excavated on island of Brač and an important excavation site today lies near the island municipality of Pučišća. The stones are prominently used in Croatia ([here](#), [here](#), [here](#)), and in buildings across the globe, including the White House in Washington, and the parliament buildings in Vienna and Budapest. HGI-CGS leads this case study that will explore a system of best practice in identification, description, and interpretation of features of quarrying, i.e. defining and delineating the quarry landscape.

Stone and built heritage – Case Studies

Not much has changed in how ornamental stone has been used since antiquity and stone craft traditions have become an inseparable part national identity. Many ancient

quarries are still in use, but most have either been long abandoned resulting in a limited access to crucial European stone resources - the impact of this is still unknown. The chosen case studies will allow Eurolithos participants focus on tools for linking spatial data (quarry/resource location) with stone resource use in new and older construction. Case Studies under this theme are as follows:

4. Open data solutions for linking ornamental stone resources with buildings (Trondheim, Norway)

Revealing the connection between the source natural stone and the 'built' urban environment may illuminate the importance of a raw material. The historic importance of the stone resource is reflected in 'time-depth', while the geographic extent of its use may bestow a national or international significance to a stone resource. We will explore 'open' solutions such as "crowdsourcing" could serve as a method to link with stone resources to European mineral resource platforms. In particular, this case study will explore the use of wiki-solutions (such as [Open Streetmap](#)) as tools for such interactions.

5. The use of calcarenite as built stone from antiquity to recent times (Nicosia, Cyprus)

Throughout Europe, unique ornamental stones are vital to local/regional heritage whether it has been applied to a single dwelling or an entire town. Many of these stone buildings have attracted visitors over century due to their historical cultural value. However, it is not easy to find information about the building stone and how it is related to history. The legal frameworks and best practices for building conservation will be examined in this task group led by GSD in partnership with local municipal agencies. And the source of the ornamental stone will be identified, and the geology, history, landscape and use will be detailed for selected heritage buildings.

6. Linking natural stone from the island of Brač, with built heritage (Croatia)



Stone use and ancient/old quarrying, Nicosia. Presidential Palace in Nicosia and calcarenite quarry in The Mamhari village west of the City of Nicosia

HGI-CGS together with stakeholders in education and municipal authorities will conduct this case study of Brač stone. To maintain the stone-built heritage, the original sources of stone must be available, or at least, stones of similar quality and appearance. The case study will investigate a range of buildings made of Brač stone and explore how these can be sourced to various parts of

the limestone resources. This will provide tools for 1) assess the importance of the

stone resources from their use in the built heritage, and 2) identify future needs for stone in the maintenance of the built heritage and implications for stone resource management.

7. Stone and built heritage: the Carrara Marble (Alpi Apuane District)

ISPRA leads the case study that aims to disclose evidence of ancient technologies, trade and anthropic development numerous ancient extraction sites. Ideally, the original source is important for stone-built heritage and the cultural landscapes. At minimum, stones of similar quality and appearance must be found. Immaterial heritage, namely stone crafts and skills must also be preserved. Amongst their activities, researchers hope to propose best practice and guidelines for inventories linking stone resources to built-heritage. Industry, government and cultural heritage agencies will join ISPRA in this task.

Stone and intangible heritage (crafts) – Case Studies



Traditional breaking of schist slabs, Oppdal, Norway

Traditional stone craft is still vital to producing ornamental stone and without intervention this craft could become extinct in some areas of Europe. To counter the negative trend, stone-mason's schools have been established, some of which offer specialized knowledge, like the use of Roman hand tools stone dressing. In other countries, businesses profit from the investing in ancient crafts. This group of case studies will explore the importance of crafts and traditional skills, both

from an industrial point of view and from a public one – the need for education.

8. Traditional crafts in modern stone production (Norway)

Eurolithos partner NGU, along with schist producers Oppdalsten AS and Minera AS will participate in this case study. Participants recognize that traditional craft are often needed despite the heavy application of quarrying and processing technology. How are traditional crafts are used in modern stone production? Can advanced technology and live symbiotically with traditional craft, in the schist production industry? Participants will closely examine at the value chain in the production and how technology and crafts interact in the different stages.

9. The Pučišća stonemason school (Croatia)



Stone-mason school and student work (lion) in Pučišća, Island of Brač, Croatia. Photo: TR Mitchell

Eurolithos partners HGI-CGS will examine the Stone-mason's school in town Pučišća in Brač, who over one hundred years continues tradition of processing natural stone. The school is known for using ancient Roman hand tools when dressing stone. The school is the only place in Croatia and EU where one can obtain a professional qualification in stonemasonry. In this study case we will present the Stone-mason's school in Pučišća as example of the interaction between stone resources and humans has produced a rich and diversified immaterial heritage, namely crafts and skills. Industry, education, municipalities, heritage authorities are all identified as stakeholders in this case study.

Sustainability and ornamental stone

10. Sustainable stone production (Norway, Portugal)

Along with Lundhs AS and Minera AS, NGU seeks to collect and explore how “sustainability” can be applied to ornamental stone production. In particular, concepts related to “zero waste”, land use, carbon footprints and societal license to operate. The case study will collect existing data from industry and research and make a systematic compilation and interpretation that can lead to definition of best practice and guidelines. The production of ornamental stone in Norway (Larvikite and Oppdal schist) will be examined, where waste rock has been reduced substantially. In addition the challenges of production of limestone from MCE, 150 KM north of Lisbon, in Portugal will be examined. In the latter example, national and regional public authorities, the geological survey, private consultants and the industry in Portugal together cooperated to achieve rational management of the extractive industry.



One of many quarries in Larvikite, SE Norway

(Environmental Product Declaration) for ornamental stone, and explores the various aspects of this.

In the future, also the stone industry needs to adapt and provide documentation of environmental footprints and ethical standards for being able to supply stone products to many customers. On the other hand, such procedures may strengthen the European stone industry, since they emphasize the need for other criteria than strictly economic in tenders. The case study provides examples of the use of EPD

Case study covering several subject areas

11. Best practices of natural stone valorization for the preservation of stone-built heritage: the case of platy limestone as characteristic element of cultural landscape along the Eastern Adriatic coast.

Access traditionally-used autochthonous building material, like platy limestone, is a key to preserving cultural landscape and stone-built heritage along the Eastern Adriatic coast. Eurolithos partners GeoZS and HGI-CGS identify that guidelines are needed to promote sustainable use of natural stone as building material, the conservation of the natural stone resources and for conservation of stone-built cultural heritage. Replacing traditionally used stone with non-autochthonous stone or other materials, has often resulted in damage, destruction and decay of stone buildings. Researchers in the Eastern Adriatic region have addressed these problems from all aspects; that is, from geological characterization of platy limestone, its occurrence and excavation potential to its use in architecture, natural and cultural heritage preservation, and legislative framework.

This is a Europe-wide issue, therefore participants hope to provide a system of best practice protocols in identification, valorization, promotion and sustainable use of natural stone as a building material. Land use planner, educators, local and heritage authorities are all interested in the results of this case study.

12. Synergistic effect of quarry landscapes with overlapping active and historical quarries (Macael, SE Spain)



Marble quarry in the Macael area, Spain

Often the development of quarries over is perceived as risky. Untethered development can lead to obliteration of historic quarries, and with it geo-archaeological and ethnologic information. Consequently, the declaration of future new extractive areas should consider the presence, location and importance of pre-existent quarries in order to avoid irreparable losses.

Unfortunately, active quarrying today occurs on historical quarry fronts (more or less old). This dual reality (modern-ancient works) can provide an excellent opportunity to increase the interest and the heritage value of the quarry landscape.

Current quarry landscape in Macael region alternates active quarry fronts with a few areas with remains of manual stone-work. Researchers look to the synergy between historical and modern realities can be raised from different aspects. From a didactic and touristic point of view, the co-existence of both types of stone works (modern-ancient) makes it possible to compare and to explain the evolution of the stone-work methodology along the time, increasing the global interest of the landscape. Stakeholders here include industry, land use planning, heritage authorities and local authorities

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