WATERFRONT DIALECTICS

ROME AND ITS REGION FACING CLIMATE CHANGE IMPACTS

Edited by:
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Colophon

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Table of Contents

Introduction

Part 1. Rome Coastal System

Projects results

Part 2. Rome and the Tiber

Projects results

Part 3. Rome Aniene River

Projects results

Part 4. Water as a Lifeline for Rome

Sapienza University of Rome Elena Paudice

White and Blue
Water and Travertine Landscapes Along the Aniene

Cuts in the Landscape

Traveling along the Tiburtina road from Rome to Tivoli near the Bagni di Tivoli hamlet, the landscape is made up of dense buildings, including the imposing access to the thermal establishments of Tivoli, squeezed between anonymous commercial spaces that ruin the ancient baths.

Once past the thermal establishments, proceeding towards the city of Tivoli, the building stops almost abruptly and the edges are defined by the white landscape of the travertine quarries, which hide the silent flow of the Aniene river, parallel to the Tiburtina road.

Travertine quarries tell the story of Lazio architecture, as this material has contributed to the creation of important architectural works and various monuments[1], becoming, over the centuries, one of the representative products of the region, as well as one of the main sources; however uncontrolled extraction has profoundly changed the morphology of the area today characterized by a settlement and functional discontinuity.

The correlation of extraction sites with inhabited centers and valuable naturalistic elements, such as the Acque Albulae basin, as well as the Aniene river, involves various problems, including soil consumption and possible groundwater pollution, with respect to which the municipal and regional policies adopted so far have proved inadequate and ineffective.

It is necessary to plan recovery actions for disused quarries and management policies for active quarries in order to transform the extractive basin into a place in harmony with the surrounding landscape.

White Landscapes: the Travertine Quarries of Tivoli and Guidonia Montecelio

The former quarries represent opportunities to recreate a link between the artificial landscape and the natural landscape, to establish new relationships between an apparently inhospitable place and the adjacent communities, to recreate a now interrupted naturalistic continuity.

Abandoned quarries can become new landscapes, and it is not always advisable to bring them back to their original state since they have now become, for better or for worse, a characterizing element of that territory, as in the case of the abandoned quarries of Tivoli and Guidonia Montecelio.

1. Travertine has been used for the construction of numerous valuable architectural works including: the Temple of Concordia, the Trevi Fountain, the Four Rivers Fountain, the monumental buildings of EUR, the University City and Termini Station.

Figure 1. View of the Barco quarry, the oldest quarry in the extractive basin.

Alongside this “empty” landscape, agricultural areas and settlements have developed over time. The different environmental situations form a complex territorial mosaic, an interweaving of different landscape typologies that tell the difficult context in which the travertine quarries are inserted.

In this context, the only connecting element appears to be the Aniene river which delimits these enormous environmental “caesuras” to the south.

The quarries have developed over the centuries along the banks of the Aniene river and between the outcropping lakes of sulphurous water, belonging to the hydrographic basin of the Acque Albulae. It is precisely the presence of sulphurous water that makes travertine such a precious material that it has been extracted since ancient times, its name in fact derives from the Latin denomination, from the late imperial age, lapis tiburtinus, the stone of Tibur (Tivoli). even if the origins of some extraction sites are in any case older, the first local uses date back to the 3rd century. B.C.

Over the centuries the extraction of travertine has taken place almost incessantly[2] and despite the great use the basin has maintained a limited size but, starting from the eighties of the last

2. In late antiquity, and during the Middle Ages, mining stopped and the quarries slowly turned into a marshy area. The extensive use of travertine resumed in the Renaissance, when Rome returned to being a “white city” and, when the construction of St. Peter’s began, the ancient quarries were reopened.

century, the withdrawal of travertine has increased up to having a single basin of 400 hectares[3]. To date, the basin is made up of a series of partly abandoned contiguous quarries for which there is a considerable fragmentation of the state property regime, in particular there are 17 industries in the area, some of which refer to the ancient valorisation of the Roman Travertine Center. Furthermore, the reference regional law, n. 17 of 2004, appears ambiguous regarding the recovery works, to which is added a discordant management of the two reference Municipalities: the site is administered for 32% by the Municipality of Tivoli and for 68% from the municipality of Guidonia Montecelio.

The two municipalities currently do not follow a shared management line despite both having supported the excavation of travertine for decades without guaranteeing the recovery of the abandoned quarries. The Municipality of Tivoli mainly concentrated on the creation of a thermal park in some disused quarries located along the banks of the Aniene river; while the municipality of Guidonia Montecelio has not advanced recovery projects, focusing exclusively on the continuity of the excavation to protect the extractive industry.

For several years the quarries were seen only as a source of economic and employment development, in fact various industrial activities developed around the basin, even close to the river, involving various problems including:

- the underlying perennially outcropping aquifer;
- the possible pollution of the waters of the Aniene river;
- the settlement discontinuity;
- the development of the extractive industry near urban areas, as well as natural areas;
- the fragmentation of the property regime;
- uneven and ineffective local and regional policies.

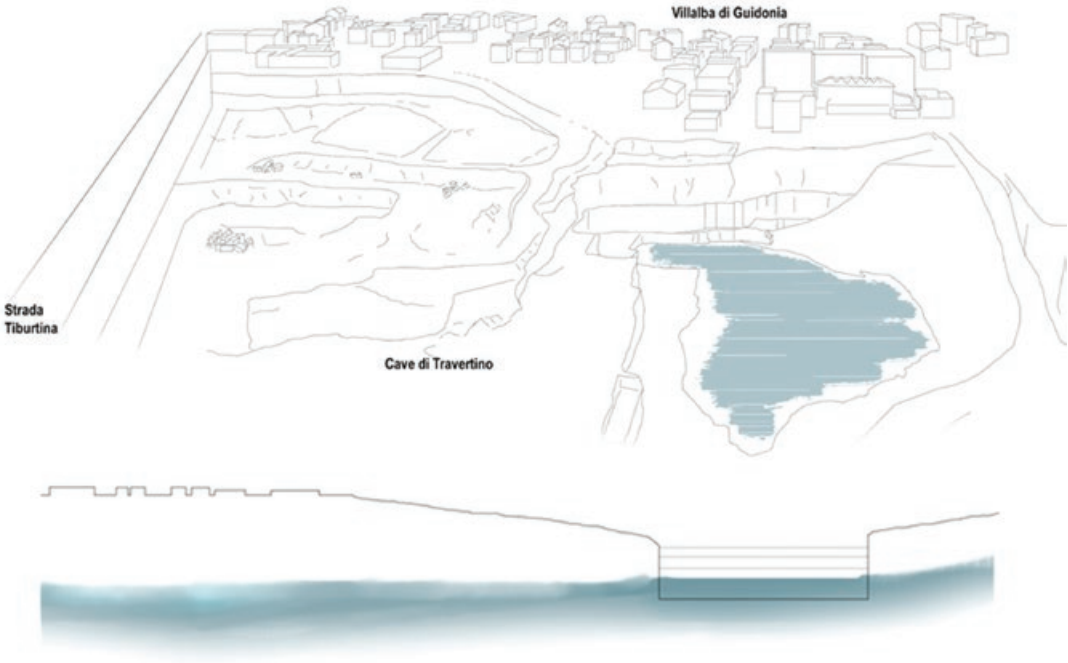
Blue Landscapes: the Aniene River and the Travertine Quarries

The Aniene is the main tributary of the Tiber, formerly called "Teverone", the river originates from the Simbruini mountains, on the border between Lazio and Abruzzo, and extends for 99 km crossing 17 municipalities.

Over the centuries this river has been fed by streams coming above all from the nearby mountains of the Lazio Sub-Apennines, posing a threat to the neighboring inhabitants with its floods.

Figure 2. The scheme depicts the relationship between water – quarries – urban centres.

3. The travertine basin has three times the extension of the Milan quarries and is one tenth of the extraction basin of the Apuan Alps.



In 1305 the first flood of the Aniene river was recorded in the municipality of Tivoli, for which a dam was built in the 15th century[4]. In 1826 Pope Pius VIII commissioned the architect Clemente Folchi to design an alternative solution to better control the floods of the river, the architect conceived the Tunnel of Monte Catillo, consisting of two tunnels dug into the mountain to be able to divert the watercourse. This work gave rise to a new course of the river which, making a jump of over 100 meters, forms today's spectacular Cascata Grande.

In ancient times, the course of the Aniene was also a commercial route, it was in fact a valid alternative to the Via Tiburtina for the transport of travertine, the river was in fact navigable in the section between Ponte Lucano and Rome.

Just along the banks of the Aniene is the oldest quarry in the travertine extraction basin, the Barco quarry, where the homonymous farmhouse stands. In late antiquity the quarry was abandoned; during the Middle Ages it became a marshy area due to the frequent floods of the Aniene itself, but also due to

4. Despite the construction of the dam and other hydraulic engineering works, floods from the river continued to cause damage, and in 1826 a river flood destroyed the dam, which was later repaired.

the presence of numerous sources of the Acque Albulae. From the end of the fifteenth century it was decided to reactivate the quarry, to extract the stone necessary for the construction of Renaissance and Baroque Rome, the bottom was cleaned up, as was the stretch of the Aniene from Ponte Lucano to the Tiber upwards, to make it navigable again.

Once extracted from the quarry, the travertine blocks were slid on poles, along specially created ramps, up to the river bank, where there were large rafts, the transport took place using the river current and / or animal traction along the banks.

In the following centuries, river transport was joined by road transport, on carts pulled by buffaloes or oxen until the end of the 19th century, when the Rome-Tivoli steam tramway was installed (1879) and river transport ceased altogether.

Today this important environmental emergency is hidden by the industrial landscape and welcomes some of the problems deriving from the quarries, since the wastewater from the plants flows into the river, giving the watercourse a white colour.

Near the river, north of the quarries, is the Acque Albulae[5] basin, an emergence of extraordinary landscape and economic importance: the springs are composed of sulphurous mineral waters used since Roman times[6] for their therapeutic properties. Between 1856 and 1863 a commission made up of doctors and archaeologists supported Pope Pius IX's project for the construction of the baths, and the project ended in 1879. However, in the early twenties of the twentieth century, due to the large influx of users, the thermal power plant was expanded.

To date, the thermal establishments of Tivoli represent one of the main polarities of the area despite the adjacent traverine extraction activity affecting the levels of sulphurous water present in the establishments.

Due to the presence of the Acque Albulae springs but above all for those of the Aniene river we can define the territory of the quarries as a landscape characterized by water, a place which without the presence of these important water emergencies would not have become one of the major economic poles. The economy it prevailed over nature and today the Aniene and Acque Albulae are totally imperceptible and inaccessible natural resources.

5. The Latin adjective Albulae, (white) refers to the whitish color of the waters.
6. The exploitation of the sources is maximum in the III century. B.C. and reaches its peak in the second century B.C.

Figure 3. The Aniene river at the margins of the Barco quarry where there is also the ancient Lucano bridge.

Strategies for Valorisation and Recovery of Quarry Landscapes

The extraction of travertine east of Rome has led to a situation of environmental imbalance made up of various problems. In order to understand the consequences of this impact, a scenario visionj[7] has been adopted, which is based on the concept of "what could happen if".

This approach takes note of the presence of active quarries and those being abandoned as well as the possible extension of the excavation over time in order to build possible developments considering the intentions among the various players to try to build the image of a common future.

The production of the scenarios is based on the concept of the territory as a complex system, which also includes the settled society, object of future anthropic actions. This method represents the process of a "conscious construction of a territory", and is based on the process of recognizing the value of the territory and local development (Ferraresi, Rossi Doria 2007).

The introduction of the scenarios is due to the need to try to control the territorial phenomena by prefiguring future arrangements, based on the analysis and knowledge of the state of the places. Sometimes the scenario becomes a revealing tool of little-known phenomena, transforming itself into a means for

7. In economics, the scenario method is a simulation technique, which aims to reproduce the behaviors that arise in certain circumstances, to outline future dynamics. In urban planning this method foresees the possible transformations of the territory "the scenario is a unifying image that interprets the existing in the light of the possible future".

disseminating possible futures, but also of a little-known present (Bisio, Lombardini, Segalerba 2007).

In organizing possible future arrangements, "images" are created which can represent possible escape points from the present, or representations of current trends; o suggested itineraries for the community; o the set of questions and desires of society; or what can be defined as real scenarios, attempts to investigate "what would happen if…" (Secchi 2003).

The application of the aforementioned methodology allows different evolutionary visions of the basin:

- 1st scenario_ Off Limits, in which the continuity of the extraction basin is expected without restoration interventions;
- 2nd scenario_ STOP (Protection of the Territory and Homogeneity of the Landscape) in which the total revegetation of the extraction basin is envisaged.

From the analysis of these two development perspectives, a third scenario was created, RI_CaVa (Regeneration and Enhancement of Quarries), which takes into consideration the continuity of the mining activity and the recovery of abandoned activities, through the creation of a green network that it would allow both to strengthen the connections between the hamlets of Guidonia Villanova and Villaba and to protect and increase the biodiversity of the area with mitigation works.

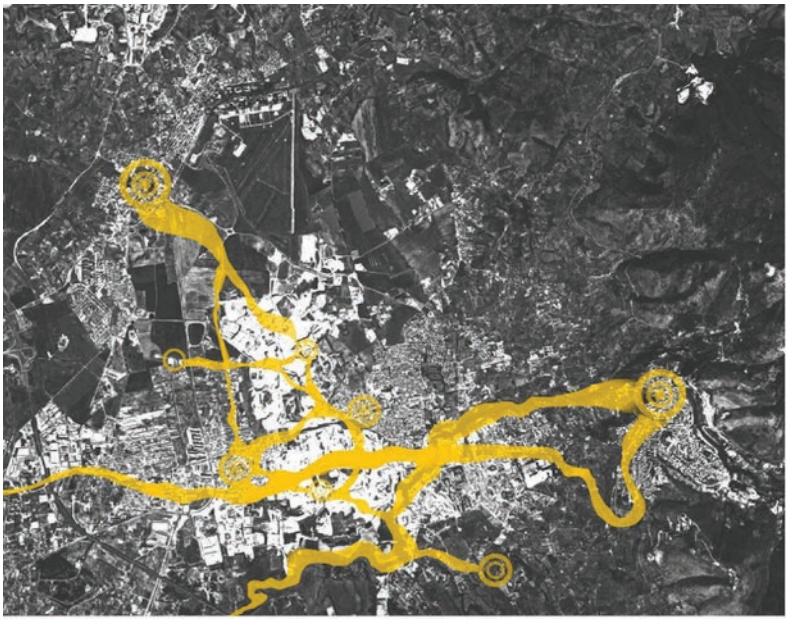
The RI_CaVa project is based on the concept of extractive landscape as an expression of local culture, so that in a recovery plan several interlocutors must necessarily interact, not only those belonging to the public administrations. The fulcrum of the Ri_CaVa project is represented by the creation of a consultation table between Municipalities, the Region, industrialists, research bodies and local associations, to trigger a shared reflection process aimed at developing a recovery plan for the travertine basin.

The Ri_CaVa project proposes both a methodology for the creation of a regeneration plan for abandoned quarries adjacent to active quarries, and a design approach developed for transects in order to implement interventions that respect the context and the historical, cultural and landscape value attributed everywhere.

The subdivision of an area into transects is a methodology used in the natural sciences to survey and census a sample of plant and animal species, to then describe the variations in biodiversity.

Today this methodology finds wide application in urban planning, the first field trials can be referred to Patrick Geddes

Figure 4. Poster of the Ri_CaVa project which has as its objective the environmental and social reconnection of the territory, in which the quarries are the central point.



and his Valley Section[8] which takes into consideration the relationship between nature and the environment.

As in nature, man-made areas can also be divided into transects, to analyze and understand the relationship with the context.

The construction of the transept is based on environmental and social observations at all scales, from local to regional.

The use of the transept therefore constitutes the application of the rules dictated by a large area plan, which in the case of the travertine extraction basin is represented by a scheme of intervention strategies, prepared after the prefiguration of the RI_CaVa project (Regeneration of Quarries and Enhancement).

The transept is used not only as a support for the analysis but also as a design tool, since the landscape of the quarries is a system made up of multiple realities and each intervention can affect the balance of the entire neighboring area.

The margins of the transepts have been identified according

8. In economics, the scenario method is a simulation technique, which aims to reproduce the behaviors that occur The Valley Section (valley section) is transversal and concerns heights and depths, and is a tool that Geddes uses for the analysis of the territory with respect to the context. Geddes in both valley sections represents the mountain from which the river is born which reaches its mouth, located in correspondence with a modern industrial city. No under certain circumstances, to outline future dynamics. In urban planning this method foresees the possible transformations of the territory "the scenario is a unifying image that interprets the existing in the light of the possible future".

to the elements characterizing the territory, dividing them into linear and punctual areas.

In detail, the first transept, or sequence, called Albulae intervenes on a territory in which there are still episodes of agricultural activity, among which the great environmental peculiarity of the Acque Albuale basin stands out to the west.

The second transept, Le Fosse, is influenced by the presence of Bernini's farmhouse, evidence of the use of travertine for large architectural works.

The third transept, Tiburtina, appears to be the most difficult place to intervene on as it is the most urbanized one, and its proximity to via Tiburtina makes it a "door" to the intervention, which is why it must represent the exemplification of the Ri_CaVa project.

The fourth and last transept is bordered to the south by the Aniene river and encloses one of the most representative farmhouses of quarrying activity, the Casale de Barco.

The division of the basin into transects has made it possible to identify the aptitude of each individual area for developing targeted design actions also according to the context, sometimes predominantly anthropic and sometimes predominantly vegetal.

From the analysis of the case study of the travertine quarries of Tivoli and Guidonia Montecelio emerges the need to transform the abandoned quarries, places of possible degradation, into areas of high environmental quality, to give them back to the citizens. It is necessary to take a broad perspective considering abandoned quarries as possible landscapes, as potential bearers of environmental quality.

We welcome landscape changes with a pragmatic vision, which takes into account the socio-economic specificities of the territory and the need for citizenship.

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Waterfront Dialectics.
Rome and its Region Facing Climate Change Impacts
Edited by: Pedro Ressano Garcia, Claudia Mattogno,
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One of the most complex discussions concerning climate emergency is the sustainable water management. How to deal with the risks generated by climate change where the presence of cultural and environmental assets is highly stratified over time?
How to manage large densely populated areas rich in environmental and human resources, ensuring their protection and development?
It's now time to integrate the connections between the different territorial scales and to ensure the balance between public and private interests in a framework of sustainable strategies.
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